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GEODESY

TABLES FOR A POLYCONIC PROJECTION OF MAPS

BASED UPON CLARKE'S REFERENCE SPHEROID OF 1866

FOURTH EDITION

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TABLES FOR THE PROJECTION OF MAPS BASED UPON A POLYCONIC DEVELOPMENT OF CLARKE'S SPHEROID OF 1866, AND COMPUTED FROM THE EQUATOR TO THE POLE.

INTRODUCTION.

These tables were published as Appendix 6 to the Coast and Geodetic Survey Report for 1884, and as Special Publication No. 5 in 1900. The constant demand for the tables has necessitated the present edition, in which the tables remain the same as those in the other editions, while this introductory is only slightly different from that of the second edition.

The tables here given for the construction of maps on the polyconic projection depend upon the dimensions of the spheroid representative of the earth's figure and size as determined by Col. A. R. Clarke, R. E., in 1866 and as expressed by him in meters. Prior to February, 1880, the work of the Survey was developed on Bessel's representative spheriod of 1841, and for which projection tables had been published in the annual reports for 1853, 1856, 1859, and 1865. The first publication, by E. B. Hunt, U. S. A., Assistant in the Survey, is accompanied by an exposition of the method; the second publication, by J. E. Hilgard, Assistant, specially provides for the projecting of maps of large extent, and received some further extension in 1859 and for a special case in 1865. These earlier publications were superseded in consequence of the change of the spheroid of development. The report of the Survey for 1880 contains a paper by C. A. Schott, Assistant, comparing the polyconic with other projections as to their relative practical values, and a special publication of the Survey in 1882, by T. Craig, Ph. D., develops the mathematical principles upon which the various forms of projections depend and exhibits their special properties. The projection tables of 1884 were edited by C. O. Boutelle, Assistant in charge of the Office, and are in a most complete form for use for maps of any scale.*

The two spheroids of reference referred to, with their dimensions expressed in meters, compare as follows:

	According to Bessel (1841).	According to Clarke (1866).
Equatorial radius a	6 377 397·2	6 378 206·4
Polar semi-axis b	6 356 079·0	6 356 583·8
b/a	298·15/299·15	293·98/294·98

Originally the dimensions of the Besselian spheroid were expressed in toises, those of Clarke's spheroid in English standard feet. Their metric equivalents as adopted at the time and here given could not now be considered as representing the best comparisons.† According to Clarke (1866):

The toise equals 76·734 402 inches=1·949 036 32 meters.
The meter equals 39·370 432 inches=3·280 869 33 feet.

whereas we find now the more correct relation to the international meter somewhere between 39.369 87 and 39.370 08 inches;‡ the value 39.369 90 inches is the result by the Weights and Measures Bureau, presented in Appendix No.

* Projection tables for the use of the United States Navy were published by the Bureau of Navigation, Navy Department, Washington, 1869. They are adapted to areas of small and large extent, refer to Bessel's spheroid, and use the metric system. The latest publication of tables on polyconic projection is by the Smithsonian Institution, "Geographical Tables," prepared by R. S. Woodward, Smithsonian Miscellaneous Collections 854, Washington, the third edition of which was published in 1906. Clarke's spheroid of 1866, as expressed in feet, is employed. Coordinates for the projection of maps on several different scales are given in both inches and millimeters. The United States Geological Survey published in 1908 "Geographic Tables and Formulas," compiled by Samuel S. Gannett, Geographer, which contains Polyconic Projection Tables, most of which are extracts from "Geographic Tables" of the Smithsonian Institution and from Appendix 6, Coast and Geodetic Survey Report for 1884.

† Comparisons of standards of lengths, etc., made at the Ordnance Office at Southampton by Capt. A. R. Clarke, London, 1866, p. 287.

‡ Die Europäishe Längengradmessung in 52° Breite. Berlin, 1893, pp. 225–230.

16, Coast and Geodetic Survey Report for 1890, by Assistant O. H. Tittmann, pages 715–720. The legal value in the United States is 39·3700 inches, which is undoubtedly close to the truth. This last relation corresponds to 1 meter = 3·280 833 3 feet and 1 foot = 0·304 800 6 meters.

The statute mile of 5 280 feet equals 1 609·347 meters. The nautical mile, not being a measure of precision unless specially defined, is variously given. Originally and practically for uses at sea it is the length of one minute of arc on the earth's surface for the given latitude and in the given azimuth as computed on a representative spheroid.* In the tables issued by the office of Standard Weights and Measures, September, 1898, the value given is 1 853·25 meters and is defined as a minute of arc of a great circle of a sphere whose surface equals that of the Clarke representative spheroid of 1866. Using Clarke's ratio of foot to meter this length is equal to 6 080·27 feet and is the same as given by Bowditch, United States Naval edition of 1888. With the latest relation of the meter and the foot we get 6 080·20 feet. Accordingly we have 1 statute mile equal to 0·868 392 nautical mile and 1 nautical mile equals 1·151 553 statute miles.

For Clarke's spheroid (1866) and for the middle latitude φ we have the length in meters M° of a degree of the meridian and the length P° of a degree of the parallel by the expressions:

$$M^\circ = 111\ 132{\cdot}09 - 566{\cdot}05 \cos 2\varphi + 1{\cdot}20 \cos 4\varphi - 0{\cdot}003 \cos 6\varphi + \ldots$$
$$P^\circ = 111\ 415{\cdot}10 \cos \varphi - 94{\cdot}54 \cos 3\varphi + 0{\cdot}12 \cos 5\varphi - \ldots$$

The general aspect of a polyconic projection is well shown by the maps of North and Central America, Coast Survey Report for 1865, page 177, and, when extended over the surface of the sphere, by illustration No. 38 in the report of 1859. In this projection every parallel of latitude appears on the map as the developed circumference of the base of a right cone tangent to the spheroid on that parallel; the central meridian appears as a straight line, while all other meridians appear concave toward it; the parallels appear as arcs of circles of different radii, but with their centers on the central line (produced), the equator alone being represented by a straight line, and all parallels have their convexity turned toward it. It will be noticed that near the middle portion of a map or for ordinary limited charts of *large scale* the intersections of the projected meridians and parallels do not differ much from a right angle; developed arcs on the parallels appear in their true length according to scale of map, as also do the differences of latitude on the central meridian; hence for equal differences of longitude the corresponding parts on any parallel are equal, whereas the meridional differences widen out as we recede from the central meridian. For the construction of the net the table provides the values of rectangular coordinates of the intersections of parallels and meridians, which are computed by means of the following formulæ: We have radius of curvature of normal section perpendicular to the meridian (and terminating at the minor axis)

$$\rho_n = a\left(1 - e^2 \sin^2 \varphi\right)^{-\frac{1}{2}} \text{ and } e^2 = \frac{a^2 - b^2}{a^2} = 0{\cdot}006\ 768\ 66$$

Where a = equatorial radius (6 378 206 meters), e = eccentricity, and φ = latitude. The slant height l of the tangent cone is $l = \rho_n \cot \varphi$ and the angle θ at the apex of any developed arc n corresponding to the difference of longitude $\Delta\lambda$ is given by

$$\theta = n \sin \varphi$$

The coordinates x and y of intersection are given by

$$x = l \sin \theta, \text{ which is nearly equivalent to } \rho_n\, n \cos \varphi$$
$$y = 2l \sin^2 \tfrac{1}{2}\theta, \text{ which is nearly equivalent to } \tfrac{1}{2}\rho_n\, n^2 \sin^2 \varphi$$

From what has been said the construction of a polyconic net is very simple, viz: Lay off on the given scale of the map and in its middle part a straight line to represent the central meridian; on it scale off the meridional distances between the several parallels of latitude, and through these points draw perpendiculars to the meridian to serve for the axes of the coordinates x, those of the coordinates y being at right angles thereto. Take the values of x and y from the table. The several successive points of intersection, thus marked, are then united by curved lines. The vertical ones represent the meridians and the others the parallels.

*See Appendix No. 12, Coast and Geodetic Survey Report for 1881, which contains a variety of values for length of a nautical mile according to definitions.

Conversion tables.

Meters into feet.

1 meter =	3.280 833 3 feet.
2	6.561 666 7
3	9.842 500 0
4	13.123 333 3
5	16.404 166 7
6	19.685 000 0
7	22.965 833 3
8	26.246 666 7
9	29.527 500 0

Feet into meters.

1 foot =	0.304 800 6 meters.
2	0.609 601 2
3	0.914 401 8
4	1.219 202 4
5	1.524 003 0
6	1.828 803 7
7	2.133 604 3
8	2.438 404 9
9	2.743 205 5

Meters into yards.

1 meter =	1.093 611 1 yards.
2	2.187 222 2
3	3.280 833 3
4	4.374 444.4
5	5.468 055 6
6	6.561 666 7
7	7.655 277 8
8	8.748 888 9
9	9.842 500 0

Yards into meters.

1 yard =	0.914 401 8 meters.
2	1.828 803 7
3	2.743 205 5
4	3.657 607 3
5	4.572 009 1
6	5.486 411 0
7	6.400 812 8
8	7.315 214 6
9	8.229 616 5

Meters into statute miles.

1 meter =	0.000 621 370 st. miles.
2	1 242 740
3	1 864 110
4	2 485 480
5	3 106 850
6	3 728 220
7	4 349 590
8	4 970 960
9	5 592 330

Statute miles into meters.

1 st. mile =	1 609.35 meters.
2	3 218.69
3	4 828.04
4	6 437.39
5	8 046.74
6	9 656.08
7	11 265.43
8	12 874.78
9	14 484.13

Meters into nautical miles.

1 meter =	0.000 539 593 n miles.
2	1 079 185
3	1 618 778
4	2 158 370
5	2 697 963
6	3 237 556
7	3 777 148
8	4 316 741
9	4 856 333

Nautical miles into meters.

1 n. mile =	1 853.25 meters.
2	3 706.50
3	5 559.75
4	7 413.00
5	9 266.25
6	11 119.50
7	12 972.75
8	14 826.00
9	16 679.25

Nautical miles into statute miles.

1 n. mile =	1.151 553 st. miles.
2	2.303 106
3	3.454 659
4	4.606 212
5	5.757 765
6	6.909 318
7	8.060 871
8	9.212 424
9	10.363 977

Statute miles into nautical miles.

1 st. mile =	0.868 393 n. miles
2	1.736 785
3	2.605 177
4	3.473 570
5	4.341 962
6	5.210 355
7	6.078 747
8	6.947 140
9	7.815 532

LENGTHS OF DEGREES OF THE PARALLEL.

Lat.	Meters.	Yards.	Statute miles.	Nautical miles.	Lat.	Meters.	Yards.	Statute miles.	Nautical miles.	Lat.	Meters.	Yards.	Statute miles.	Nautical miles.
° ′					° ′					° ′				
0 00	111 321	121 742	69.172	60.068	30 00	96 488	105 520	59.956	52.064	60 00	55 802	61 026	34.674	30.110
30	1 316	1 736	9.169	0.065	30	6 001	4 988	9.653	1.801	30	4 958	0 103	4.150	29.654
1 00	1 304	1 723	9.162	0.059	31 00	5 506	4 446	9.345	1.534	61 00	4 110	59 175	3.623	9.197
30	1 283	1 700	9.149	0.047	30	5 004	3 897	9.033	1.264	30	3 257	8 242	3.093	9.737
2 00	1 253	1 668	9.130	0.031	32 00	4 495	3 341	8.716	0.989	62 00	2 400	7 305	2.560	8.275
30	111 215	121 626	69.106	60.011	30	93 979	102 776	58.396	50.710	30	51 540	56 365	32.025	27.811
3 00	1 169	1 576	9.078	59.986	33 00	3 455	2 203	8.071	0.428	63 00	0 675	5 419	1.488	7.344
30	1 114	1 516	9.044	9.956	30	2 925	1 624	7.741	0.142	30	49 806	4 468	0.948	6.875
4 00	1 051	1 447	9.005	9.922	34 00	2 387	1 035	7.407	49.851	64 00	8 934	3 515	0.406	6.404
30	0 980	1 369	8.960	9.884	30	1 842	100 439	7.068	9.557	30	8 057	2 556	29.862	5.931
5 00	110 900	121 281	68.911	59.840	35 00	91 290	99 836	56.725	49.259	65 00	47 177	51 593	29.315	25.456
30	0 812	1 185	8.856	9.793	30	0 731	9 224	6.378	8.958	30	6 294	0 628	8.766	4.979
6 00	0 715	1 079	8.795	9.741	36 00	0 166	8 607	6.027	8.653	66 00	5 407	49 658	8.215	4.501
30	0 610	0 964	8.730	9.684	30	89 593	7 980	5.671	8.344	30	4 516	8 683	7.661	4.021
7 00	0 497	0 841	8.660	9.622	37 00	9 014	7 347	5.311	8.031	67 00	3 622	7 706	7.106	3.538
30	110 375	120 707	68.585	59.557	30	88 428	96 706	54.947	47.715	30	42 724	46 723	26.548	23.053
8 00	0 245	0 565	8.504	9.487	38 00	7 835	6 057	4.579	7.395	68 00	1 823	5 738	5.988	2.567
30	0 106	0 413	8.418	9.412	30	7 235	5 401	4.206	7.071	30	0 919	4 750	5.426	2.079
9 00	109 959	0 252	8.326	9.333	39 00	6 629	4 738	3.829	6.744	69 00	0 012	3 758	4.862	1.590
30	9 804	120 083	8.230	9.249	30	6 016	4 068	3.448	6.413	30	39 102	2 762	4.297	1.099
10 00	109 641	119 905	68.129	59.161	40 00	85 396	93 390	53.063	46.079	70 00	38 188	41 763	23.729	20.606
30	9 469	9 717	8.022	9.068	30	4 770	2 705	2.674	5.741	30	7 272	0 761	3.160	0.112
11 00	9 289	9 520	7.910	8.971	41 00	4 137	2 013	2.281	5.399	71 00	6 353	39 756	2.589	19.616
30	9 101	9 314	7.793	8.870	30	3 498	1 314	1.884	5.054	30	5 431	8 748	2.016	9.118
12 00	8 904	9 099	7.670	8.764	42 00	2 853	90 609	1.483	4.706	72 00	4 506	7 736	1.441	8.619
30	108 699	118 874	67.543	58.653	30	82 201	89 896	51.078	44.355	30	33 578	36 721	20.865	18.119
13 00	8 486	8 641	7.410	8.538	43 00	1 543	9 176	0.669	4.000	73 00	2 648	5 704	0.287	7.617
30	8 265	8 400	7.273	8.419	30	0 879	8 450	0.257	3.642	30	1 716	4 685	19.708	7.114
14 00	8 036	8 149	7.131	8.295	44 00	0 208	7 716	49.840	3.280	74 00	0 781	3 662	9.127	6.609
30	7 798	7 889	6.983	8.167	30	79 532	6 977	9.419	2.915	30	29 843	2 637	8.544	6.103
15 00	107 553	117 621	66.830	58.034	45 00	78 849	86 230	48.995	42.546	75 00	28 903	31 609	17.960	15.596
30	7 299	7 343	6.672	7.897	30	8 160	5 477	8.567	2.175	30	7 961	0 578	7.374	5.088
16 00	7 036	7 056	6.510	7.756	46 00	7 466	4 718	8.136	1.801	76 00	7 017	29 546	6.788	4.578
30	6 766	6 760	6.342	7.610	30	6 765	3 951	7.700	1.423	30	6 071	8 512	6.200	4.067
17 00	6 487	6 455	6.169	7.459	47 00	6 058	3 178	7.261	1.041	77 00	5 123	7 475	5.611	3.556
30	106 201	116 143	65.991	57.305	30	75 346	82 400	46.818	40.656	30	24 172	26 435	15.020	13.043
18 00	5 906	5 820	5.808	7.146	48 00	4 628	1 614	6.372	0.268	78 00	3 220	5 394	4.428	2.529
30	5 604	5 490	5.620	6.983	30	3 904	0 822	5.922	39.877	30	2 266	4 350	3.836	2.014
19 00	5 294	5 151	5.427	6.816	49 00	3 174	0 024	5.469	9.484	79 00	1 311	3 306	3.242	1.499
30	4 975	4 801	5.229	6.644	30	2 439	79 220	5.012	9.088	30	20 353	2 258	2.647	0.983
20 00	104 649	114 445	65.026	56.468	50 00	71 698	78 410	44.552	38.688	80 00	19 394	21 210	12.051	10.465
30	4 314	4 079	4.818	6.287	30	0 952	7 594	4.088	8.285	30	8 434	0 160	1.455	9.947
21 00	3 972	3 705	4.606	6.102	51 00	0 200	6 771	3.621	7.880	81 00	7 472	19 108	0.857	9.428
30	3 622	3 322	4.389	5.913	30	69 443	5 944	3.150	7.472	30	6 509	8 054	10.258	8.908
22 00	3 264	2 931	4.166	5.720	52 00	8 680	5 109	2.676	7.060	82 00	5 545	7 000	9.659	8.388
30	102 898	112 530	63.938	55.523	30	67 913	74 270	42.199	36.646	30	14 579	15 944	9.059	7.867
23 00	2 524	2 121	3.706	5.321	53 00	7 140	3 425	1.719	6.229	83 00	3 612	4 886	8.458	7.345
30	2 143	1 705	3.469	5.115	30	6 361	2 573	1.235	5.809	30	2 644	3 828	7.857	6.823
24 00	1 754	1 279	3.228	4.905	54 00	5 578	1 717	0.749	5.386	84 00	1 675	2 768	7.255	6.300
30	1 357	0 845	2.981	4.691	30	4 790	70 855	40.259	4.960	30	10 706	1 708	6.652	5.776
25 00	100 952	110 402	62.729	54.473	55 00	63 996	69 987	39.766	34.532	85 00	9 735	10 646	6.049	5.253
30	0 539	109 951	2.473	4.250	30	3 198	9 114	9.270	4.101	30	8 764	9 584	5.446	4.729
26 00	0 119	9 491	2.212	4.024	56 00	2 395	8 236	8.771	3.668	86 00	7 792	8 521	4.842	4.205
30	99 692	9 024	1.946	3.793	30	1 587	7 362	8.269	3.232	30	6 819	7 457	4.237	3.680
27 00	9 257	8 549	1.676	3.558	57 00	60 774	6 463	7.764	2.794	87 00	5 846	6 393	3.632	3.154
30	98 814	108 064	61.401	53.319	30	59 957	65 570	37.256	32.353	30	4 872	5 328	3.027	2.629
28 00	8 364	7 572	1.122	3.076	58 00	9 135	4 671	6.745	1.909	88 00	3 898	4 263	2.422	2.103
30	7 906	7 071	0.837	2.829	30	8 309	3 767	6.232	1.463	30	2 924	3 198	1.817	1.578
29 00	7 441	6 563	0.548	2.578	59 00	7 478	2 859	5.716	1.015	89 00	1 949	2 131	1.211	1.052
30	6 968	6 045	60.254	2.323	30	6 642	1 944	5.196	0.564	30	975	1 066	0.606	0.526
30 00	96 488	105 520	59.956	52.064	60 00	55 802	61 026	34.674	30.110	90 00	0	0	0	0

LENGTHS OF DEGREES OF THE MERIDIAN.

Lat.	Meters.*	Yards.	Statute miles.	Nautical miles.	Lat.	Meters.*	Yards.	Statute miles.	Nautical miles.
°					°				
0– 1	110 567.3	120 917.6	68.703	59.661	45–46	111 140.8	121 544.8	69.060	59.971
1– 2	110 568.0	120 918.4	68.704	59.662	46–47	111 160.5	121 566.4	69.072	59.981
2– 3	110 569.4	120 919.9	68.705	59.662	47–48	111 180.2	121 587.9	69.084	59.992
3– 4	110 571.4	120 922.1	68.706	59.664	48–49	111 199.9	121 609.4	69.096	60.003
4– 5	110 574.1	120 925.1	68.707	59.665	49–50	111 219.5	121 630.9	69.108	60.013
5– 6	110 577.6	120 928.9	68.710	59.667	50–51	111 239.0	121 652.2	69.121	60.024
6– 7	110 581.6	120 933.3	68.712	59.669	51–52	111 258.3	121 673.3	69.133	60.034
7– 8	110 586.4	120 938.5	68.715	59.672	52–53	111 277.6	121 694.4	69.145	60.045
8– 9	110 591.8	120 944.4	68.718	59.675	53–54	111 296.6	121 715.2	69.156	60.055
9–10	110 597.8	120 951.0	68.722	59.678	54–55	111 315.4	121 735.8	69.168	60.065
10–11	110 604.5	120 958.3	68.726	59.681	55–56	111 334.0	121 756.1	69.180	60.075
11–12	110 611.9	120 966.4	68.731	59.685	56–57	111 352.4	121 776.2	69.191	60.085
12–13	110 619.8	120 975.0	68.736	59.690	57–58	111 370.5	121 796.0	69.202	60.095
13–14	110 628.4	120 984.4	68.741	59.694	58–59	111 388.4	121 815.6	69.213	60.104
14–15	110 637.6	120 994.5	68.747	59.699	59–60	111 405.9	121 834.7	69.224	60.114
15–16	110 647.5	121 005.3	68.753	59.705	60–61	111 423.1	121 853.5	69.235	60.123
16–17	110 657.8	121 016.6	68.759	59.710	61–62	111 439.9	121 871.9	69.246	60.132
17–18	110 668.8	121 028.6	68.766	59.716	62–63	111 456.4	121 890.0	69.256	60.141
18–19	110 680.4	121 041.3	68.773	59.722	63–64	111 472.4	121 907.5	69.266	60.150
19–20	110 692.4	121 054.4	68.781	59.729	64–65	111 488.1	121 924.6	69.275	60.158
20–21	110 705.1	121 068.3	68.789	59.736	65–66	111 503.3	121 941.2	69.285	60.166
21–22	110 718.2	121 082.7	68.797	59.743	66–67	111 518.0	121 957.3	69.294	60.174
22–23	110 731.8	121 097.5	68.805	59.750	67–68	111 532.3	121 973.0	69.303	60.182
23–24	110 746.0	121 113.1	68.814	59.758	68–69	111 546.2	121 988.2	69.311	60.190
24–25	110 760.6	121 129.0	68.823	59.765	69–70	111 559.5	122 002.7	69.320	60.197
25–26	110 775.6	121 145.4	68.833	59.774	70–71	111 572.2	122 016.6	69.328	60.204
26–27	110 791.1	121 162.4	68.842	59.782	71–72	111 584.5	122 030.0	69.335	60.210
27–28	110 807.0	121 179.8	68.852	59.791	72–73	111 596.2	122 042.8	69.343	60.217
28–29	110 823.3	121 197.6	68.862	59.800	73–74	111 607.3	122 055.0	69.349	60.223
29–30	110 840.0	121 215.9	68.873	59.808	74–75	111 617.9	122 066.6	69.356	60.228
30–31	110 857.0	121 234.4	68.883	59.818	75–76	111 627.8	122 077.4	69.362	60.234
31–32	110 874.4	121 253.5	68.894	59.827	76–77	111 637.1	122 087.6	69.368	60.239
32–33	110 892.1	121 272.8	68.905	59.837	77–78	111 645.9	122 097.2	69.373	60.243
33–34	110 910.1	121 292.5	68.916	59.846	78–79	111 653.9	122 105.9	69.378	60.248
34–35	110 928.3	121 312.4	68.928	59.856	79–80	111 661.4	122 114.1	69.383	60.252
35–36	110 946.9	121 332.8	68.939	59.866	80–81	111 668.2	122 121.6	69.387	60.255
36–37	110 965.6	121 353.2	68.951	59.876	81–82	111 674.4	122 128.4	69.391	60.259
37–38	110 984.5	121 373.9	68.962	59.886	82–83	111 679.9	122 134.4	69.395	60.262
38–39	111 003.7	121 394.9	68.974	59.897	83–84	111 684.7	122 139.6	69.398	60.264
39–40	111 023.0	121 416.0	68.986	59.907	84–85	111 688.9	122 144.2	69.400	60.268
40–41	111 042.4	121 437.2	68.998	59.918	85–86	111 692.3	122 147.9	69.402	60.268
41–42	111 061.9	121 458.5	69.011	59.928	86–87	111 695.1	122 151.0	69.404	60.270
42–43	111 081.6	121 480.1	69.023	59.939	87–88	111 697.2	122 153.3	69.405	60.271
43–44	111 101.3	121 501.6	69.035	59.949	88–89	111 698.6	122 154.8	69.406	60.272
44–45	111 121.0	121 523.2	69.047	59.960	89–90	111 699.3	122 155.6	69.407	60.272

*The quantities in this column are identical with those on the odd-numbered pages in the body of the table at the bottom of the column headed "Continuous sums of minutes."

CONSTRUCTION OF POLYCONIC PROJECTIONS.

Having the location to be covered by a projection, determine the scale and the interval of the projection lines which will be most suitable for the work in hand.

SMALL SCALE PROJECTIONS (1–500,000 AND SMALLER).

Draw a straight line for a central meridian and a construction line (*a b* in the figure) perpendicular thereto, each to be as central to the sheet as the selected interval of latitude and longitude will permit.

On this central meridian and from its intersection with the construction line lay off the extreme intervals of latitude, north and south (mm_2 and mm_4) and subdivide the intervals for each parallel (m_1 and m_3) to be represented, all distances* being taken from the table (p. 7, "Lengths of degrees of the meridian").

Through each of the points (m_1, m_2, m_3, m_4) on the central meridian draw additional construction lines (*cd*, *ef*, *gh*, *if*) perpendicular to the central meridian, and mark off the ordinates (x, x_1, x_2, x_3, x_4, x_5) from the central meridian corresponding to the values* of "X" taken from the table under "Coordinates of curvature" (pp. 11 to 189), for every meridian to be represented.

At the points (x, x_1, x_2, x_3, x_4, x_5) lay off from each of the construction lines the corresponding values* of "Y"† from the table under "Coordinates of curvature" (pp. 11 to 189), in a direction parallel to the central meridian, above the construction lines if north of the equator, to determine points on the meridians and parallels.

Draw curved lines through the points thus determined for the meridians and parallels of the projection.

LARGE SCALE PROJECTIONS (1–10,000 AND LARGER).

The above method can be much simplified in constructing a projection on a large scale. Draw the central meridian and the construction line *a b*, as directed above. On the central meridian lay off the distances* mm_2 and mm_4 taken from the table under "Continuous sums of minutes" for the intervals in minutes between the middle parallel and the extreme parallels to be represented, and through the points m_2 and m_4 draw straight lines *c d* and *e f* parallel to the line *a b*. On the lines *a b*, *c d*, and *e f* lay off the distances* $m\ x_5$, $m_2\ x_5$, and $m_4\ x_5$ on both sides of the central meridian, taking the values from the table under "Arcs of the parallel in meters" corresponding to the latitude of the points m, m_2, and m_4, respectively. Draw straight lines through the points thus determined, x_5, for the extreme meridians.

At the points x_5 on the line *a b* lay off the value* of Y corresponding to the intervals in minutes between the central and the extreme meridians, as given in the table under "Coordinates of curvature," in a direction parallel with the central meridian and above the line, if north of the equator, to determine points in the central parallel. Draw straight lines from these points to the point m for the middle parallel, and from the points of intersection with the extreme meridians lay off distances* on the extreme meridians, above and below, equal to the distances mm_2 and mm_4 to locate points in the extreme parallels.

Subdivide the three meridians and three parallels into parts corresponding to the projection interval and join the corresponding points of subdivision by straight lines to complete the projection.

To construct a projection on an intermediate scale, follow the method given for small projections to the extent required to give the desired accuracy.

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* The lengths of the arcs of the meridians and parallels change when the latitude changes and *all distances* must be taken from the table opposite the latitude of the point in use.

† Approximate method of deriving the values of y intermediate between those shown in the table.

The ratio of any two successive ordinates of curvature, expressed in meters, equals the ratio of the squares of the corresponding abscissæ expressed in minutes or degrees.

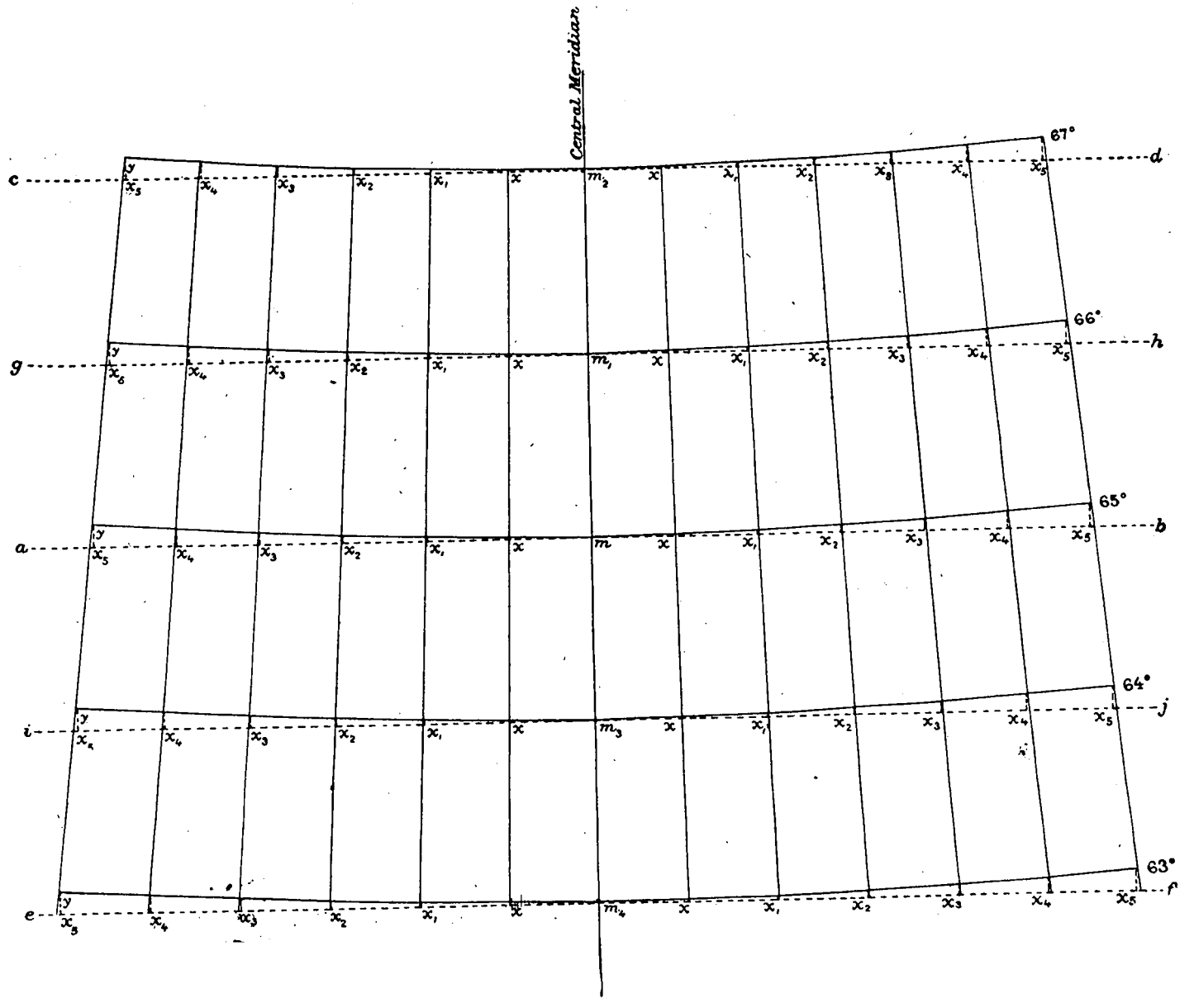
Examples.—Latitude 60° to 61°. Given the value of y for longitude 50′, $292.^{m}8$ (see table), to obtain the value of y for longitude 55′.

$$\frac{(55)^2}{(50)^2}=\frac{y}{292.8};\ \text{hence } y=354.^{m}3 \text{ (see table).}$$

Similarly, y for $3°=3795^{m}$.

$$\frac{4^2}{3^2}=\frac{y}{3795};\ \text{hence } y \text{ for } 4°=6747^{m},$$

which differs 2^{m} from the tabular value, a negligible quantity for the intermediate values of y under most conditions.


Central Meridian
67°
66°
65°
64°
63°
c
d
g
h
a
b
i
j
e
f

Latitude 0° to 1°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
0 00	30.922	61.84	92.77	123.69	154.61	185.53	216.46	247.38	278.30	1855.3	3710.7	5566.0	7421.4	9276.7
1	.922	.84	.77	.69	.61	.53	.46	.38	.30	5.3	0.7	6.0	1.4	6.7
2	.922	.84	.77	.69	.61	.53	.46	.38	.30	5.3	0.7	6.0	1.4	6.7
3	.922	.84	.77	.69	.61	.53	.46	.38	.30	5.3	0.7	6.0	1.4	6.7
4	.922	.84	.77	.69	.61	.53	.46	.38	.30	5.3	0.7	6.0	1.4	6.7
0 05	30.922	61.84	92.77	123.69	154.61	185.53	216.46	247.38	278.30	1855.3	3710.7	5566.0	7421.4	9276.7
6	.922	.84	.77	.69	.61	.53	.46	.38	.30	5.3	0.7	6.0	1.4	6.7
7	.922	.84	.77	.69	.61	.53	.46	.38	.30	5.3	0.7	6.0	1.4	6.7
8	.922	.84	.77	.69	.61	.53	.46	.38	.30	5.3	0.7	6.0	1.4	6.7
9	.922	.84	.77	.69	.61	.53	.46	.38	.30	5.3	0.7	6.0	1.4	6.7
0 10	30.922	61.84	92.77	123.69	154.61	185.53	216.46	247.38	278.30	1855.3	3710.7	5566.0	7421.3	9276.7
11	.922	.84	.77	.69	.61	.53	.46	.38	.30	5.3	0.7	6.0	1.3	6.7
12	.922	.84	.77	.69	.61	.53	.46	.38	.30	5.3	0.7	6.0	1.3	6.7
13	.922	.84	.77	.69	.61	.53	.46	.38	.30	5.3	0.7	6.0	1.3	6.7
14	.922	.84	.77	.69	.61	.53	.46	.38	.30	5.3	0.7	6.0	1.3	6.7
0 15	30.922	61.84	92.77	123.69	154.61	185.53	216.45	247.38	278.30	1855.3	3710.7	5566.0	7421.3	9276.6
16	.922	.84	.77	.69	.61	.53	.45	.38	.30	5.3	0.7	6.0	1.3	6.6
17	.922	.84	.77	.69	.61	.53	.45	.38	.30	5.3	0.6	6.0	1.3	6.6
18	.922	.84	.77	.69	.61	.53	.45	.38	.30	5.3	0.6	6.0	1.3	6.6
19	.922	.84	.77	.69	.61	.53	.45	.38	.30	5.3	0.6	6.0	1.3	6.6
0 20	30.922	61.84	92.77	123.69	154.61	185.53	216.45	247.38	278.30	1855.3	3710.6	5565.9	7421.2	9276.6
21	.922	.84	.77	.69	.61	.53	.45	.37	.30	5.3	0.6	5.9	1.2	6.6
22	.922	.84	.77	.69	.61	.53	.45	.37	.30	5.3	0.6	5.9	1.2	6.5
23	.922	.84	.77	.69	.61	.53	.45	.37	.30	5.3	0.6	5.9	1.2	6.5
24	.922	.84	.77	.69	.61	.53	.45	.37	.30	5.3	0.6	5.9	1.2	6.5
0 25	30.922	61.84	92.76	123.68	154.61	185.53	216.45	247.37	278.30	1855.3	3710.6	5565.9	7421.2	9276.5
26	.922	.84	.76	.68	.61	.53	.45	.37	.29	5.3	0.6	5.9	1.2	6.5
27	.921	.84	.76	.68	.61	.53	.45	.37	.29	5.3	0.6	5.9	1.1	6.4
28	.921	.84	.76	.68	.61	.53	.45	.37	.29	5.3	0.6	5.9	1.1	6.4
29	.921	.84	.76	.68	.61	.53	.45	.37	.29	5.3	0.6	5.8	1.1	6.4
0 30	30.921	61.84	92.76	123.68	154.61	185.53	216.45	247.37	278.29	1855.3	3710.5	5565.8	7421.1	9276.4
31	.921	.84	.76	.68	.61	.53	.45	.37	.29	5.3	0.5	5.8	1.1	6.4
32	.921	.84	.76	.68	.61	.53	.45	.37	.29	5.3	0.5	5.8	1.0	6.3
33	.921	.84	.76	.68	.61	.53	.45	.37	.29	5.3	0.5	5.8	1.0	6.3
34	.921	.84	.76	.68	.60	.53	.45	.37	.29	5.3	0.5	5.8	1.0	6.3
0 35	30.921	61.84	92.76	123.68	154.60	185.52	216.45	247.37	278.29	1855.2	3710.5	5565.7	7421.0	9276.3
36	.921	.84	.76	.68	.60	.52	.44	.37	.29	5.2	0.5	5.7	1.0	6.2
37	.921	.84	.76	.68	.60	.52	.44	.36	.29	5.2	0.5	5.7	1.0	6.2
38	.921	.84	.76	.68	.60	.52	.44	.36	.29	5.2	0.5	5.7	0.9	6.2
39	.920	.84	.76	.68	.60	.52	.44	.36	.28	5.2	0.5	5.7	0.9	6.1
0 40	30.920	61.84	92.76	123.68	154.60	185.52	216.44	247.36	278.28	1855.2	3710.4	5565.7	7420.9	9276.1
41	.920	.84	.76	.68	.60	.52	.44	.36	.28	5.2	0.4	5.6	0.9	6.1
42	.920	.84	.76	.68	.60	.52	.44	.36	.28	5.2	0.4	5.6	0.8	6.0
43	.920	.84	.76	.68	.60	.52	.44	.36	.28	5.2	0.4	5.6	0.8	6.0
44	.920	.84	.76	.68	.60	.52	.44	.36	.28	5.2	0.4	5.6	0.8	6.0
0 45	30.920	61.84	92.76	123.68	154.60	185.52	216.44	247.36	278.28	1855.2	3710.4	5565.6	7420.7	9275.9
46	.920	.84	.76	.68	.60	.52	.44	.36	.28	5.2	0.4	5.5	0.7	5.9
47	.920	.84	.76	.68	.60	.52	.44	.36	.28	5.2	0.3	5.5	0.7	5.9
48	.919	.84	.76	.68	.60	.52	.44	.36	.28	5.2	0.3	5.5	0.7	5.8
49	.919	.84	.76	.68	.60	.52	.44	.35	.27	5.2	0.3	5.5	0.6	5.8
0 50	30.919	61.84	92.76	123.68	154.60	185.51	216.43	247.35	278.27	1855.1	3710.3	5565.4	7420.6	9275.7
51	.919	.84	.76	.68	.60	.51	.43	.35	.27	5.1	0.3	5.4	0.6	5.7
52	.919	.84	.76	.68	.59	.51	.43	.35	.27	5.1	0.3	5.4	0.5	5.7
53	.919	.84	.76	.68	.59	.51	.43	.35	.27	5.1	0.3	5.4	0.5	5.6
54	.919	.84	.76	.67	.59	.51	.43	.35	.27	5.1	0.2	5.4	0.5	5.6
0 55	30.918	61.84	92.76	123.67	154.59	185.51	216.43	247.35	278.27	1855.1	3710.2	5565.3	7420.4	9275.5
56	.918	.84	.75	.67	.59	.51	.43	.35	.27	5.1	0.2	5.3	0.4	5.5
57	.918	.84	.75	.67	.59	.51	.43	.35	.26	5.1	0.2	5.3	0.4	5.5
58	.918	.84	.75	.67	.59	.51	.43	.34	.26	5.1	0.2	5.2	0.3	5.4
59	.918	.84	.75	.67	.59	.51	.43	.34	.26	5.1	0.1	5.2	0.3	5.4
0 60	30.918	61.84	92.75	123.67	154.59	185.51	216.42	247.34	278.26	1855.1	3710.1	5565.2	7420.3	9275.3

Lat.	Latitude 0° to 1°—Meridional arcs.						Latitude 0°—Co-ordinates of curvature.		
	Value of 1″	Sums of seconds for middle latitude 0° 30′		Value of 1′	Continuous sums of minutes from latitude 0° 00′		Longitude.	X	Y
° ′	*Meters.*	″	*Meters.*	*Meters.*	′	*Meters.*	° ′	*Meters.*	*Meters.*
0 00	30.713								
1	3	1	30.71	1842.79	1	1 842.8	0 1	1 855.3	0.0
2	3	2	61.43	.79	2	3 685.6	2	3 710.7	
3	3	3	92.14	.79	3	5 528.4	3	5 566.0	
4	3	4	122.85	.79	4	7 371.1	4	7 421.4	
0 05	30.713	5	153.56	1842.79	5	9 213.9	0 5	9 276.7	0.0
6	3	6	184.28	.79	6	11 056.7	6	11 132.1	
7	3	7	214.99	.79	7	12 899.5	7	12 987.4	
8	3	8	245.70	.79	8	14 742.3	8	14 842.8	
9	3	9	276.42	.79	9	16 585.1	9	16 698.1	
0 10	30.713	10	307.13	1842.79	10	18 427.9	0 10	18 553.4	0.0
11	3	1	337.84	.79	1	20 270.7	15	27 830.2	
12	3	2	368.56	.79	2	22 113.4	20	37 106.9	
13	3	3	399.27	.79	3	23 956.2	25	46 383.6	
14	3	4	429.98	.79	4	25 799.0	30	55 660.3	
0 15	30.713	15	460.69	1842.79	15	27 641.8	0 35	64 937.1	0.0
16	3	6	491.41	.79	6	29 484.6	40	74 213.8	
17	3	7	522.12	.79	7	31 327.4	45	83 490.5	
18	3	8	552.83	.79	8	33 170.2	50	92 767.2	
19	3	9	583.55	.79	9	35 013.0	55	102 044.0	
0 20	30.713	20	614.26	1842.79	20	36 855.8	1 00	111 320.7	0.0
21	3	1	644.97	.79	1	38 698.5	05	120 597.4	
22	3	2	675.69	.79	2	40 541.3	10	129 874.1	
23	3	3	706.40	.79	3	42 384.1	15	139 150.9	
24	3	4	737.11	.79	4	44 226.9	20	148 427.6	
0 25	30.713	25	767.82	1842.79	25	46 069.7	1 25	157 704.3	0.0
26	3	6	798.54	.79	6	47 912.5	30	166 981.0	
27	3	7	829.25	.79	7	49 755.3	35	176 257.8	
28	3	8	859.96	.79	8	51 598.1	40	185 534.5	
29	3	9	890.68	.79	9	53 440.9	45	194 811.2	
0 30	30.713	30	921.39	1842.79	30	55 283.6	1 50	204 087.9	0.0
31	3	1	952.10	.79	1	57 126.4	55	213 364.7	
32	3	2	982.82	.79	2	58 969.2	2 00	222 641	
33	3	3	1 013.53	.79	3	60 812.0	3 00	333 962	
34	3	4	1 044.24	.79	4	62 654.8	4 00	445 283	
0 35	30.713	35	1 074.95	1842.79	35	64 497.6	5 00	556 603	0.0
36	3	6	1 105.67	.79	6	66 340.4	6 00	667 924	
37	3	7	1 136.38	.79	7	68 183.2	7 00	779 245	
38	3	8	1 167.09	.79	8	70 026.0	8 00	890 566	
39	3	9	1 197.81	.79	9	71 868.7	9 00	1 001 886	
0 40	30.713	40	1 228.52	1842.79	40	73 711.5	10 00	1 113 207	0.0
41	3	1	1 259.23	.79	1	75 554.3	11 00	1 224 528	
42	3	2	1 289.95	.79	2	77 397.1	12 00	1 335 848	
43	3	3	1 320.66	.79	3	79 239.9	13 00	1 447 169	
44	3	4	1 351.37	.79	4	81 082.7	14 00	1 558 490	
0 45	30.713	45	1 382.08	1842.79	45	82 925.5	15 00	1 669 810	0.0
46	3	6	1 412.80	.79	6	84 768.3	16 00	1 781 131	
47	3	7	1 443.51	.79	7	86 611.0	17 00	1 892 452	
48	3	8	1 474.22	.79	8	88 453.8	18 00	2 003 772	
49	3	9	1 504.94	.79	9	90 296.6	19 00	2 115 093	
0 50	30.713	50	1 535.65	1842.79	50	92 139.4	20 00	2 226 414	0.0
51	3	1	1 566.36	.79	1	93 982.2	21 00	2 337 735	
52	3	2	1 597.08	.79	2	95 825.0	22 00	2 449 055	
53	3	3	1 627.79	.79	3	97 667.8	23 00	2 560 376	
54	3	4	1 658.50	.79	4	99 510.6	24 00	2 671 697	
0 55	30.713	55	1 689.21	1842.79	55	101 353.4	25 00	2 783 017	0.0
56	3	6	1 719.93	.79	6	103 196.2	26 00	2 894 338	
57	3	7	1 750.64	.79	7	105 038.9	27 00	3 005 659	
58	3	8	1 781.35	.79	8	106 881.7	28 00	3 116 979	
59	3	9	1 812.07	.79	9	108 724.5	29 00	3 228 300	
0 60	30.713	60	1 842.79	1842.79	60	110 567.3	30 00	3 339 621	0.0

Latitude 1° to 2°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
1 00	30.918	61.84	92.75	123.67	154.59	185.51	216.42	247.34	278.26	1855.1	3710.1	5565.2	7420.3	9275.3
1	.918	.84	.75	.67	.59	.51	.42	.34	.26	5.1	0.1	5.2	0.2	5.3
2	.917	.83	.75	.67	.59	.50	.42	.34	.26	5.0	0.1	5.1	0.2	5.2
3	.917	.83	.75	.67	.59	.50	.42	.34	.26	5.0	0.1	5.1	0.1	5.2
4	.917	.83	.75	.67	.59	.50	.42	.34	.25	5.0	0.0	5.1	0.1	5.1
1 05	30.917	61.83	92.75	123.67	154.58	185.50	216.42	247.34	278.25	1855.0	3710.0	5565.0	7420.1	9275.1
6	.917	.83	.75	.67	.58	.50	.42	.33	.25	5.0	0.0	5.0	0.0	5.0
7	.917	.83	.75	.67	.58	.50	.42	.33	.25	5.0	0.0	5.0	0.0	5.0
8	.916	.83	.75	.67	.58	.50	.41	.33	.25	5.0	10.0	5.0	19.9	4.9
9	.916	.83	.75	.66	.58	.50	.41	.33	.24	5.0	9.9	4.9	9.9	4.9
1 10	30.916	61.83	92.75	123.66	154.58	185.50	216.41	247.33	278.24	1855.0	3709.9	5564.9	7419.9	9274.8
11	.916	.83	.75	.66	.58	.50	.41	.33	.24	5.0	9.9	4.9	9.8	4.8
12	.916	.83	.75	.66	.58	.49	.41	.33	.24	4.9	9.9	4.8	9.8	4.7
13	.915	.83	.75	.66	.58	.49	.41	.32	.24	4.9	9.8	4.8	9.7	4.6
14	.915	.83	.75	.66	.58	.49	.41	.32	.24	4.9	9.8	4.8	9.7	4.6
1 15	30.915	61.83	92.75	123.66	154.58	185.49	216.41	247.32	278.24	1854.9	3709.8	5564.7	7419.6	9274.5
16	.915	.83	.74	.66	.57	.49	.40	.32	.23	4.9	9.8	4.7	9.6	4.5
17	.915	.83	.74	.66	.57	.49	.40	.32	.23	4.9	9.8	4.6	9.5	4.4
18	.915	.83	.74	.66	.57	.49	.40	.32	.23	4.9	9.7	4.6	9.5	4.4
19	.914	.83	.74	.66	.57	.49	.40	.31	.23	4.9	9.7	4.6	9.4	4.3
1 20	30.914	61.83	92.74	123.66	154.57	185.48	216.40	247.31	278.23	1854.8	3709.7	5564.5	7419.4	9274.2
21	.914	.83	.74	.66	.57	.48	.40	.31	.23	4.8	9.7	4.5	9.3	4.2
22	.914	.83	.74	.65	.57	.48	.40	.31	.22	4.8	9.6	4.5	9.3	4.1
23	.913	.83	.74	.65	.57	.48	.39	.31	.22	4.8	9.6	4.4	9.2	4.0
24	.913	.83	.74	.65	.57	.48	.39	.31	.22	4.8	9.6	4.4	9.2	4.0
1 25	30.913	61.83	92.74	123.65	154.57	185.48	216.39	247.30	278.22	1854.8	3709.6	5564.3	7419.1	9273.9
26	.913	.83	.74	.65	.56	.48	.39	.30	.22	4.8	9.5	4.3	9.1	3.8
27	.913	.83	.74	.65	.56	.48	.39	.30	.21	4.8	9.5	4.3	9.0	3.8
28	.912	.82	.74	.65	.56	.47	.39	.30	.21	4.7	9.5	4.2	9.0	3.7
29	.912	.82	.74	.65	.56	.47	.38	.30	.21	4.7	9.5	4.2	8.9	3.6
1 30	30.912	61.82	92.74	123.65	154.56	185.47	216.38	247.30	278.21	1854.7	3709.4	5564.1	7418.9	9273.6
31	.912	.82	.73	.65	.56	.47	.38	.29	.20	4.7	9.4	4.1	8.8	3.5
32	.911	.82	.73	.65	.56	.47	.38	.29	.20	4.7	9.4	4.1	8.8	3.4
33	.911	.82	.73	.64	.56	.47	.38	.29	.20	4.7	9.3	4.0	8.7	3.4
34	.911	.82	.73	.64	.55	.47	.38	.29	.20	4.7	9.3	4.0	8.6	3.3
1 35	30.911	61.82	92.73	123.64	154.55	185.46	216.37	247.29	278.20	1854.6	3709.3	5563.9	7418.6	9273.2
36	.910	.82	.73	.64	.55	.46	.37	.28	.19	4.6	9.2	3.9	8.5	3.1
37	.910	.82	.73	.64	.55	.46	.37	.28	.19	4.6	9.2	3.8	8.4	3.1
38	.910	.82	.73	.64	.55	.46	.37	.28	.19	4.6	9.2	3.8	8.4	3.0
39	.910	.82	.73	.64	.55	.46	.37	.28	.19	4.6	9.2	3.7	8.3	2.9
1 40	30.909	61.82	92.73	123.64	154.55	185.46	216.37	247.28	278.18	1854.6	3709.1	5563.7	7418.3	9272.8
41	.909	.82	.73	.64	.55	.45	.36	.27	.18	4.5	9.1	3.6	8.2	2.7
42	.909	.82	.73	.64	.54	.45	.36	.27	.18	4.5	9.0	3.6	8.1	2.7
43	.909	.82	.73	.63	.54	.45	.36	.27	.18	4.5	9.0	3.6	8.1	2.6
44	.908	.82	.73	.63	.54	.45	.36	.27	.18	4.5	9.0	3.5	8.0	2.5
1 45	30.908	61.82	92.72	123.63	154.54	185.45	216.36	247.26	278.17	1854.5	3708.9	5563.5	7417.9	9272.4
46	.908	.82	.72	.63	.54	.45	.35	.26	.17	4.5	8.9	3.4	7.9	2.3
47	.908	.82	.72	.63	.54	.45	.35	.26	.17	4.5	8.9	3.4	7.8	2.3
48	.907	.81	.72	.63	.54	.44	.35	.26	.17	4.4	8.9	3.3	7.7	2.2
49	.907	.81	.72	.63	.53	.44	.35	.26	.16	4.4	8.8	3.3	7.7	2.1
1 50	30.907	61.81	92.72	123.63	154.53	185.44	216.35	247.25	278.16	1854.4	3708.8	5563.2	7417.6	9272.0
51	.906	.81	.72	.63	.53	.44	.34	.25	.16	4.4	8.8	3.1	7.5	1.9
52	.906	.81	.72	.62	.53	.44	.34	.25	.15	4.4	8.7	3.1	7.4	1.8
53	.906	.81	.72	.62	.53	.43	.34	.25	.15	4.3	8.7	3.0	7.4	1.7
54	.906	.81	.72	.62	.53	.43	.34	.24	.15	4.3	8.7	3.0	7.3	1.7
1 55	30.905	61.81	92.72	123.62	154.53	185.43	216.34	247.24	278.15	1854.3	3708.6	5562.9	7417.3	9271.6
56	.905	.81	.71	.62	.52	.43	.33	.24	.14	4.3	8.6	2.9	7.2	1.5
57	.905	.81	.71	.62	.52	.43	.33	.24	.14	4.3	8.5	2.8	7.1	1.4
58	.904	.81	.71	.62	.52	.43	.33	.23	.14	4.3	8.5	2.8	7.0	1.3
59	.904	.81	.71	.62	.52	.42	.33	.23	.14	4.2	8.5	2.7	7.0	1.2
1 60	30.904	61.81	92.71	123.61	154.52	185.42	216.33	247.23	278.13	1854.2	3708.4	5562.7	7416.9	9271.1

Lat.	Latitude 1° to 2°—Meridional arcs.						Latitude 1°—Co-ordinates of curvature.		
	Value of 1″	Sums of seconds for middle latitude 1° 30′		Value of 1′	Continuous sums of minutes from latitude 1° 00′		Longitude.	X	Y
° ′	*Meters.*	″	*Meters.*	*Meters.*	′	*Meters.*	° ′	*Meters.*	*Meters*
1 00	30.713			1842.79					
1	3	1	30.71	.79	1	1 842.8	0 1	1 855.1	0.0
2	3	2	61.43	.79	2	3 685.6	2	3 710.1	0.0
3	3	3	92.14	.79	3	5 528.4	3	5 565.2	0.0
4	3	4	122.85	.79	4	7 371.2	4	7 420.3	0.1
1 05	30.713	5	153.57	1842.79	5	9 214.0	0 5	9 275.3	0.1
6	3	6	184.28	.79	6	11 056.8	6	11 130.4	0.2
7	3	7	215.00	.79	7	12 899.6	7	12 985.4	0.2
8	3	8	245.71	.79	8	14 742.3	8	14 840.5	0.3
9	3	9	276.42	.79	9	16 585.1	9	16 695.6	0.4
1 10	30.713	10	307.14	1842.79	10	18 427.9	0 10	18 550.6	0.5
11	3	1	337.85	.79	11	20 270.7	15	27 826.0	1.1
12	3	2	368.56	.80	12	22 113.5	20	37 101.3	1.9
13	3	3	399.28	.80	13	23 956.3	25	46 376.6	2.9
14	3	4	429.99	.80	14	25 799.1	30	55 651.9	4.2
1 15	30.713	15	460.70	1842.80	15	27 641.9	0 35	64 927.2	5.8
16	3	6	491.42	.80	16	29 484.7	40	74 202.5	7.5
17	3	7	522.13	.80	17	31 327.5	45	83 477.8	9.5
18	3	8	552.84	.80	18	33 170.3	50	92 753.2	11.7
19	3	9	583.56	.80	19	35 013.1	55	102 028.5	14.2
1 20	30.713	20	614.27	1842.80	20	36 855.9	1 00	111 303.7	16.9
21	3	1	644.98	.80	21	38 698.7	05	120 579.0	19.9
22	3	2	675.70	.80	22	40 541.5	10	129 854.3	23.0
23	3	3	706.41	.80	23	42 384.3	15	139 129.6	26.4
24	3	4	737.12	.80	24	44 227.1	20	148 404.9	30.1
1 25	30.713	25	767.84	1842.80	25	46 069.9	1 25	157 680.2	34.0
26	3	6	798.55	.80	26	47 912.7	30	166 955.5	38.1
27	3	7	829.26	.80	27	49 755.5	35	176 230.8	42.4
28	3	8	859.98	.80	28	51 598.3	40	185 506.1	47.0
29	3	9	890.69	.80	29	53 441.1	45	194 781.4	51.8
1 30	30.713	30	921.40	1842.80	30	55 283.9	1 50	204 056.7	56.9
31	3	1	952.12	.80	31	57 126.7	55	213 331.9	62.2
32	3	2	982.83	.80	32	58 969.5	2 00	222 607	68
33	3	3	1 013.54	.80	33	60 812.3	3 00	333 911	153
34	3	4	1 044.26	.80	34	62 655.1	4 00	445 214	271
1 35	30.713	35	1 074.97	1842.80	35	64 497.9	5 00	556 518	424
36	3	6	1 105.68	.80	36	66 340.7	6 00	667 822	610
37	3	7	1 136.40	.80	37	68 183.5	7 00	779 126	831
38	3	8	1 167.11	.80	38	70 026.3	8 00	890 429	1 085
39	3	9	1 197.82	.80	39	71 869.1	9 00	1 001 733	1 373
1 40	30.713	40	1 228.54	1842.80	40	73 711.9	10 00	1 113 037	1 695
41	3	1	1 259.25	.80	41	75 554.7	11 00	1 224 340	2 051
42	3	2	1 289.96	.80	42	77 397.5	12 00	1 335 643	2 441
43	3	3	1 320.68	.80	43	79 240.3	13 00	1 446 946	2 865
44	3	4	1 351.39	.81	44	81 083.1	14 00	1 558 249	3 323
1 45	30.713	45	1 382.10	1842.81	45	82 925.9	15 00	1 669 551	3 814
46	3	6	1 412.82	.81	46	84 768.7	16 00	1 780 854	4 340
47	3	7	1 443.53	.81	47	86 611.5	17 00	1 892 157	4 899
48	3	8	1 474.24	.81	48	88 454.3	18 00	2 003 459	5 492
49	3	9	1 504.96	.81	49	90 297.1	19 00	2 114 761	6 120
1 50	30.713	50	1 535.67	1842.81	50	92 139.9	20 00	2 226 063	6 781
51	3	1	1 566.38	.81	51	93 982.7	21 00	2 337 364	7 476
52	3	2	1 597.10	.81	52	95 825.6	22 00	2 448 666	8 205
53	3	3	1 627.81	.81	53	97 668.4	23 00	2 559 967	8 967
54	3	4	1 658.52	.81	54	99 511.2	24 00	2 671 268	9 764
1 55	30.713	55	1 689.23	1842.81	55	101 354.0	25 00	2 782 569	10 595
56	3	6	1 719.95	.81	56	103 196.8	26 00	2 893 869	11 459
57	3	7	1 750.66	.81	57	105 039.6	27 00	3 005 170	12 358
58	3	8	1 781.37	.81	58	106 882.4	28 00	3 116 470	13 290
59	3	9	1 812.09	.81	59	108 725.2	29 00	3 227 770	14 256
1 60	30.713	60	1 842.80	1842.81	60	110 568.0	30 00	3 339 070	15 256

Latitude 2° to 3°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
2 00	30.904	61.81	92.71	123.61	154.52	185.42	216.33	247.23	278.13	1854.2	3708.4	5562.7	7416.9	9271.1
1	.903	.81	.71	.61	.52	.42	.33	.23	.13	4.2	8.4	2.6	6.8	1.0
2	.903	.81	.71	.61	.52	.42	.32	.22	.12	4.2	8.3	2.6	6.7	0.9
3	.903	.81	.71	.61	.51	.41	.32	.22	.12	4.1	8.3	2.5	6.7	0.8
4	.902	.81	.71	.61	.51	.41	.32	.22	.12	4.1	8.2	2.5	6.6	0.7
2 05	30.902	61.81	92.71	123.61	154.51	185.41	216.31	247.21	278.11	1854.1	3708.2	5562.4	7416.5	9270.6
6	.902	.80	.70	.60	.51	.41	.31	.21	.11	4.1	8.2	2.3	6.4	0.5
7	.901	.80	.70	.60	.51	.41	.31	.21	.11	4.1	8.2	2.3	6.3	0.4
8	.901	.80	.70	.60	.50	.40	.31	.21	.11	4.0	8.1	2.2	6.3	0.3
9	.901	.80	.70	.60	.50	.40	.30	.20	.10	4.0	8.1	2.2	6.2	0.2
2 10	30.900	61.80	92.70	123.60	154.50	185.40	216.30	247.20	278.10	1854.0	3708.1	5562.1	7416.1	9270.1
11	.900	.80	.70	.60	.50	.40	.30	.20	.10	4.0	8.0	2.0	6.0	70.0
12	.900	.80	.70	.60	.50	.40	.30	.20	.09	4.0	8.0	2.0	5.9	69.9
13	.899	.80	.70	.60	.50	.39	.29	.19	.09	3.9	7.9	1.9	5.9	9.8
14	.899	.80	.70	.60	.50	.39	.29	.19	.09	3.9	7.9	1.9	5.8	9.7
2 15	30-899	61.80	92.70	123.60	154.50	185.39	216.29	247.19	278.08	1853.9	3707.8	5561.8	7415.7	9269.6
16	.898	.79	.69	.59	.49	.39	.29	.19	.08	3.9	7.8	1.7	5.6	9.5
17	.898	.79	.69	.59	.49	.39	.29	.19	.08	3.9	7.7	1.7	5.5	9.4
18	.898	.79	.69	.59	.49	.38	.28	.18	.08	3.8	7.7	1.6	5.5	9.3
19	.897	.79	.69	.59	.49	.38	.28	.18	.07	3.8	7.6	1.6	5.4	9.2
2 20	30.897	61.79	92.69	123.59	154.49	185.38	216.28	247.18	278.07	1853.8	3707.6	5561.5	7415.3	9269.1
21	.897	.79	.69	.59	.49	.38	.28	.18	.07	3.8	7.6	1.4	5.2	9.0
22	.896	.79	.69	.59	.49	.38	.27	.17	.06	3.8	7.5	1.3	5.1	8.9
23	.896	.79	.69	.58	.48	.37	.27	.17	.06	3.7	7.5	1.3	5.0	8.7
24	.895	.79	.69	.58	.48	.37	.27	.17	.06	3.7	7.4	1.2	4.9	8.6
2 25	30.895	61.79	92.69	123.58	154.48	185.37	216.26	247.16	278.05	1853.7	3707.4	5561.1	7414.8	9268.5
26	.895	.79	.68	.58	.48	.37	.26	.16	.05	3.7	7.4	1.0	4.7	8.4
27	.894	.79	.68	.58	.48	.37	.26	.16	.05	3.7	7.3	1.0	4.6	8.3
28	.894	.79	.68	.57	.47	.36	.26	.16	.05	3.6	7.3	0.9	4.6	8.2
29	.894	.79	.68	.57	.47	.36	.25	.15	.04	3.6	7.2	0.9	4.5	8.1
2 30	30.893	61.79	92.68	123.57	154.47	185.36	216.25	247.15	278.04	1853.6	3707.2	5560.8	7414.4	9268.0
31	.893	.79	.68	.57	.47	.36	.25	.15	.04	3.6	7.1	0.7	4.3	7.9
32	.892	.79	.68	.57	.47	.35	.24	.14	.03	3.5	7.1	0.6	4.2	7.7
33	.892	.79	.68	.57	.46	.35	.24	.14	.03	3.5	7.0	0.6	4.0	7.6
34	.891	.79	.67	.57	.46	.35	.24	.13	.02	3.5	7.0	0.5	3.9	7.4
2 35	30.891	61.79	92.67	123.57	154.46	185.35	216.23	247.13	278.02	1853.5	3706.9	5560.4	7413.8	9267.3
36	.891	.78	.67	.56	.46	.34	.23	.13	.02	3.4	6.9	0.3	3.7	7.2
37	.890	.78	.67	.56	.46	.34	.23	.12	.01	3.4	6.8	0.2	3.6	7.1
38	.890	.78	.67	.56	.45	.34	.23	.12	.01	3.4	6.8	0.2	3.6	6.9
39	.889	.78	.67	.56	.45	.33	.22	.11	.00	3.3	6.7	0.1	3.5	6.8
2 40	30.889	61.78	92.67	123.56	154.45	185.33	216.22	247.11	278.00	1853.3	3706.7	5560.0	7413.4	9266.7
41	.889	.78	.67	.56	.45	.33	.22	.11	8.00	3.3	6.6	59.9	3.3	6.6
42	.888	.78	.67	.56	.44	.33	.21	.10	7.99	3.3	6.6	9.8	3.2	6.5
43	.888	.78	.66	.55	.44	.32	.21	.10	.99	3.2	6.5	9.8	3.0	6.3
44	.887	.78	.66	.55	.44	.32	.21	.10	.98	3.2	6.5	9.7	2.9	6.2
2 45	30.887	61.78	92.66	123.55	154.43	185.32	216.20	247.09	277.98	1853.2	3706.4	5559.6	7412.8	9266.1
46	.887	.77	.66	.55	.43	.32	.20	.09	.98	3.2	6.4	9.5	2.7	6.0
47	.886	.77	.66	.55	.43	.32	.20	.09	.97	3.2	6.3	9.5	2.6	5.9
48	.886	.77	.66	.54	.43	.31	.20	.09	.97	3.1	6.3	9.4	2.6	5.7
49	.885	.77	.66	.54	.42	.31	.19	.08	.96	3.1	6.2	9.4	2.5	5.6
2 50	30.885	61.77	92.65	123.54	154.42	185.31	216.19	247.08	277.96	1853.1	3706.2	5559.3	7412.4	9265.5
51	.884	.77	.65	.54	.42	.31	.19	.08	.96	3.1	6.1	9.2	2.3	5.3
52	.884	.77	.65	.54	.42	.31	.18	.07	.95	3.0	6.1	9.1	2.2	5.2
53	.883	.77	.65	.53	.41	.30	.18	.07	.95	3.0	6.0	9.1	2.0	5.0
54	.883	.77	.65	.53	.41	.30	.18	.06	.94	3.0	6.0	9.0	1.9	4.9
2 55	30.882	61.77	92.65	123.53	154.41	185.29	216.17	247.06	277.94	1852.9	3705.9	5558.9	7411.8	9264.7
56	.882	.76	.65	.53	.41	.29	.17	.06	.94	2.9	5.8	8.8	1.7	4.6
57	.882	.76	.64	.53	.41	.29	.17	.05	.93	2.9	5.8	8.7	1.6	4.5
58	.881	.76	.64	.52	.40	.29	.17	.05	.93	2.9	5.7	8.7	1.5	4.3
59	.881	.76	.64	.52	.40	.28	.16	.04	.92	2.8	5.7	8.6	1.4	4.2
2 60	30.880	61.76	92.64	123.52	154.40	185.28	216.16	247.04	277.92	1852.8	3705.6	5558.5	7411.3	9264.1

Lat.		Latitude 2° to 3°—Meridional arcs.						Latitude 2°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 2° 30′		Value of 1′	Continuous sums of minutes from latitude 2° 00′		Longitude.	X	Y
°	′	*Meters.*	″	*Meters.*	*Meters.*	′	*Meters.*	° ′	*Meters.*	*Meters.*
2	00	30.714			1842.81					
	1	4	1	30.71	.81	1	1 842.8	0 1	1 854.2	
	2	4	2	61.43	.81	2	3 685.6	2	3 708.4	
	3	4	3	92.14	.81	3	5 528.4	3	5 562.7	0.1
	4	4	4	122.86	.81	4	7 371.2	4	7 416.9	0.2
2	5	30.714	5	153.57	1842.81	5	9 214.1	0 5	9 271.1	0.2
	6	4	6	184.28	.81	6	11 056.9	6	11 125.3	0.3
	7	4	7	215.00	.81	7	12 899.7	7	12 979.6	0.5
	8	4	8	245.71	.81	8	14 742.5	8	14 833.8	0.6
	9	4	9	276.43	.81	9	16 585.3	9	16 688.0	0.8
2	10	30.714	10	307.14	1842.81	10	18 428.1	0 10	18 542.2	0.9
	11	4	1	337.85	.81	1	20 270.9	15	27 813.3	2.1
	12	4	2	368.57	.81	2	22 113.8	20	37 084.4	3.8
	13	4	3	399.28	.81	3	23 956.6	25	46 355.6	5.9
	14	4	4	430.00	.81	4	25 799.4	30	55 626.7	8.5
2	15	30.714	15	460.71	1842.82	15	27 642.2	0 35	64 897.8	11.5
	16	4	6	491.42	.82	6	29 485.0	40	74 168.9	15.0
	17	4	7	522.14	.82	7	31 327.8	45	83 440.0	19.0
	18	4	8	552.85	.82	8	33 170.7	50	92 711.1	23.5
	19	4	9	583.57	.82	9	35 013.5	55	101 982.2	28.4
2	20	30.714	20	614.28	1842.82	20	36 856.3	1 00	111 253.4	33.9
	21	4	1	644.99	.82	1	38 699.1	05	120 524.5	39.8
	22	4	2	675.71	.82	2	40 541.9	10	129 795.6	46.1
	23	4	3	706.42	.82	3	42 384.8	15	139 066.7	52.9
	24	4	4	737.14	.82	4	44 227.6	20	148 337.8	60.2
2	25	30.714	25	767.85	1842.82	25	46 070.4	1 25	157 608.9	68.0
	26	4	6	798.56	.82	6	47 913.2	30	166 880.0	76.2
	27	4	7	829.28	.82	7	49 756.0	35	176 151.1	84.9
	28	4	8	859.99	.82	8	51 598.9	40	185 422.2	94.1
	29	4	9	890.71	.82	9	53 441.7	45	194 693.3	103.8
2	30	30.714	30	921.41	1842.82	30	55 284.5	1 50	203 964.5	113.9
	31	4	1	952.13	.82	1	57 127.3	55	213 235.6	124.5
	32	4	2	982.85	.82	2	58 970.1	2 00	222 506	136
	33	4	3	1 013.56	.82	3	60 813.0	3 00	333 759	305
	34	4	4	1 044.28	.82	4	62 655.8	4 00	445 012	542
2	35	30.714	35	1 074.99	1842.83	35	64 498.6	5 00	556 266	847
	36	4	6	1 105.70	.83	6	66 341.5	6 00	667 517	1 220
	37	4	7	1 136.42	.83	7	68 184.3	7 00	778 770	1 660
	38	4	8	1 167.13	.83	8	70 027.1	8 00	890 023	2 169
	39	4	9	1 197.85	.83	9	71 869.9	9 00	1 001 275	2 745
2	40	30.714	40	1 228.56	1842.83	40	73 712.8	10 00	1 112 527	3 388
	41	4	1	1 259.27	.83	1	75 555.6	11 00	1 223 778	4 100
	42	4	2	1 289.99	.83	2	77 398.4	12 00	1 335 028	4 879
	43	4	3	1 320.70	.83	3	79 241.3	13 00	1 446 278	5 726
	44	4	4	1 351.42	.83	4	81 084.1	14 00	1 557 528	6 641
2	45	30.714	45	1 382.13	1842.83	45	82 926.9	15 00	1 668 778	7 624
	46	4	6	1 412.84	.83	6	84 769.8	16 00	1 780 027	8 674
	47	4	7	1 443.56	.83	7	86 612.6	17 00	1 891 275	9 792
	48	4	8	1 474.27	.83	8	88 455.4	18 00	2 002 522	10 978
	49	4	9	1 504.99	.83	9	90 298.2	19 00	2 113 768	12 232
2	50	30.714	50	1 535.70	1842.83	50	92 141.1	20 00	2 225 012	13 553
	51	4	1	1 566.41	.83	1	93 983.9	21 00	2 336 257	14 942
	52	4	2	1 597.13	.84	2	95 826.7	22 00	2 447 501	16 399
	53	4	3	1 627.84	.84	3	97 669.5	23 00	2 558 744	17 923
	54	4	4	1 658.56	.84	4	99 512.4	24 00	2 669 986	19 515
2	55	30.714	55	1 689.27	1842.84	55	101 355.2	25 00	2 781 227	21 176
	56	4	6	1 719.98	.84	6	103 198.0	26 00	2 892 466	22 904
	57	4	7	1 750.70	.84	7	105 041.9	27 00	3 003 705	24 700
	58	4	8	1 781.41	.84	8	106 883.7	28 00	3 114 943	26 563
	59	4	9	1 812.13	.84	9	108 726.5	29 00	3 226 179	28 494
2	60	30.714	60	1 842.82	1842.84	60	110 569.4	30 00	3 337 415	30 494

Latitude 3° to 4°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
3 00	30.880	61.76	92.64	123.52	154.40	185.28	216.16	247.04	277.92	1852.8	3705.6	5558.5	7411.3	9264.1
1	.880	.76	.64	.52	.40	.28	.16	.04	.92	2.8	5.5	8.4	1.2	4.0
2	.879	.76	.64	.52	.40	.28	.15	.03	.91	2.8	5.5	8.3	1.1	3.8
3	.879	.76	.64	.51	.39	.27	.15	.03	.91	2.7	5.4	8.2	0.9	3.7
4	.878	.76	.64	.51	.39	.27	.15	.02	.90	2.7	5.4	8.1	0.8	3.5
3 05	30.878	61.76	92.63	123.51	154.39	185.27	216.14	247.02	277.90	1852.7	3705.3	5558.0	7410.7	9263.4
6	.878	.75	.63	.51	.39	.27	.14	.02	.90	2.7	5.3	7.9	0.6	3.3
7	.877	.75	.63	.51	.39	.26	.14	.01	.89	2.6	5.2	7.8	0.5	3.1
8	.877	.75	.63	.50	.38	.26	.14	.01	.89	2.6	5.2	7.8	0.3	3.0
9	.876	.75	.63	.50	.38	.25	.13	.00	.88	2.5	5.1	7.7	0.2	2.8
3 10	30.876	61.75	92.63	123.50	154.38	185.25	216.13	247.00	277.88	1852.5	3705.1	5557.6	7410.1	9262.7
11	.875	.75	.63	.50	.38	.25	.13	7.00	.88	2.5	5.0	7.5	10.0	2.5
12	.875	.75	.62	.50	.37	.25	.12	6.99	.87	2.5	5.0	7.4	09.9	2.4
13	.874	.75	.62	.49	.37	.24	.12	.99	.87	2.4	4.9	7.4	9.7	2.2
14	.874	.75	.62	.49	.37	.24	.11	.98	.86	2.4	4.9	7.3	9.6	2.1
3 15	30.873	61.75	92.62	123.49	154.36	185.24	216.11	246.98	277.86	1852.4	3704.8	5557.2	7409.5	9261.9
16	.872	.74	.62	.49	.36	.23	.11	.98	.85	2.3	4.7	7.1	9.4	1.7
17	.872	.74	.62	.49	.36	.23	.10	.97	.85	2.3	4.7	7.0	9.3	1.6
18	.871	.74	.61	.48	.36	.23	.10	.97	.84	2.3	4.6	6.9	9.1	1.4
19	.871	.74	.61	.48	.35	.22	.09	.96	.84	2.2	4.6	6.8	9.0	1.3
3 20	30.870	61.74	92.61	123.48	154.35	185.22	216.09	246.96	277.83	1852.2	3704.5	5556.7	7408.9	9261.1
21	.870	.74	.61	.48	.35	.22	.09	.96	.83	2.2	4.4	6.6	8.8	1.0
22	.869	.74	.61	.48	.35	.22	.08	.95	.82	2.2	4.3	6.5	8.7	0.8
23	.869	.74	.61	.47	.34	.21	.08	.95	.82	2.1	4.3	6.4	8.5	0.7
24	.868	.74	.61	.47	.34	.21	.08	.94	.81	2.1	4.2	6.3	8.4	0.5
3 25	30.868	61.74	92.60	123.47	154.34	185.21	216.07	246.94	277.81	1852.1	3704.1	5556.2	7408.3	9260.4
26	.867	.73	.60	.47	.34	.20	.07	.94	.81	2.1	4.0	6.1	8.2	0.2
27	.867	.73	.60	.47	.34	.20	.07	.93	.80	2.0	4.0	6.0	8.0	60.0
28	.866	.73	.60	.46	.33	.20	.07	.93	.80	2.0	3.9	5.9	7.9	59.9
29	.866	.73	.60	.46	.33	.19	.06	.92	.79	1.9	3.9	5.8	7.7	9.7
3 30	30.865	61.73	92.60	123.46	154.33	185.19	216.06	246.92	277.79	1851.9	3703.8	5555.7	7407.6	9259.5
31	.864	.73	.59	.46	.33	.19	.06	.92	.79	1.9	3.7	5.6	7.5	9.3
32	.864	.73	.59	.46	.32	.18	.05	.91	.78	1.8	3.7	5.5	7.4	9.2
33	.863	.73	.59	.45	.32	.18	.05	.91	.78	1.8	3.6	5.4	7.2	9.0
34	.863	.73	.59	.45	.32	.18	.04	.90	.77	1.7	3.6	5.3	7.1	8.9
3 35	30.862	61.73	92.59	123.45	154.31	185.17	216.04	246.90	277.77	1851.7	3703.5	5555.2	7407.0	9258.7
36	.862	.72	.59	.45	.31	.17	.04	.90	.76	1.7	3.4	5.1	6.9	8.5
37	.861	.72	.58	.45	.31	.17	.03	.89	.76	1.7	3.3	5.0	6.7	8.4
38	.861	.72	.58	.44	.31	.17	.03	.89	.75	1.6	3.3	4.9	6.6	8.2
39	.860	.72	.58	.44	.30	.16	.02	.88	.75	1.6	3.2	4.8	6.4	8.1
3 40	30.860	61.72	92.58	123.44	154.30	185.16	216.02	246.88	277.74	1851.6	3703.1	5554.7	7406.3	9257.9
41	.859	.72	.58	.44	.30	.16	.02	.88	.73	1.6	3.0	4.6	6.2	7.7
42	.858	.72	.58	.43	.29	.15	.01	.87	.73	1.5	3.0	4.5	6.0	7.5
43	.858	.71	.57	.43	.29	.15	.01	.87	.72	1.5	2.9	4.4	5.9	7.4
44	.857	.71	.57	.43	.29	.14	.00	.86	.72	1.4	2.9	4.3	5.7	7.2
3 45	30.857	61.71	92.57	123.42	154.28	185.14	216.00	246.86	277.71	1851.4	3702.8	5554.2	7405.6	9257.0
46	.856	.71	.57	.42	.28	.14	6.00	.85	.70	1.4	2.7	4.1	5.5	6.8
47	.855	.71	.57	.42	.28	.13	5.99	.85	.70	1.3	2.6	4.0	5.3	6.6
48	.855	.70	.57	.42	.28	.13	.99	.84	.69	1.3	2.6	3.9	5.1	6.5
49	.854	.70	.56	.41	.27	.12	.98	.84	.69	1.2	2.5	3.8	5.0	6.3
3 50	30.854	61.70	92.56	123.41	154.27	185.12	215.98	246.83	277.68	1851.2	3702.4	5553.7	7404.9	9256.1
51	.853	.70	.56	.41	.27	.12	.98	.83	.68	1.2	2.3	3.6	4.8	5.9
52	.852	.70	.56	.41	.26	.11	.97	.82	.67	1.1	2.3	3.5	4.6	5.7
53	.852	.70	.56	.40	.26	.11	.97	.82	.67	1.1	2.2	3.3	4.5	5.6
54	.851	.70	.55	.40	.26	.11	.96	.81	.66	1.0	2.2	3.2	4.3	5.4
3 55	30.851	61.70	92.55	123.40	154.25	185.10	215.96	246.81	277.66	1851.0	3702.1	5553.1	7404.2	9255.2
56	.850	.70	.55	.40	.25	.10	.95	.80	.65	1.0	2.0	3.0	4.0	5.0
57	.849	.70	.55	.40	.25	.10	.95	.80	.65	1.0	1.9	2.9	3.9	4.8
58	.849	.70	.55	.39	.25	.10	.94	.79	.64	0.9	1.9	2.8	3.7	4.7
59	.848	.70	.54	.39	.24	.09	.94	.79	.64	0.9	1.8	2.7	3.6	4.5
3 60	30.848	61.70	92.54	123.39	154.24	185.09	215.93	246.78	277.63	1850.9	3701.7	5552.6	7403.4	9254.3

Lat.	Latitude 3° to 4°—Meridional arcs.						Latitude 3°—Co-ordinates of curvature.		
	Value of 1″	Sums of seconds for middle latitude 3° 30′		Value of 1′	Continuous sums of minutes from latitude 3° 00′		Longitude.	X	Y
° ′	*Meters.*	″	*Meters.*	*Meters.*	′	*Meters.*	° ′	*Meters.*	*Meters.*
3 00	30.714			1842.84					
1	4	1	30.71	.84	1	1 842.8	0 1	1 852.8	
2	4	2	61.43	.84	2	3 685.7	2	3 705.6	0.1
3	4	3	92.14	.84	3	5 528.5	3	5 558.4	0.1
4	4	4	122.86	.84	4	7 371.4	4	7 411.3	0.2
3 05	30.714	5	153.57	1842.84	5	9 214.2	0 5	9 264.1	0.4
6	4	6	184.29	.84	6	11 057.0	6	11 116.9	0.5
7	4	7	215.00	.84	7	12 899.9	7	12 969.7	0.7
8	4	8	245.71	.84	8	14 742.7	8	14 822.5	0.9
9	4	9	276.43	.84	9	16 585.6	9	16 675.3	1.1
3 10	30.714	10	307.14	1842.84	10	18 428.4	0 10	18 528.1	1.4
11	4	1	337.86	.85	1	20 271.3	15	27 792.3	3.2
12	4	2	368.57	.85	2	22 114.1	20	37 056.4	5.6
13	4	3	399.29	.85	3	23 957.0	25	46 320.5	8.8
14	4	4	430.00	.85	4	25 799.8	30	55 584.6	12.7
3 15	30.714	15	460.71	1842.85	15	27 642.7	0 35	64 848.7	17.3
16	4	6	491.43	.85	6	29 485.5	40	74 112.8	22.6
17	4	7	522.14	.85	7	31 328.4	45	83 376.9	28.6
18	4	8	552.86	.85	8	33 171.2	50	92 641.1	35.3
19	4	9	583.57	.85	9	35 014.1	55	101 905.2	42.7
3 20	30.714	20	614.29	1842.85	20	36 856.9	1 00	111 169.3	50.8
21	4	1	645.00	.85	1	38 699.8	05	120 433.3	59.6
22	4	2	675.71	.85	2	40 542.6	10	129 697.4	69.1
23	4	3	706.43	.85	3	42 385.5	15	138 961.5	79.3
24	4	4	737.14	.85	4	44 228.3	20	148 225.7	90.3
3 25	30.714	25	767.86	1842.85	25	46 071.2	1 25	157 489.8	101.9
26	4	6	798.57	.85	6	47 914.0	30	166 753.9	114.2
27	4	7	829.29	.85	7	49 756.9	35	176 018.0	127.3
28	4	8	860.00	.86	8	51 599.7	40	185 282.0	141.0
29	4	9	890.71	.86	9	53 442.6	45	194 546.1	155.5
3 30	30.714	30	921.43	1842.86	30	55 285.5	1 50	203 810.1	170.7
31	4	1	952.14	.86	1	57 128.3	55	213 074.1	186.5
32	4	2	982.86	.86	2	58 971.2	2 00	222 338	203
33	4	3	1 013.57	.86	3	60 814.0	3 00	333 507	457
34	4	4	1 044.29	.86	4	62 656.9	4 00	444 676	812
3 35	30.714	35	1 075.00	1842.86	35	64 499.8	5 00	555 844	1 269
36	4	6	1 105.71	.86	6	66 342.6	6 00	667 012	1 828
37	4	7	1 136.43	.86	7	68 185.5	7 00	778 179	2 488
38	4	8	1 167.14	.86	8	70 028.3	8 00	889 346	3 249
39	4	9	1 197.86	.86	9	71 871.2	9 00	1 000 512	4 112
3 40	30.714	40	1 228.57	1842.86	40	73 714.1	10 00	1 111 677	5 077
41	4	1	1 259.29	.86	1	75 556.9	11 00	1 222 841	6 144
42	4	2	1 290.00	.86	2	77 399.8	12 00	1 334 005	7 312
43	4	3	1 320.71	.87	3	79 242.7	13 00	1 445 166	8 581
44	4	4	1 351.43	.87	4	81 085.5	14 00	1 556 327	9 952
3 45	30.714	45	1 382.14	1842.87	45	82 928.4	15 00	1 667 487	11 424
46	4	6	1 412.86	.87	6	84 771.3	16 00	1 778 645	12 998
47	4	7	1 443.57	.87	7	86 614.1	17 00	1 889 802	14 673
48	4	8	1 474.29	.87	8	88 457.0	18 00	2 000 957	16 450
49	4	9	1 505.00	.87	9	90 299.9	19 00	2 112 110	18 329
3 50	30.715	50	1 535.71	1842.87	50	92 142.7	20 00	2 223 260	20 309
51	5	1	1 566.43	.87	1	93 985.6	21 00	2 334 410	22 391
52	5	2	1 597.14	.87	2	95 828.4	22 00	2 445 557	24 574
53	5	3	1 627.86	.87	3	97 671.3	23 00	2 556 703	26 859
54	5	4	1 658.57	.87	4	99 514.2	24 00	2 667 846	29 245
3 55	30.715	55	1 689.29	1842.87	55	101 357.0	25 00	2 778 988	31 732
56	5	6	1 720.00	.87	6	103 199.9	26 00	2 890 127	34 321
57	5	7	1 750.71	.88	7	105 042.8	27 00	3 001 265	37 012
58	5	8	1 781.43	.88	8	106 885.7	28 00	3 112 399	39 804
59	5	9	1 812.14	.88	9	108 728.5	29 00	3 223 530	42 697
3 60	30.715	60	1 842.86	1842.88	60	110 571.4	30 00	3 334 659	45 693

Latitude 4° to 5°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
4 00	30.848	61.70	92.54	123.39	154.24	185.09	215.93	246.78	277.63	1850.9	3701.7	5552.6	7403.4	9254.3
1	.847	.70	.54	.39	.24	.09	.93	.78	.62	0.9	1.6	2.5	3.3	4.1
2	.846	.70	.54	.39	.23	.08	.92	.77	.62	0.8	1.6	2.4	3.1	3.9
3	.846	.69	.54	.38	.23	.08	.92	.77	.61	0.8	1.5	2.2	3.0	3.8
4	.845	.69	.54	.38	.23	.07	.91	.76	.61	0.7	1.4	2.1	2.8	3.6
4 05	30.845	61.69	92.53	123.38	154.22	185.07	215.91	246.76	277.60	1850.7	3701.4	5552.0	7402.7	9253.4
6	.844	.69	.53	.38	.22	.07	.91	.75	.59	0.7	1.3	1.9	2.5	3.2
7	.843	.69	.53	.38	.22	.06	.90	.75	.59	0.6	1.2	1.8	2.4	3.0
8	.843	.68	.53	.37	.22	.06	.90	.74	.58	0.6	1.1	1.6	2.2	2.8
9	.842	.68	.53	.37	.21	.05	.89	.74	.58	0.5	1.1	1.5	2.1	2.6
4 10	30.841	61.68	92.52	123.37	154.21	185.05	215.89	246.73	277.57	1850.5	3701.0	5551.4	7401.9	9252.4
11	.841	.68	.52	.37	.21	.05	.89	.73	.56	0.5	0.9	1.3	1.8	2.2
12	.840	.68	.52	.36	.20	.04	.88	.72	.56	0.4	0.8	1.2	1.6	2.0
13	.839	.68	.52	.36	.20	.04	.88	.72	.55	0.4	0.8	1.0	1.5	1.8
14	.839	.68	.52	.36	.19	.03	.87	.71	.55	0.3	0.7	0.9	1.3	1.6
4 15	30.838	61.68	92.51	123.35	154.19	185.03	215.87	246.71	277.54	1850.3	3700.6	5550.9	7401.2	9251.4
16	.837	.67	.61	.35	.19	.03	.86	.70	.53	0.3	0.5	0.7	1.0	1.2
17	.837	.67	.51	.35	.18	.02	.86	.70	.53	0.2	0.4	0.6	0.8	1.0
18	.836	.67	.51	.35	.18	.02	.85	.69	.52	0.2	0.4	0.4	0.7	0.8
19	.835	.67	.51	.34	.17	.01	.85	.69	.52	0.1	0.3	0.3	0.5	0.6
4 20	30.835	61.67	92.50	123.34	154.17	185.01	215.84	246.68	277.51	1850.1	3700.2	5550.2	7400.3	9250.4
21	.834	.67	.50	.34	.17	.01	.84	.67	.50	0.1	0.1	0.1	0.1	0.2
22	.833	.67	.50	.33	.16	.00	.83	.67	.50	0.0	700.0	50.0	400.0	50.0
23	.833	.67	.50	.33	.16	5.00	.83	.66	.49	50.0	699.9	49.8	399.8	49.8
24	.832	.67	.50	.33	.16	4.99	.82	.66	.49	49.9	9.8	9.7	9.7	9.6
4 25	30.831	61.67	92.49	123.32	154.15	184.99	215.82	246.65	277.48	1849.9	3699.8	5549.6	7399.5	9249.4
26	.831	.66	.49	.32	.15	.99	.81	.64	.47	9.9	9.7	9.5	9.3	9.2
27	.830	.66	.49	.32	.15	.98	.81	.64	.47	9.8	9.6	9.4	9.2	9.0
28	.829	.66	.49	.32	.15	.98	.80	.63	.46	9.8	9.5	9.2	9.0	8.7
29	.828	.66	.49	.31	.14	.97	.80	.63	.46	9.7	9.4	9.1	8.9	8.5
4 30	30.828	61.66	92.48	123.31	154.14	184.97	215.79	246.62	277.45	1849.7	3699.3	5549.0	7398.7	9248.3
31	.827	.66	.48	.31	.14	.97	.79	.61	.44	9.7	9.2	8.9	8.5	8.1
32	.826	.66	.48	.30	.13	.96	.78	.61	.44	9.6	9.1	8.8	8.3	7.9
33	.826	.65	.48	.30	.13	.96	.78	.60	.43	9.6	9.1	8.6	8.2	7.7
34	.825	.65	.48	.30	.12	.95	.77	.60	.42	9.5	9.0	8.5	8.0	7.5
4 35	30.824	61.65	92.47	123.29	154.12	184.95	215.77	246.59	277.41	1849.5	3698.9	5548.4	7397.8	9247.3
36	.824	.65	.47	.29	.12	.94	.76	.58	.41	9.4	8.8	8.3	7.6	7.1
37	.823	.65	.47	.29	.11	.94	.76	.58	.40	9.4	8.7	8.1	7.4	6.9
38	.822	.64	.47	.29	.11	.93	.75	.57	.39	9.3	8.7	8.0	7.3	6.6
39	.821	.64	.46	.28	.10	.93	.75	.57	.38	9.3	8.6	7.8	7.1	6.4
4 40	30.821	61.64	92.46	123.28	154.10	184.92	215.74	246.56	277.38	1849.2	3698.5	5547.7	7396.9	9246.2
41	.820	.64	.46	.28	.10	.92	.74	.56	.37	9.2	8.4	7.6	6.7	6.0
42	.819	.64	.46	.27	.09	.91	.73	.55	.37	9.1	8.3	7.5	6.6	5.8
43	.818	.64	.46	.27	.09	.91	.73	.55	.36	9.1	8.2	7.3	6.4	5.5
44	.818	.64	.45	.27	.09	.90	.72	.54	.36	9.0	8.1	7.2	6.3	5.3
4 45	30.817	61.64	92.45	123.26	154.08	184.90	215.72	246.54	277.35	1849.0	3698.0	5547.1	7396.1	9245.1
46	.816	.63	.45	.26	.08	.90	.71	.53	.34	9.0	8.0	7.0	5.9	4.9
47	.816	.63	.45	.26	.08	.89	.71	.53	.34	8.9	7.9	6.8	5.7	4.7
48	.815	.63	.44	.26	.08	.89	.70	.52	.33	8.9	7.8	6.7	5.6	4.4
49	.814	.63	.44	.25	.07	.88	.70	.52	.33	8.8	7.7	6.5	5.4	4.2
4 50	30.813	61.63	92.44	123.25	154.07	184.88	215.69	246.51	277.32	1848.8	3697.6	5546.4	7395.2	9244.0
51	.813	.63	.44	.25	.07	.88	.69	.50	.31	8.8	7.5	6.3	5.0	3.8
52	.812	.63	.44	.24	.06	.87	.68	.50	.31	8.7	7.4	6.1	4.8	3.5
53	.811	.62	.43	.24	.06	.87	.68	.49	.30	8.7	7.3	6.0	4.7	3.3
54	.810	.62	.43	.24	.05	.86	.67	.48	.29	8.6	7.2	5.8	4.5	3.0
4 55	30.809	61.62	92.43	123.23	154.05	184.86	215.67	246.47	277.28	1848.6	3697.1	5545.7	7394.3	9242.8
56	.809	.62	.43	.23	.05	.85	.66	.47	.28	8.5	7.1	5.6	4.1	2.6
57	.808	.62	.42	.23	.04	.85	.66	.46	.27	8.5	7.0	5.4	3.9	2.4
58	.807	.61	.42	.23	.04	.84	.65	.45	.26	8.4	6.9	5.3	3.7	2.1
59	.806	.61	.42	.22	.03	.84	.65	.45	.26	8.4	6.8	5.1	3.5	1.9
4 60	30.806	61.61	92.42	123.22	154.03	184.83	215.64	246.44	277.25	1848.3	3696.7	5545.0	7393.3	9241.7

Lat.	Latitude 4° to 5°—Meridional arcs.						Latitude 4°—Co-ordinates of curvature.		
	Value of 1″	Sums of seconds for middle latitude 4° 30′		Value of 1′	Continuous sums of minutes from latitude 4° 00′		Longitude.	X	Y
° ′	*Meters.*	″	*Meters.*	*Meters.*	′	*Meters.*	° ′	*Meters.*	*Meters.*
4 00	30.715			1842.88					
1	5	1	30.72	.88	1	1 842.9	0 1	1 850.9	
2	5	2	61.43	.88	2	3 685.8	2	3 701.7	0.1
3	5	3	92.15	.88	3	5 528.6	3	5 552.6	0.2
4	5	4	122.86	.88	4	7 371.5	4	7 403.4	0.3
4 05	30.715	5	153.58	1842.88	5	9 214.4	0 5	9 254.3	0.5
6	5	6	184.29	.88	6	11 057.3	6	11 105.1	0.7
7	5	7	215.01	.88	7	12 900.2	7	12 956.0	0.9
8	5	8	245.72	.89	8	14 743.1	8	14 806.9	1.2
9	5	9	276.44	.89	9	16 585.9	9	16 657.7	1.5
4 10	30.715	10	307.15	1842.89	10	18 428.8	0 10	18 508.6	1.9
11	5	1	337.87	.89	1	20 271.7	15	27 762.8	4.2
12	5	2	368.58	.89	2	22 114.6	20	37 017.1	7.5
13	5	3	399.30	.89	3	23 957.5	25	46 271.4	11.7
14	5	4	430.01	.89	4	25 800.4	30	55 525.7	16.9
4 15	30.715	15	460.73	1842.89	15	27 643.3	0 35	64 780.0	23.0
16	5	6	491.44	.89	6	29 486.2	40	74 034.3	30.0
17	5	7	522.16	.89	7	31 329.0	45	83 288.5	38.0
18	5	8	552.87	.89	8	33 171.9	50	92 542.8	46.9
19	5	9	583.59	.89	9	35 014.8	55	101 797.1	56.8
4 20	30.715	20	614.30	1842.89	20	36 857.7	1 00	111 051.4	67.6
21	5	1	645.02	.90	1	38 700.6	05	120 305.7	79.3
22	5	2	675.73	.90	2	40 543.5	10	129 559.9	92.0
23	5	3	706.45	.90	3	42 386.4	15	138 814.2	105.6
24	5	4	737.16	.90	4	44 229.3	20	148 068.5	120.2
4 25	30.715	25	767.88	1842.90	25	46 072.2	1 25	157 322.7	135.7
26	5	6	798.59	.90	6	47 915.1	30	166 577.0	152.1
27	5	7	829.31	.90	7	49 758.0	35	175 831.3	169.5
28	5	8	860.02	.90	8	51 600.9	40	185 085.5	187.8
29	5	9	890.74	.90	9	53 443.8	45	194 339.8	207.0
4 30	30.715	30	921.45	1842.90	30	55 286.7	1 50	203 594.0	227.2
31	5	1	952.17	.90	1	57 129.6	55	212 848.3	248.3
32	5	2	982.88	.90	2	58 972.5	2 00	222 102	270
33	5	3	1 013.60	.90	3	60 815.4	3 00	333 153	608
34	5	4	1 044.31	.90	4	62 658.3	4 00	444 203	1 082
4 35	30.715	35	1 075.03	1842.91	35	64 501.2	5 00	555 253	1 691
36	5	6	1 105.74	.91	6	66 344.1	6 00	666 302	2 434
37	5	7	1 136.46	.91	7	68 187.0	7 00	777 350	3 312
38	5	8	1 167.17	.91	8	70 029.9	8 00	888 397	4 326
39	5	9	1 197.89	.91	9	71 872.9	9 00	999 442	5 476
4 40	30.715	40	1 228.60	1842.91	40	73 715.8	10 00	1 110 487	6 760
41	5	1	1 259.32	.91	1	75 558.7	11 00	1 221 529	8 180
42	5	2	1 290.03	.91	2	77 401.6	12 00	1 332 570	9 735
43	5	3	1 320.75	.91	3	79 244.5	13 00	1 443 608	11 425
44	5	4	1 351.46	.91	4	81 087.4	14 00	1 554 644	13 250
4 45	30.715	45	1 382.18	1842.91	45	82 930.3	15 00	1 665 678	15 210
46	5	6	1 412.89	.92	6	84 773.2	16 00	1 776 710	17 305
47	5	7	1 443.61	.92	7	86 616.2	17 00	1 887 739	19 536
48	5	8	1 474.32	.92	8	88 459.1	18 00	1 998 765	21 902
49	5	9	1 505.04	.92	9	90 302.0	19 00	2 109 789	24 403
4 50	30.715	50	1 535.75	1842.92	50	92 144.9	20 00	2 220 809	27 039
51	5	1	1 566.47	.92	1	93 987.8	21 00	2 331 825	29 810
52	5	2	1 597.18	.92	2	95 830.8	22 00	2 442 839	32 717
53	5	3	1 627.90	.92	3	97 673.7	23 00	2 553 848	35 758
54	5	4	1 658.61	.92	4	99 516.6	24 00	2 664 854	38 935
4 55	30.715	55	1 689.33	1842.92	55	101 359.5	25 00	2 775 856	42 248
56	5	6	1 720.04	.93	6	103 202.4	26 00	2 886 854	45 696
57	5	7	1 750.76	.93	7	105 045.4	27 00	2 997 848	49 278
58	5	8	1 781.47	.93	8	106 888.3	28 00	3 108 837	52 995
59	5	9	1 812.19	.93	9	108 731.2	29 00	3 219 821	56 848
4 60	30.715	60	1 842.90	.93	60	110 574.1	30 00	3 330 801	60 835

Latitude 5° to 6°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
5 00	30.806	61.61	92.42	123.22	154.03	184.83	215.64	246.44	277.25	1848.3	3696.7	5545.0	7393.3	9241.7
1	.805	.61	.42	.22	.03	.83	.63	.43	.24	8.3	6.6	4.9	3.1	1.5
2	.804	.61	.41	.21	.02	.82	.63	.43	.24	8.2	6.5	4.7	2.9	1.2
3	.803	.61	.41	.21	.02	.82	.62	.42	.23	8.2	6.4	4.6	2.8	1.0
4	.802	.61	.41	.21	.01	.81	.62	.42	.22	8.1	6.3	4.4	2.6	0.7
5 05	30.802	61.61	92.40	123.20	154.01	184.81	215.61	246.41	277.21	1848.1	3696.2	5544.3	7392.4	9240.5
6	.801	.60	.40	.20	.01	.81	.60	.40	.21	8.1	6.1	4.2	2.2	0.3
7	.800	.60	.40	.20	.00	.80	.60	.40	.20	8.0	6.0	4.0	2.0	40.0
8	.799	.60	.40	.20	4.00	.80	.59	.39	.19	8.0	5.9	3.9	1.8	39.8
9	.798	.60	.39	.19	3.99	.79	.59	.39	.19	7.9	5.8	3.7	1.6	9.5
5 10	30.798	61.60	92.39	123.19	153.99	184.79	215.58	246.38	277.18	1847.9	3695.7	5543.6	7391.4	9239.3
11	.797	.60	.39	.19	.99	.78	.58	.37	.17	7.8	5.6	3.4	1.2	9.0
12	.796	.60	.39	.18	.98	.78	.57	.37	.16	7.8	5.5	3.3	1.0	8.8
13	.795	.59	.38	.18	.98	.77	.57	.36	.16	7.7	5.4	3.1	0.9	8.5
14	.794	.59	.38	.18	.97	.77	.56	.36	.15	7.7	5.3	3.0	0.7	8.3
5 15	30.793	61.59	92.38	123.17	153.97	184.76	215.56	246.35	277.14	1847.6	3695.2	5542.8	7390.5	9238.0
16	.793	.59	.38	.17	.97	.76	.55	.34	.13	7.6	5.1	2.7	0.3	7.8
17	.792	.59	.38	.17	.96	.75	.55	.34	.12	7.5	5.0	2.5	90.1	7.5
18	.791	.58	.37	.17	.96	.75	.54	.33	.12	7.5	4.9	2.4	89.9	7.3
19	.790	.58	.37	.16	.95	.74	.54	.33	.11	7.4	4.8	2.2	9.7	7.0
5 20	30.789	61.58	92.37	123.16	153.95	184.74	215.53	246.32	277.10	1847.4	3694.7	5542.1	7389.5	9236.8
21	.788	.58	.37	.16	.95	.73	.52	.31	.09	7.3	4.6	1.9	9.3	6.5
22	.788	.58	.36	.15	.94	.73	.52	.31	.09	7.3	4.5	1.8	9.1	6.3
23	.787	.57	.36	.15	.94	.72	.51	.30	.08	7.2	4.4	1.6	8.8	6.0
24	.786	.57	.36	.14	.93	.72	.51	.29	.07	7.2	4.3	1.5	8.6	5.8
5 25	30.785	61.57	92.35	123.14	153.93	184.71	215.50	246.28	277.06	1847.1	3694.2	5541.3	7388.4	9235.5
26	.784	.57	.35	.14	.92	.71	.49	.28	.06	7.1	4.1	1.2	8.2	5.3
27	.783	.57	.35	.13	.92	.70	.49	.27	.05	7.0	4.0	1.0	8.0	5.0
28	.783	.56	.35	.13	.91	.70	.48	.26	.04	7.0	3.9	0.9	7.8	4.8
29	.782	.56	.34	.12	.91	.69	.48	.26	.04	6.9	3.8	0.7	7.6	4.5
5 30	30.781	61.56	92.34	123.12	153.90	184.69	215.47	246.25	277.03	1846.9	3693.7	5540.6	7387.4	9234.3
31	.780	.56	.34	.12	.90	.68	.46	.24	.02	6.8	3.6	0.4	7.2	4.0
32	.779	.56	.34	.11	.89	.67	.46	.24	.01	6.7	3.5	0.3	7.0	3.8
33	.778	.55	.33	.11	.89	.67	.45	.23	.01	6.7	3.4	0.1	6.8	3.5
34	.778	.55	.33	.11	.88	.67	.45	.22	7.00	6.7	3.3	40.0	6.6	3.3
5 35	30.777	61.55	92.33	123.10	153.88	184.66	215.44	246.21	276.99	1846.6	3693.2	5539.8	7386.4	9233.0
36	.776	.55	.33	.10	.88	.65	.43	.21	.98	6.5	3.1	9.6	6.2	2.7
37	.775	.55	.33	.10	.87	.65	.43	.20	.97	6.5	3.0	9.5	6.0	2.5
38	.774	.54	.32	.10	.87	.64	.42	.19	.97	6.4	2.9	9.3	5.8	2.2
39	.773	.54	.32	.09	.86	.64	.42	.19	.96	6.4	2.8	9.2	5.6	2.0
5 40	30.772	61.54	92.32	123.09	153.86	184.63	215.41	246.18	276.95	1846.3	3692.7	5539.0	7385.4	9231.7
41	.771	.54	.31	.09	.86	.63	.40	.17	.94	6.3	2.6	8.8	5.2	1.4
42	.770	.54	.31	.08	.85	.62	.40	.17	.93	6.2	2.5	8.7	5.0	1.1
43	.770	.54	.31	.08	.85	.62	.39	.16	.93	6.2	2.3	8.5	4.7	0.9
44	.769	.54	.31	.07	.84	.61	.38	.15	.92	6.1	2.2	8.4	4.5	0.6
5 45	30.768	61.54	92.30	123.07	153.84	184.61	215.37	246.14	276.91	1846.1	3692.1	5538.2	7384.3	9230.3
46	.767	.53	.30	.07	.84	.60	.37	.14	.90	6.0	2.0	8.0	4.1	30.0
47	.766	.53	.30	.06	.83	.60	.36	.13	.89	6.0	1.9	7.9	3.9	29.8
48	.765	.53	.30	.06	.83	.59	.35	.12	.89	5.9	1.8	7.7	3.7	9.5
49	.764	.53	.29	.05	.82	.59	.35	.12	.88	5.9	1.7	7.6	3.5	9.3
5 50	30.763	61.53	92.29	123.05	153.82	184.58	215.34	246.11	276.87	1845.8	3691.6	5537.4	7383.2	9229.0
51	.762	.53	.29	.05	.82	.57	.33	.10	.86	5.7	1.5	7.2	3.0	8.7
52	.761	.53	.28	.04	.81	.57	.33	.09	.85	5.7	1.4	7.0	2.8	8.4
53	.761	.52	.28	.04	.81	.56	.32	.09	.85	5.6	1.2	6.9	2.5	8.2
54	.760	.52	.28	.04	.80	.56	.32	.08	.84	5.6	1.1	6.7	2.3	7.9
5 55	30.759	61.52	92.27	123.03	153.80	184.55	215.31	246.07	276.83	1845.5	3691.0	5536.5	7382.1	9227.6
56	.758	.52	.27	.03	.79	.54	.30	.06	.82	5.4	0.9	6.3	1.9	7.3
57	.757	.52	.27	.03	.79	.54	.30	.05	.81	5.4	0.8	6.2	1.7	7.0
58	.756	.51	.27	.03	.78	.53	.29	.05	.81	5.3	0.7	6.0	1.4	6.8
59	.755	.51	.26	.02	.78	.53	.29	.04	.80	5.3	0.6	5.9	1.2	6.5
5 60	30.754	61.51	92.26	123.02	153.77	184.52	215.28	246.03	276.79	1845.2	3690.5	5535.7	7381.0	9226.2

Lat.	Latitude 5° to 6°—Meridional arcs.						Latitude 5°—Co-ordinates of curvature.		
	Value of 1″	Sums of seconds for middle latitude 5° 30′		Value of 1′	Continuous sums of minutes from latitude 5° 00′		Longitude.	X	Y
° ′	*Meters.*	″	*Meters.*	*Meters.*	′	*Meters.*	° ′	*Meters.*	*Meters.*
5 00	30.715			1842.93					
1	5	1	30.72	.93	1	1 842.9	0 1	1 848.3	
2	6	2	61.43	.93	2	3 685.9	2	3 696.7	0.1
3	6	3	92.15	.93	3	5 528.8	3	5 545.0	0.2
4	6	4	122.86	.93	4	7 371.7	4	7 393.3	0.4
5 05	30.716	5	153.58	1842.93	5	9 214.7	0 5	9 241.7	0.6
6	6	6	184.30	.93	6	11 057.6	6	11 090.0	0.8
7	6	7	215.01	.94	7	12 900.5	7	12 938.3	1.1
8	6	8	245.73	.94	8	14 743.5	8	14 786.7	1.5
9	6	9	276.44	.94	9	16 586.4	9	16 635.0	1.9
5 10	30.716	10	307.16	1842.94	10	18 429.3	0 10	18 483.3	2.3
11	6	1	337.88	.94	1	20 272.3	15	27 725.0	5.3
12	6	2	368.59	.94	2	22 115.2	20	36 966.6	9.4
13	6	3	399.31	.94	3	23 958.2	25	46 208.3	14.6
14	6	4	430.02	.94	4	25 801.1	30	55 449.9	21.1
5 15	30.716	15	460.74	1842.94	15	27 644.1	0 35	64 691.6	28.7
16	6	6	491.46	.94	6	29 487.0	40	73 933.3	37.5
17	6	7	522.17	.95	7	31 329.9	45	83 174.9	47.4
18	6	8	552.89	.95	8	33 172.9	50	92 416.6	58.6
19	6	9	583.60	.95	9	35 015.8	55	101 658.2	70.9
5 20	30.716	20	614.32	1842.85	20	36 858.8	1 00	110 899.9	84.4
21	6	1	645.04	.95	1	38 701.7	05	120 141.5	99.0
22	6	2	675.75	.95	2	40 544.7	10	129 383.2	114.8
23	6	3	706.47	.95	3	42 387.6	15	138 624.8	131.8
24	6	4	737.18	.95	4	44 230.6	20	147 866.4	150.0
5 25	30.716	25	767.90	1842.95	25	46 073.5	1 25	157 108.0	169.3
26	6	6	798.62	.95	6	47 916.5	30	166 349.7	189.8
27	6	7	829.33	.96	7	49 759.5	35	175 591.3	211.5
28	6	8	860.05	.96	8	51 602.4	40	184 832.9	234.3
29	6	9	890.76	.96	9	53 445.4	45	194 074.5	258.3
5 30	30.716	30	921.48	1842.96	30	55 288.3	1 50	203 316.2	283.5
31	6	1	952.20	.96	1	57 131.3	55	212 557.8	309.9
32	6	2	982.91	.96	2	58 974.3	2 00	221 799	337
33	6	3	1 013.63	.96	3	60 817.2	3 00	332 699	759
34	6	4	1 044.34	.96	4	62 660.2	4 00	443 597	1 349
5 35	30.716	35	1 075.06	1842.96	35	64 503.1	5 00	554 494	2 108
36	6	6	1 105.78	.97	6	66 346.1	6 00	665 390	3 036
37	6	7	1 136.49	.97	7	68 189.1	7 00	776 284	4 133
38	6	8	1 167.21	.97	8	70 032.0	8 00	887 177	5 398
39	6	9	1 197.92	.97	9	71 875.0	9 00	998 068	6 832
5 40	30.716	40	1 228.64	1842.97	40	73 718.0	10 00	1 108 956	8 435
41	6	1	1 259.36	.97	1	75 560.9	11 00	1 219 842	10 206
42	6	2	1 290.07	.97	2	77 403.9	12 00	1 330 725	12 146
43	6	3	1 320.79	.97	3	79 246.9	13 00	1 441 604	14 255
44	6	4	1 351.50	.97	4	81 089.9	14 00	1 552 481	16 532
5 45	30.716	45	1 382.22	1842.97	45	82 932.9	15 00	1 663 354	18 977
46	6	6	1 412.94	.98	6	84 775.8	16 00	1 774 223	21 592
47	6	7	1 443.65	.98	7	86 618.8	17 00	1 885 088	24 376
48	6	8	1 474.37	.98	8	88 461.8	18 00	1 995 948	27 328
49	6	9	1 505.08	.98	9	90 304.8	19 00	2 106 804	30 448
5 50	30.716	50	1 535.80	1842.98	50	92 147.7	20 00	2 217 655	33 737
51	6	1	1 566.52	.98	1	93 990.7	21 00	2 328 502	37 195
52	6	2	1 597.23	.98	2	95 833.7	22 00	2 439 342	40 821
53	6	3	1 627.95	.98	3	97 676.7	23 00	2 550 177	44 616
54	6	4	1 658.66	.98	4	99 519.7	24 00	2 661 006	48 579
5 55	30.716	55	1 689.38	1842.98	55	101 362.7	25 00	2 771 829	52 711
56	6	6	1 720.10	.99	6	103 205.6	26 00	2 882 645	57 013
57	6	7	1 750.81	.99	7	105 048.6	27 00	2 993 455	61 483
58	6	8	1 781.53	.99	8	106 891.6	28 00	3 104 259	66 120
59	6	9	1 812.24	.99	9	108 734.6	29 00	3 215 055	70 926
5 60	30.716	60	1 842.96	1842.99	60	110 577.6	30 00	3 325 844	75 900

Latitude 6° to 7°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
6 00	30.754	61.51	92.26	123.02	153.77	184.52	215.28	246.03	276.79	1845.2	3690.5	5535.7	7381.0	9226.2
1	.753	.51	.26	.02	.77	.52	.27	.02	.78	5.2	0.4	5.5	0.8	5.9
2	.752	.51	.26	.01	.76	.51	.27	.02	.77	5.1	0.3	5.4	0.6	5.6
3	.751	.50	.25	.01	.76	.51	.26	.01	.76	5.1	0.1	5.2	0.3	5.4
4	.750	.50	.25	.00	.75	.50	.25	6.00	.75	5.0	90.0	5.1	80.1	5.1
6 05	30.749	61.50	92.25	123.00	153.75	184.50	215.24	245.99	276.74	1845.0	3689.9	5534.9	7379.9	9224.8
6	.748	.50	.24	.00	.74	.49	.24	.99	.74	4.9	9.8	4.7	9.7	4.5
7	.747	.50	.24	3.00	.74	.49	.23	.98	.73	4.9	9.7	4.5	9.4	4.2
8	.747	.49	.24	2.99	.73	.48	.22	.97	.72	4.8	9.6	4.4	9.2	4.0
9	.746	.49	.24	.99	.73	.48	.22	.97	.71	4.8	9.5	4.2	8.9	3.7
6 10	30.745	61.49	92.23	122.98	153.72	184.47	215.21	245.96	276.70	1844.7	3689.4	5534.0	7378.7	9223.4
11	.744	.49	.23	.98	.72	.46	.20	.95	.69	4.6	9.3	3.8	8.5	3.1
12	.743	.49	.23	.97	.71	.46	.20	.94	.68	4.6	9.2	3.7	8.3	2.8
13	.742	.48	.22	.97	.71	.45	.19	.94	.67	4.5	9.0	3.5	8.0	2.5
14	.741	.48	.22	.96	.70	.45	.18	.93	.66	4.5	8.9	3.4	7.8	2.2
6 15	30.740	61.48	92.22	122.96	153.70	184.44	215.17	245.92	276.65	1844.4	3688.8	5533.2	7377.6	9221.9
16	.739	.48	.22	.96	.69	.43	.17	.91	.65	4.3	8.7	3.0	7.4	1.6
17	.738	.48	.21	.95	.69	.43	.16	.90	.64	4.3	8.6	2.8	7.1	1.3
18	.737	.47	.21	.95	.68	.42	.15	.90	.63	4.2	8.4	2.7	6.9	1.1
19	.736	.47	.21	.94	.68	.42	.15	.89	.62	4.2	8.3	2.5	6.6	0.8
6 20	30.735	61.47	92.20	122.94	153.67	184.41	215.14	245.88	276.61	1844.1	3688.2	5532.3	7376.4	9220.5
21	.734	.47	.20	.94	.67	.40	.13	.87	.60	4.0	8.1	2.1	6.2	20.2
22	.733	.47	.20	.93	.66	.40	.13	.86	.59	4.0	8.0	1.9	5.9	19.9
23	.732	.46	.20	.93	.66	.39	.12	.86	.58	3.9	7.8	1.8	5.7	9.6
24	.731	.46	.19	.92	.65	.39	.11	.85	.57	3.9	7.7	1.6	5.4	9.3
6 25	30.730	61.46	92.19	122.92	153.65	184.38	215.10	245.84	276.56	1843.8	3687.6	5531.4	7375.2	9219.0
26	.729	.46	.19	.92	.64	.37	.10	.83	.56	3.7	7.5	1.2	5.0	8.7
27	.728	.46	.18	.91	.64	.37	.09	.82	.55	3.7	7.4	1.0	4.7	8.4
28	.727	.45	.18	.91	.63	.36	.08	.82	.54	3.6	7.2	0.9	4.5	8.1
29	.726	.45	.18	.90	.63	.36	.08	.81	.53	3.6	7.1	0.7	4.2	7.8
6 30	30.725	61.45	92.17	122.90	153.62	184.35	215.07	245.80	276.52	1843.5	3687.0	5530.5	7374.0	9217.5
31	.724	.45	.17	.90	.62	.34	.06	.79	.51	3.4	6.9	0.3	3.8	7.2
32	.723	.45	.17	.89	.61	.34	.06	.78	.50	3.4	6.8	0.1	3.5	6.9
33	.722	.44	.16	.89	.61	.33	.05	.78	.49	3.3	6.6	30.0	3.3	6.5
34	.721	.44	.16	.88	.60	.33	.04	.77	.48	3.3	6.5	29.8	3.0	6.2
6 35	30.720	61.44	92.16	122.88	153.60	184.32	215.03	245.76	276.47	1843.2	3686.4	5529.6	7372.8	9215.9
36	.719	.44	.16	.88	.59	.31	.03	.75	.47	3.1	6.3	9.4	2.6	5.6
37	.718	.44	.15	.87	.59	.31	.02	.74	.46	3.1	6.2	9.2	2.3	5.3
38	.717	.43	.15	.87	.58	.30	.01	.74	.45	3.0	6.0	9.1	2.1	5.0
39	.716	.43	.15	.86	.58	.30	.01	.73	.44	3.0	5.9	8.9	1.8	4.7
6 40	30.715	61.43	92.14	122.86	153.57	184.29	215.00	245.72	276.43	1842.9	3685.8	5528.7	7371.6	9214.4
41	.714	.43	.14	.86	.57	.28	4.99	.71	.42	2.8	5.7	8.5	1.3	4.1
42	.713	.43	.14	.85	.56	.28	.99	.70	.41	2.8	5.5	8.3	1.1	3.8
43	.711	.42	.13	.85	.56	.27	.98	.69	.40	2.7	5.4	8.1	0.8	3.4
44	.710	.42	.13	.84	.55	.27	.97	.68	.39	2.7	5.2	7.9	0.6	3.1
6 45	30.709	61.42	92.13	122.84	153.55	184.26	214.96	245.67	276.38	1842.6	3685.1	5527.7	7370.3	9212.8
46	.708	.42	.12	.84	.54	.25	.96	.67	.38	2.5	5.0	7.5	70.0	2.5
47	.707	.42	.12	.83	.54	.25	.95	.66	.37	2.5	4.9	7.3	69.8	2.2
48	.706	.41	.12	.83	.53	.24	.94	.65	.36	2.4	4.7	7.2	9.5	1.9
49	.705	.41	.12	.82	.53	.24	.94	.64	.35	2.4	4.6	7.0	9.3	1.6
6 50	30.704	61.41	92.11	122.82	153.52	184.23	214.93	245.63	276.34	1842.3	3684.5	5526.8	7369.0	9211.3
51	.703	.41	.11	.82	.52	.22	.92	.62	.33	2.2	4.4	6.6	8.7	1.0
52	.702	.41	.11	.81	.51	.21	.91	.61	.32	2.1	4.3	6.4	8.5	0.6
53	.701	.40	.10	.81	.51	.21	.91	.61	.31	2.1	4.1	6.2	8.2	10.3
54	.700	.40	.10	.80	.50	.20	.90	.60	.30	2.0	4.0	6.0	8.0	09.9
6 55	30.699	61.40	92.10	122.80	153.50	184.19	214.89	245.59	276.29	1841.9	3683.9	5525.8	7367.7	9209.6
56	.698	.40	.09	.79	.49	.19	.88	.58	.28	1.9	3.8	5.6	7.4	9.3
57	.697	.40	.09	.79	.49	.18	.87	.57	.27	1.8	3.6	5.4	7.2	9.0
58	.695	.39	.09	.78	.48	.17	.87	.57	.26	1.7	3.5	5.2	6.9	8.6
59	.694	.39	.08	.78	.48	.17	.86	.56	.25	1.7	3.3	5.0	6.7	8.3
6 60	30.693	61.39	92.08	122.77	153.47	184.16	214.85	245.55	276.24	1841.6	3683.2	5524.8	7366.4	9208.0

Lat.	Latitude 6° to 7°—Meridional arcs.						Latitude 6°—Co-ordinates of curvature.		
	Value of 1″	Sums of seconds for middle latitude 6° 30′		Value of 1′	Continuous sums of minutes from latitude 6° 00′		Longitude.	X	Y
° ′	*Meters.*	″	*Meters.*	*Meters.*	′	*Meters.*	° ′	*Meters.*	*Meters.*
6 00	30.716			1842.99					
1	7	1	30.72	.99	1	1 843.0	0 1	1 845.3	
2	7	2	61.43	.99	2	3 686.0	2	3 690.5	0.1
3	7	3	92.15	.99	3	5 529.0	3	5 535.8	0.2
4	7	4	122.87	.99	4	7 372.0	4	7 381.0	0.4
6 05	30.717	5	153.59	1843.00	5	9 215.0	0 5	9 226.3	0.7
6	7	6	184.30	.00	6	11 058.0	6	11 071.5	1.0
7	7	7	215.02	.00	7	12 901.0	7	12 916.7	1.4
8	7	8	245.74	.00	8	14 744.0	8	14 762.0	1.8
9	7	9	276.45	.00	9	16 587.0	9	16 607.2	2.3
6 10	30.717	10	307.17	1843.00	10	18 430.0	0 10	18 452.5	2.8
11	7	1	337.89	.00	1	20 273.0	15	27 678.8	6.3
12	7	2	368.61	.00	2	22 116.0	20	36 905.0	11.2
13	7	3	399.32	.00	3	23 959.0	25	46 131.2	17.5
14	7	4	430.04	.01	4	25 802.0	30	55 357.5	25.3
6 15	30.717	15	460.76	1843.01	15	27 645.0	0 35	64 583.8	34.4
16	7	6	491.47	.01	6	29 488.0	40	73 810.0	44.9
17	7	7	522.19	.01	7	31 331.0	45	83 036.2	56.8
18	7	8	552.91	.01	8	33 174.0	50	92 262.5	70.1
19	7	9	583.63	.01	9	35 017.0	55	101 488.7	84.9
6 20	30.717	20	614.34	1843.01	20	36 860.0	1 00	110 714.9	101.0
21	7	1	645.06	.01	1	38 703.1	05	119 941.2	118.5
22	7	2	675.78	.02	2	40 546.1	10	129 167.4	137.5
23	7	3	706.49	.02	3	42 389.1	15	138 393.6	157.8
24	7	4	737.21	.02	4	44 232.1	20	147 619.9	179.5
6 25	30.717	25	767.93	1843.02	25	46 075.1	1 25	156 846.1	202.7
26	7	6	798.65	.02	6	47 918.2	30	166 072.3	227.2
27	7	7	829.36	.02	7	49 761.2	35	175 298.5	253.2
28	7	8	860.08	.02	8	51 604.2	40	184 524.7	280.5
29	7	9	890.80	.02	9	53 447.2	45	193 750.9	309.3
6 30	30.717	30	921.51	1843.03	30	55 290.3	1 50	202 977.1	339.4
31	7	1	952.23	.03	1	57 133.3	55	212 203.3	371.0
32	7	2	982.95	.03	2	58 976.3	2 00	221 429	404
33	7	3	1 013.67	.03	3	60 819.4	3 00	332 143	909
34	7	4	1 044.38	.03	4	62 662.4	4 00	442 856	1 616
6 35	30.717	35	1 075.10	1843.03	35	64 505.4	5 00	553 567	2 525
36	7	6	1 105.82	.03	6	66 348.4	6 00	664 277	3 636
37	7	7	1 136.54	.03	7	68 191.5	7 00	774 984	4 949
38	7	8	1 167.25	.04	8	70 034.5	8 00	885 689	6 464
39	7	9	1 197.97	.04	9	71 877.6	9 00	996 390	8 180
6 40	30.717	40	1 228.69	1843.04	40	73 720.6	10 00	1 107 088	10 099
41	7	1	1 259.40	.04	1	75 563.6	11 00	1 217 783	12 220
42	7	2	1 290.12	.04	2	77 406.7	12 00	1 328 474	14 543
43	7	3	1 320.84	.04	3	79 249.7	13 00	1 439 160	17 067
44	7	4	1 351.56	.04	4	81 092.8	14 00	1 549 841	19 793
6 45	30.717	45	1 382.27	1843.04	45	82 935.8	15 00	1 660 518	22 721
46	7	6	1 412.97	.05	6	84 778.9	16 00	1 771 189	25 852
47	7	7	1 443.71	.05	7	86 621.9	17 00	1 881 854	29 185
48	7	8	1 474.42	.05	8	88 464.9	18 00	1 992 512	32 719
49	7	9	1 505.14	.05	9	90 308.0	19 00	2 103 164	36 454
6 50	30.718	50	1 535.86	1843.05	50	92 151.1	20 00	2 213 809	40 392
51	8	1	1 566.57	.05	1	93 994.1	21 00	2 324 446	44 532
52	8	2	1 597.29	.05	2	95 837.2	22 00	2 435 076	48 874
53	8	3	1 628.01	.05	3	97 680.2	23 00	2 545 698	53 418
54	8	4	1 658.72	.06	4	99 523.3	24 00	2 656 311	58 163
6 55	30.718	55	1 689.44	1843.06	55	101 366.3	25 00	2 766 915	63 109
56	8	6	1 720.16	.06	6	103 209.4	26 00	2 877 511	68 257
57	8	7	1 750.88	.06	7	105 052.4	27 00	2 988 097	73 607
58	8	8	1 781.59	.06	8	106 895.5	28 00	3 098 672	79 160
59	8	9	1 812.31	.06	9	108 738.6	29 00	3 209 237	84 915
6 60	30.718	60	1 843.03	1843.06	60	110 581.6	30 00	3 319 792	90 871

Latitude 7° to 8°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
7 00	30.693	61.39	92.08	122.77	153.47	184.16	214.85	245.55	276.24	1841.6	3683.2	5524.8	7366.4	9208.0
1	.692	.39	.08	.77	.46	.15	.84	.54	.23	1.5	3.1	4.6	6.1	7.7
2	.691	.39	.07	.76	.46	.15	.84	.53	.22	1.5	3.0	4.4	5.9	7.4
3	.690	.38	.07	.76	.45	.14	.83	.52	.21	1.4	2.8	4.2	5.6	7.0
4	.689	.38	.07	.75	.45	.13	.82	.51	.20	1.3	2.7	4.0	5.4	6.7
7 05	30.688	61.38	92.06	122.75	153.44	184.13	214.81	245.50	276.19	1841.3	3682.6	5523.8	7365.1	9206.4
6	.687	.38	.06	.75	.43	.12	.81	.50	.18	1.2	2.5	3.6	4.8	6.1
7	.686	.38	.06	.74	.43	.11	.80	.49	.17	1.1	2.3	3.4	4.6	5.7
8	.685	.37	.05	.74	.42	.11	.79	.48	.16	1.1	2.2	3.2	4.3	5.4
9	.683	.37	.05	.73	.42	.10	.79	.47	.15	1.0	2.0	3.0	4.1	5.0
7 10	30.682	61.37	92.05	122.73	153.41	184.09	214.78	245.46	276.14	1840.9	3681.9	5522.8	7363.8	9204.7
11	.681	.37	.04	.73	.41	.08	.77	.45	.13	0.8	1.8	2.6	3.5	4.4
12	.680	.36	.04	.72	.40	.08	.76	.44	.12	0.8	1.6	2.4	3.2	4.0
13	.679	.36	.04	.72	.40	.07	.76	.43	.11	0.7	1.4	2.2	3.0	3.7
14	.678	.36	.03	.71	.39	.07	.75	.42	.10	0.7	1.3	2.0	2.7	3.3
7 15	30.677	61.35	92.03	122.71	153.39	184.06	214.74	245.41	276.09	1840.6	3681.2	5521.8	7362.4	9203.0
16	.676	.35	.03	.70	.38	.05	.73	.41	.08	0.5	1.1	1.6	2.1	2.7
17	.675	.35	.02	.70	.38	.05	.72	.40	.07	0.5	0.9	1.4	1.9	2.4
18	.673	.35	.02	.69	.37	.04	.72	.39	.06	0.4	0.8	1.2	1.6	2.0
19	.672	.34	.02	.69	.37	.04	.71	.38	.05	0.4	0.6	1.0	1.4	1.7
7 20	30.671	61.34	92.01	122.68	153.36	184.03	214.70	245.37	276.04	1840.3	3680.5	5520.8	7361.1	9201.4
21	.670	.34	.01	.68	.35	.02	.69	.36	.03	0.2	0.4	0.6	0.8	1.0
22	.669	.34	.01	.67	.35	.01	.68	.35	.02	0.1	0.2	0.4	0.5	0.7
23	.668	.33	.00	.67	.34	.01	.68	.34	.01	0.1	80.1	0.2	0.3	0.3
24	.667	.33	.00	66	.34	4.00	.67	.33	6.00	40.0	79.9	20.0	60.0	200.0
7 25	30.665	61.33	92.00	122.66	153.33	183.99	214.66	245.32	275.99	1839.9	3679.8	5519.8	7359.7	9199.6
26	.664	.33	1.99	.66	.32	.99	.65	.32	.98	9.9	9.7	9.6	9.4	9.3
27	.663	.33	.99	.65	.32	.98	.64	.31	.97	9.8	9.6	9.4	9.1	8.9
28	.662	.32	.99	.65	.31	.97	.64	.30	.96	9.7	9.4	9.1	8.9	8.6
29	.661	.32	.98	.64	.31	.97	.63	.29	.95	9.7	9.3	8.9	8.6	8.2
7 30	30.660	61.32	91.98	122.64	153.30	183.96	214.62	245.28	275.94	1839.6	3679.2	5518.7	7358.3	9197.9
31	.658	.32	.98	.64	.29	.95	.61	.27	.93	9.5	9.0	8.5	8.0	7.5
32	.657	.32	.97	.63	.29	.94	.60	.26	.92	9.4	8.9	8.3	7.7	7.2
33	.656	.31	.97	.63	.28	.94	.59	.25	.91	9.4	8.7	8.1	7.5	6.8
34	.655	.31	.96	.62	.28	.93	.58	.24	.90	9.3	8.6	7.9	7.2	6.5
7 35	30.654	61.31	91.96	122.62	153.27	183.92	214.57	245.23	275.88	1839.2	3678.4	5517.7	7356.9	9196.1
36	.653	.31	.96	.61	.26	.92	.57	.22	.87	9.2	8.3	7.5	6.6	5.8
37	.651	.31	.95	.61	.26	.91	.56	.21	.86	9.1	8.1	7.3	6.3	5.4
38	.650	.30	.95	.60	.25	.90	.55	.20	.85	9.0	8.0	7.0	6.1	5.1
39	.649	.30	.95	.60	.25	.90	.54	.19	.84	9.0	7.8	6.8	5.8	4.7
7 40	30.648	61.30	91.94	122.59	153.24	183.89	214.53	245.18	275.83	1838.9	3677.7	5516.6	7355.5	9194.4
41	.647	.30	.94	.59	.23	.88	.52	.17	.82	8.8	7.6	6.4	5.2	4.0
42	.645	.29	.94	.58	.23	.87	.51	.16	.81	8.7	7.4	6.2	4.9	3.6
43	.644	.29	.93	.58	.22	.87	.51	.15	.80	8.7	7.3	5.9	4.6	3.3
44	.643	.29	.93	.57	.22	.86	.50	.14	.79	8.6	7.1	5.7	4.3	2.9
7 45	30.642	61.28	91.92	122.57	153.21	183.85	214.49	245.13	275.77	1838.5	3677.0	5515.5	7354.0	9192.5
46	.640	.28	.92	.56	.20	.84	.48	.13	.76	8.4	6.9	5.3	3.7	2.1
47	.639	.28	.92	.56	.20	.83	.47	.12	.75	8.3	6.7	5.1	3.4	1.8
48	.638	.28	.91	.55	.19	.83	.47	.11	.74	8.3	6.6	4.8	3.2	1.4
49	.637	.27	.91	.55	.19	.82	.46	.10	.73	8.2	6.4	4.6	2.9	1.1
7 50	30.636	61.27	91.91	122.54	153.18	183.81	214.45	245.09	275.72	1838.1	3676.3	5514.4	7352.6	9190.7
51	.634	.27	.90	.54	.17	.80	.44	.08	.71	8.0	6.1	4.2	2.3	0.3
52	.633	.27	.90	.53	.17	.80	.43	.07	.70	8.0	6.0	4.0	2.0	90.0
53	.632	.26	.90	.53	.16	.79	.42	.06	.69	7.9	5.8	3.7	1.7	89.6
54	.631	.26	.89	.52	.16	.79	.41	.05	.68	7.9	5.7	3.5	1.4	9.3
7 55	30.630	61.26	91.89	122.52	153.15	183.78	214.40	245.04	275.66	1837.8	3675.5	5513.3	7351.1	9188.9
56	.628	.26	.89	.51	.14	.77	.40	.03	.65	7.7	5.4	3.1	0.8	8.5
57	.627	.26	.88	.51	.14	.76	.39	.02	.64	7.6	5.2	2.9	0.5	8.1
58	.626	.25	.88	.50	.13	.76	.38	.01	.63	7.6	5.1	2.6	50.2	7.8
59	.625	.25	.87	.50	.13	.75	.37	5.00	.62	7.5	4.9	2.4	49.9	7.4
7 60	30.623	61.25	91.87	122.49	153.12	183.74	214.36	244.99	275.61	1837.4	3674.8	5512.2	7349.6	9187.0

Lat.	Latitude 7° to 8°—Meridional arcs.						Latitude 7°—Co-ordinates of curvature.		
	Value of 1″	Sums of seconds for middle latitude 7° 30′		Value of 1′	Continuous sums of minutes from latitude 7° 00′		Longitude.	X	Y
° ′	*Meters.*	″	*Meters.*	*Meters.*	′	*Meters.*	° ′	*Meters.*	*Meters.*
7 00	30.718			1843.06					
1	8	1	30.72	.07	1	1 843.1	0 1	1 841.6	
2	8	2	61.44	.07	2	3 686.1	2	3 683.2	0.1
3	8	3	92.16	.07	3	5 529.2	3	5 524.8	0.3
4	8	4	122.87	.07	4	7 372.3	4	7 366.4	0.5
7 05	30.718	5	153.59	1843.07	5	9 215.3	0 5	9 208.0	0.8
6	8	6	184.31	.07	6	11 058.4	6	11 049.7	1.2
7	8	7	215.03	.07	7	12 901.5	7	12 891.3	1.6
8	8	8	245.75	.08	8	14 744.6	8	14 732.9	2.1
9	8	9	276.47	.08	9	16 587.6	9	16 574.5	2.6
7 10	30.718	10	307.18	1843.08	10	18 430.7	0 10	18 416.1	3.3
11	8	1	337.90	.08	1	20 273.8	15	27 624.1	7.3
12	8	2	368.62	.08	2	22 116.9	20	36 832.1	13.1
13	8	3	399.34	.08	3	23 960.0	25	46 040.2	20.4
14	8	4	430.06	.08	4	25 803.0	30	55 248.2	29.4
7 15	30.718	15	460.78	1843.09	15	27 646.1	0 35	64 456.2	40.0
16	8	6	491.49	.09	6	29 489.2	40	73 664.3	52.2
17	8	7	522.21	.09	7	31 332.3	45	82 872.3	66.1
18	8	8	552.93	.09	8	33 175.4	50	92 080.3	81.6
19	8	9	583.65	.09	9	35 018.5	55	101 288.3	98.7
7 20	30.718	20	614.37	1843.09	20	36 861.6	1 00	110 496.4	117.5
21	8	1	645.09	.09	1	38 704.7	05	119 704.4	137.9
22	8	2	675.81	.10	2	40 547.8	10	128 912.4	160.0
23	8	3	706.52	.10	3	42 390.9	15	138 120.4	183.6
24	8	4	737.24	.10	4	44 234.0	20	147 328.4	208.9
7 25	30.718	25	767.96	1843.10	25	46 077.1	1 25	156 536.4	235.8
26	8	6	798.68	.10	6	47 920.2	30	165 744.4	264.4
27	8	7	829.40	.10	7	49 763.3	35	174 952.4	294.6
28	8	8	860.12	.10	8	51 606.4	40	184 160.4	326.4
29	8	9	890.83	.10	9	53 449.5	45	193 368.4	359.9
7 30	30.718	30	921.55	1843.11	30	55 292.6	1 50	202 576.3	395.0
31	8	1	952.27	.11	1	57 135.7	55	211 784.3	431.7
32	8	2	982.99	.11	2	58 978.8	2 00	220 992	470
33	8	3	1 013.71	.11	3	60 821.9	3 00	331 487	1 058
34	8	4	1 044.43	.11	4	62 665.0	4 00	441 981	1 880
7 35	30.719	35	1 075.15	1843.11	35	64 508.1	5 00	552 472	2 938
36	9	6	1 105.86	.11	6	66 351.2	6 00	662 961	4 231
37	9	7	1 136.58	.11	7	68 194.4	7 00	773 447	5 758
38	9	8	1 167.30	.11	8	70 037.5	8 00	883 929	7 521
39	9	9	1 198.02	.12	9	71 880.6	9 00	994 407	9 519
7 40	30.719	40	1 228.74	1843.12	40	73 723.7	10 00	1 104 881	11 751
41	9	1	1 259.46	.12	1	75 566.8	11 00	1 215 350	14 218
42	9	2	1 290.17	.12	2	77 409.9	12 00	1 325 813	16 921
43	9	3	1 320.89	.12	3	79 253.1	13 00	1 436 271	19 859
44	9	4	1 351.61	.12	4	81 096.2	14 00	1 546 722	23 031
7 45	30.719	45	1 382.33	1843.13	45	82 939.3	15 00	1 657 166	26 438
46	9	6	1 413.05	.13	6	84 782.4	16 00	1 767 602	30 080
47	9	7	1 443.77	.13	7	86 625.6	17 00	1 878 030	33 958
48	9	8	1 474.48	.13	8	88 468.7	18 00	1 988 450	38 070
49	9	9	1 505.20	.13	9	90 311.8	19 00	2 098 861	42 417
7 50	30.719	50	1 535.92	1843.13	50	92 155.0	20 00	2 209 263	46 999
51	9	1	1 566.64	.13	1	93 998.1	21 00	2 319 654	51 815
52	9	2	1 597.36	.14	2	95 841.2	22 00	2 430 035	56 866
53	9	3	1 628.08	.14	3	97 684.4	23 00	2 540 405	62 152
54	9	4	1 658.80	.14	4	99 527.5	24 00	2 650 764	67 673
7 55	30.719	55	1 689.51	1843.14	55	101 370.7	25 00	2 761 111	73 429
56	9	6	1 720.23	.14	6	103 213.8	26 00	2 871 444	79 420
57	9	7	1 750.95	.14	7	105 056.9	27 00	2 981 766	85 644
58	9	8	1 781.67	.15	8	106 900.1	28 00	3 092 073	92 103
59	9	9	1 812.39	.15	9	108 743.2	29 00	3 202 367	98 797
7 60	30.719	60	1 843.11	1843.15	60	110 586.4	30 00	3 312 646	105 727

Latitude 8° to 9°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
8 00	30.623	61.25	91.87	122.49	153.12	183.74	214.36	244.99	275.61	1837.4	3674.8	5512.2	7349.6	9187.0
1	.622	.25	.87	.49	.11	.73	.35	.98	.60	7.3	4.7	2.0	9.3	6.6
2	.621	.24	.86	.48	.11	.72	.34	.97	.59	7.2	4.5	1.8	9.0	6.2
3	.620	.24	.86	.48	.10	.72	.34	.96	.58	7.2	4.4	1.5	8.7	5.9
4	.618	.24	.85	.47	.09	.71	.33	.95	.57	7.1	4.2	1.3	8.4	5.5
8 05	30.617	61.23	91.85	122.47	153.08	183.70	214.32	244.94	275.55	1837.0	3674.1	5511.1	7348.1	9185.1
6	.616	.23	.85	.46	.08	.69	.31	.93	.54	6.9	3.9	0.9	7.8	4.7
7	.615	.23	.84	.46	.07	.69	.30	.92	.53	6.9	3.8	0.7	7.5	4.4
8	.613	.23	.84	.45	.06	.68	.29	.91	.52	6.8	3.6	0.4	7.2	4.0
9	.612	.22	.84	.45	.06	.68	.29	.90	.51	6.8	3.5	0.2	6.9	3.7
8 10	30.611	61.22	91.83	122.44	153.05	183.67	214.28	244.89	275.50	1836.7	3673.3	5510.0	7346.6	9183.3
11	.610	.22	.83	.44	.04	.66	.27	.88	.49	6.6	3.1	09.8	6.3	2.9
12	.608	.22	.82	.43	.04	.65	.26	.87	.48	6.5	3.0	9.5	6.0	2.5
13	.607	.21	.82	.43	.03	.65	.25	.86	.46	6.5	2.8	9.3	5.7	2.1
14	.606	.21	.82	.42	.03	.64	.24	.85	.45	6.4	2.7	9.0	5.4	1.7
8 15	30.604	61.21	91.81	122.42	153.02	183.63	214.23	244.83	275.44	1836.3	3672.5	5508.8	7345.1	9181.3
16	.603	.21	.81	.41	.01	.62	.23	.82	.43	6.2	2.4	8.6	4.8	0.9
17	.602	.21	.80	.41	.01	.61	.22	.81	.42	6.1	2.2	8.4	4.5	0.5
18	.601	.20	.80	.40	.00	.61	.21	.80	.40	6.1	2.1	8.1	4.1	80.2
19	.599	.20	.80	.40	3.00	.60	.20	.79	.39	6.0	1.9	7.9	3.8	79.8
8 20	30.598	61.20	91.79	122.39	152.99	183.59	214.19	244.78	275.38	1835.9	3671.8	5507.7	7343.5	9179.4
21	.597	.20	.79	.39	.98	.58	.18	.77	.37	5.8	1.6	7.5	3.2	9.0
22	.595	.19	.79	.38	.98	.57	.17	.76	.36	5.7	1.5	7.2	2.9	8.6
23	.594	.19	.78	.38	.97	.57	.16	.75	.35	5.7	1.3	7.0	2.6	8.3
24	.593	.19	.78	.37	.97	.56	.15	.74	.34	5.6	1.2	6.7	2.3	7.9
8 25	30.592	61.18	91.77	122.37	152.96	183.55	214.14	244.73	275.32	1835.5	3671.0	5506.5	7342.0	9177.5
26	.590	.18	.77	.36	.95	.54	.14	.72	.31	5.4	0.8	6.3	1.7	7.1
27	.589	.18	.77	.36	.95	.53	.13	.71	.30	5.3	0.7	6.0	1.4	6.7
28	.588	.18	.76	.35	.94	.53	.12	.70	.29	5.3	0.5	5.8	1.0	6.3
29	.586	.17	.76	.35	.94	.52	.11	.69	.28	5.2	0.4	5.5	0.7	5.9
8 30	30.585	61.17	91.76	122.34	152.93	183.51	214.10	244.68	275.27	1835.1	3670.2	5505.3	7340.4	9175.5
31	.584	.17	.75	.34	.92	.50	.09	.67	.26	5.0	70.0	5.1	40.1	5.1
32	.582	.16	.75	.33	.92	.49	.08	.66	.25	4.9	69.9	4.8	39.8	4.7
33	.581	.16	.74	.33	.91	.49	.07	.65	.23	4.9	9.7	4.6	9.4	4.3
34	.580	.16	.74	.32	.90	.48	.06	.64	.22	4.8	9.6	4.3	9.1	3.9
8 35	30.578	61.15	91.74	122.32	152.89	183.47	214.05	244.62	275.21	1834.7	3669.4	5504.1	7338.8	9173.5
36	.577	.15	.73	.31	.89	.46	.04	.61	.20	4.6	9.2	3.9	8.5	3.1
37	.576	.15	.73	.31	.88	.45	.03	.60	.19	4.5	9.1	3.6	8.2	2.7
38	.574	.15	.72	.30	.87	.45	.02	.59	.17	4.5	8.9	3.4	7.8	2.3
39	.573	.14	.72	.30	.87	.44	.01	.58	.16	4.4	8.8	3.1	7.5	1.9
8 40	30.572	61.14	91.72	122.29	152.86	183.43	214.00	244.57	275.15	1834.3	3668.6	5502.9	7337.2	9171.5
41	.570	.14	.71	.28	.85	.42	3.99	.56	.14	4.2	8.4	2.7	6.9	1.1
42	.569	.14	.71	.28	.85	.41	.98	.55	.12	4.1	8.3	2.4	6.6	0.7
43	.568	.13	.70	.27	.84	.41	.97	.54	.11	4.1	8.1	2.2	6.2	70.3
44	.566	.13	.70	.27	.83	.40	.96	.53	.10	4.0	8.0	1.9	5.9	69.9
8 45	30.565	61.13	91.70	122.26	152.82	183.39	213.95	244.51	275.09	1833.9	3667.8	5501.7	7335.6	9169.5
46	.564	.13	.69	.25	.82	.38	.95	.50	.07	3.8	7.6	1.5	5.3	9.1
47	.562	.13	.69	.25	.81	.37	.94	.49	.06	3.7	7.5	1.2	4.9	8.7
48	.561	.12	.68	.24	.80	.36	.93	.48	.05	3.6	7.3	1.0	4.6	8.2
49	.559	.12	.68	.24	.80	.36	.92	.47	.03	3.6	7.2	0.7	4.2	7.8
8 50	30.558	61.12	91.67	122.23	152.79	183.35	213.91	244.46	275.02	1833.5	3667.0	5500.5	7333.9	9167.4
51	.557	.12	.67	.23	.78	.34	.90	.45	.01	3.4	6.8	0.2	3.6	7.0
52	.555	.11	.67	.22	.78	.33	.89	.44	5.00	3.3	6.6	5500.0	3.3	6.6
53	.554	.11	.66	.22	.77	.33	.88	.43	4.98	3.3	6.5	499.7	2.9	6.1
54	.552	.11	.66	.21	.76	.32	.87	.42	.97	3.2	6.3	9.5	2.6	5.7
8 55	30.551	61.10	91.65	122.21	152.75	183.31	213.86	244.40	274.96	1833.1	3666.1	5499.2	7332.3	9165.3
56	.550	.10	.65	.20	.75	.30	.85	.39	.95	3.0	5.9	9.0	2.0	4.9
57	.548	.10	.64	.20	.74	.29	.84	.38	.94	2.9	5.8	8.7	1.6	4.5
58	.547	.10	.64	.19	.73	.28	.83	.37	.92	2.8	5.6	8.5	1.3	4.1
59	.546	.09	.64	.19	.73	.28	.82	.36	.91	2.8	5.5	8.2	0.9	3.7
8 60	30.544	61.09	91.63	122.18	152.72	183.27	213.81	244.35	274.90	1832.7	3665.3	5498.0	7330.6	9163.3

Lat.		Latitude 8° to 9°—Meridional arcs.						Latitude 8°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 8° 30′		Value of 1′	Continuous sums of minutes from latitude 8° 00′		Longitude.	X	Y
°	′	*Meters.*	″	*Meters.*	*Meters.*	′	*Meters.*	° ′	*Meters.*	*Meters.*
8	00	30.719			1843.15					
	1	9	1	30.72	.15	1	1 843.2	0 1	1 837.4	
	2	9	2	61.44	.15	2	3 686.3	2	3 674.8	0.1
	3	9	3	92.16	.16	3	5 529.5	3	5 512.2	0.3
	4	9	4	122.88	.16	4	7 372.6	4	7 349.6	0.6
8	05	30.719	5	153.60	1843.16	5	9 215.8	0 5	9 187.0	0.9
	6	9	6	184.32	.16	6	11 058.9	6	11 024.4	1.3
	7	9	7	215.04	.16	7	12 902.1	7	12 861.9	1.8
	8	9	8	245.76	.16	8	14 745.3	8	14 699.3	2.4
	9	9	9	276.48	.16	9	16 588.4	9	16 536.7	3.0
8	10	30.719	10	307.20	1843.17	10	18 431.6	0 10	18 374.1	3.7
	11	9	1	337.92	.17	1	20 274.8	15	27 561.1	8.4
	12	19	2	368.64	.17	2	22 117.9	20	36 748.2	14.9
	13	20	3	399.36	.17	3	23 961.1	25	45 935.2	23.2
	14	0	4	430.08	.17	4	25 804.3	30	55 122.3	33.5
8	15	30.720	15	460.80	1843.17	15	27 647.4	0 35	64 309.3	45.6
	16	0	6	491.52	.17	6	29 490.6	40	73 496.4	59.5
	17	0	7	522.24	.18	7	31 333.8	45	82 683.4	75.3
	18	0	8	552.96	.18	8	33 177.0	50	91 870.4	93.0
	19	0	9	583.68	.18	9	35 020.2	55	101 057.5	112.5
8	20	30.720	20	614.40	1843.18	20	36 863.3	1 00	110 244.5	133.9
	21	0	1	645.12	.18	1	38 706.5	05	119 431.5	157.1
	22	0	2	675.84	.18	2	40 549.7	10	128 618.5	182.2
	23	0	3	706.56	.19	3	42 392.9	15	137 805.5	209.2
	24	0	4	737.28	.19	4	44 236.1	20	146 992.5	238.0
8	25	30.720	25	768.00	1843.19	25	46 079.3	1 25	156 179.5	268.7
	26	0	6	798.72	.19	6	47 922.5	30	165 366.5	301.3
	27	0	7	829.44	.19	7	49 765.6	35	174 553.4	335.7
	28	0	8	860.16	.19	8	51 608.8	40	183 740.4	371.9
	29	0	9	890.88	.19	9	53 452.0	45	192 927.4	410.0
8	30	30.720	30	921.60	1843.20	30	55 295.2	1 50	202 114.3	450.0
	31	0	1	952.32	.20	1	57 138.4	55	211 301.3	491.9
	32	0	2	983.04	.20	2	58 981.6	2 00	220 488	536
	33	0	3	1 013.76	.20	3	60 824.8	3 00	330 730	1 205
	34	0	4	1 044.48	.20	4	62 668.0	4 00	440 971	2 142
8	35	30.720	35	1 075.20	1843.20	35	64 511.2	5 00	551 209	3 347
	36	0	6	1 105.92	.20	6	66 354.4	6 00	661 444	4 820
	37	0	7	1 136.64	.21	7	68 197.6	7 00	771 675	6 561
	38	0	8	1 167.36	.21	8	70 040.8	8 00	881 901	8 569
	39	0	9	1 198.08	.21	9	71 884.0	9 00	992 122	10 845
8	40	30.720	40	1 228.80	1843.21	40	73 727.2	10 00	1 102 337	13 389
	41	0	1	1 259.52	.21	1	75 570.4	11 00	1 212 546	16 200
	42	0	2	1 290.24	.21	2	77 413.6	12 00	1 322 747	19 279
	43	0	3	1 320.96	.22	3	79 256.8	13 00	1 432 940	22 626
	44	0	4	1 351.68	.22	4	81 100.1	14 00	1 543 126	26 240
8	45	30.720	45	1 382.40	1843.22	45	82 943.3	15 00	1 653 302	30 123
	46	0	6	1 413.12	.22	6	84 786.5	16 00	1 763 469	34 274
	47	0	7	1 443.84	.22	7	86 629.7	17 00	1 873 626	38 692
	48	0	8	1 474.56	.22	8	88 472.9	18 00	1 983 771	43 378
	49	0	9	1 505.28	.22	9	90 316.2	19 00	2 093 904	48 330
8	50	30.720	50	1 536.00	1843.23	50	92 159.4	20 00	2 204 024	53 548
	51	0	1	1 566.72	.23	1	94 002.6	21 00	2 314 131	59 034
	52	0	2	1 597.44	.23	2	95 845.9	22 00	2 424 225	64 789
	53	1	3	1 628.16	.23	3	97 689.1	23 00	2 534 305	70 811
	54	1	4	1 658.88	.23	4	99 532.3	24 00	2 644 370	77 101
8	55	30.721	55	1 689.60	1843.23	55	101 375.6	25 00	2 754 420	83 658
	56	1	6	1 720.32	.24	6	103 218.8	26 00	2 864 454	90 482
	57	1	7	1 751.04	.24	7	105 062.0	27 00	2 974 470	97 573
	58	1	8	1 781.76	.24	8	106 905.3	28 00	3 084 468	104 932
	59	1	9	1 812.48	.24	9	108 748.5	29 00	3 194 449	112 558
8	60	30.721	60	1 843.20	1843.24	60	110 591.8	30 00	3 304 411	120 451

Latitude 9° to 10°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
9 00	30.544	61.09	91.63	122.18	152.72	183.27	213.81	244.35	274.90	1832.7	3665.3	5498.0	7330.6	9163.3
1	.543	.09	.63	.17	.71	.26	.80	.34	.89	2.6	5.1	7.7	30.3	2.9
2	.541	.08	.62	.17	.71	.25	.79	.33	.87	2.5	5.0	7.5	29.9	2.4
3	.540	.08	.62	.16	.70	.24	.78	.32	.86	2.4	4.8	7.2	9.6	2.0
4	.538	.08	.61	.16	.69	.23	.77	.31	.85	2.3	4.7	7.0	9.2	1.5
9 05	30.537	61.07	91.61	122.15	152.68	183.22	213.76	244.29	274.83	1832.2	3664.5	5496.7	7328.9	9161.1
6	.536	.07	.61	.14	.68	.21	.75	.28	.82	2.1	4.3	6.4	8.6	0.7
7	.534	.07	.60	.14	.67	.21	.74	.27	.81	2.1	4.1	6.2	8.2	60.3
8	.533	.07	.60	.13	.66	.20	.73	.26	.80	2.0	4.0	5.9	7.9	59.8
9	.531	.06	.59	.13	.66	.19	.72	.25	.78	1.9	3.8	5.7	7.5	9.4
9 10	30.530	61.06	91.59	122.12	152.65	183.18	213.71	244.24	274.77	1831.8	3663.6	5495.4	7327.2	9159.0
11	.529	.06	.59	.11	.64	.17	.70	.23	.76	1.7	3.4	5.1	6.9	8.6
12	.527	.05	.58	.11	.64	.16	.69	.22	.74	1.6	3.3	4.9	6.5	8.2
13	.526	.05	.58	.10	.63	.15	.68	.21	.73	1.5	3.1	4.6	6.2	7.7
14	.524	.05	.57	.10	.62	.15	.67	.20	.72	1.5	3.0	4.4	5.8	7.3
9 15	30.523	61.04	91.57	122.09	152.61	183.14	213.66	244.18	274.70	1831.4	3662.8	5494.1	7325.5	9156.9
16	.522	.04	.57	.08	.61	.13	.65	.17	.69	1.3	2.6	3.8	5.2	6.5
17	.520	.04	.56	.08	.60	.12	.64	.16	.68	1.2	2.4	3.6	4.8	6.0
18	.519	.04	.56	.07	.59	.11	.63	.15	.67	1.1	2.3	3.3	4.5	5.6
19	.517	.03	.55	.07	.59	.10	.62	.14	.65	1.0	2.1	3.1	4.1	5.1
9 20	30.516	61.03	91.55	122.06	152.58	183.09	213.61	244.13	274.64	1830.9	3661.9	5492.8	7323.8	9154.7
21	.514	.03	.54	.05	.57	.08	.60	.12	.63	0.8	1.7	2.5	3.4	4.3
22	.513	.02	.54	.05	.57	.07	.59	.11	.61	0.7	1.5	2.3	3.1	3.8
23	.511	.02	.53	.04	.56	.07	.58	.09	.60	0.7	1.4	2.0	2.7	3.4
24	.510	.02	.53	.04	.55	.06	.57	.08	.59	0.6	1.2	1.8	2.4	2.9
9 25	30.508	61.01	91.53	122.03	152.54	183.05	213.56	244.07	274.57	1830.5	3661.0	5491.5	7322.0	9152.5
26	.507	.01	.52	.02	.54	.04	.55	.06	.56	0.4	0.8	1.2	1.7	2.1
27	.505	.01	.52	.02	.53	.03	.54	.05	.55	0.3	0.6	1.0	1.3	1.6
28	.504	.01	.51	.01	.52	.03	.53	.03	.54	0.3	0.5	0.7	1.0	1.2
29	.502	.00	.51	.01	.52	.02	.52	.02	.52	0.2	0.3	0.5	0.6	0.7
9 30	30.501	61.00	91.50	122.00	152.51	183.01	213.51	244.01	274.51	1830.1	3660.1	5490.2	7320.3	9150.3
31	.500	1.00	.50	1.99	.50	3.00	.50	4.00	.50	30.0	59.9	89.9	19.9	49.9
32	.498	0.99	.49	.99	.49	2.99	.49	3.99	.48	29.9	9.7	9.7	9.6	9.4
33	.497	.99	.49	.98	.49	.98	.48	.97	.47	9.8	9.6	9.4	9.2	9.0
34	.495	.99	.48	.98	.48	.97	.47	.96	.46	9.7	9.4	9.2	8.9	8.5
9 35	30.494	60.98	91.48	121.97	152.47	182.96	213.46	243.95	274.44	1829.6	3659.2	5488.9	7318.5	9148.1
36	.492	.98	.48	.96	.46	.96	.44	.94	.43	9.6	9.0	8.6	8.1	7.7
37	.491	.98	.47	.96	.45	.95	.43	.93	.42	9.5	8.9	8.3	7.8	7.2
38	.489	.98	.47	.95	.45	.94	.42	.91	.41	9.4	8.7	8.1	7.4	6.8
39	.488	.97	.46	.95	.44	.93	.41	.90	.39	9.3	8.6	7.8	7.1	6.3
9 40	30.486	60.97	91.46	121.94	152.43	182.92	213.40	243.89	274.38	1829.2	3658.4	5487.5	7316.7	9145.9
41	.485	.97	.45	.93	.42	.91	.39	.88	.37	9.1	8.2	7.2	6.3	5.4
42	.483	.96	.45	.93	.42	.90	.38	.87	.35	9.0	8.0	7.0	6.0	5.0
43	.482	.96	.45	.92	.41	.89	.37	.85	.34	8.9	7.8	6.7	5.6	4.5
44	.480	.96	.44	.92	.40	.88	.36	.84	.32	8.8	7.6	6.5	5.3	4.1
9 45	30.479	60.95	91.44	121.91	152.39	182.87	213.35	243.83	274.31	1828.7	3657.4	5486.2	7314.9	9143.6
46	.477	.95	.43	.90	.39	.86	.34	.82	.30	8.6	7.2	5.9	4.5	3.1
47	.476	.95	.43	.90	.38	.85	.33	.81	.28	8.5	7.0	5.6	4.2	2.7
48	.474	.95	.42	.89	.37	.85	.32	.79	.27	8.5	6.9	5.4	3.8	2.2
49	.473	.94	.42	.89	.37	.84	.31	.78	.25	8.4	6.7	5.1	3.5	1.8
9 50	30.471	60.94	91.41	121.88	152.36	182.83	213.30	243.77	274.24	1828.3	3656.5	5484.8	7313.1	9141.3
51	.469	.94	.41	.87	.35	.82	.29	.76	.23	8.2	6.3	4.5	2.7	0.8
52	.468	.93	.40	.87	.34	.81	.28	.75	.21	8.1	6.1	4.2	2.3	40.4
53	.466	.93	.40	.86	.34	.80	.27	.73	.20	8.0	6.0	4.0	2.0	39.9
54	.465	.93	.39	.86	.33	.79	.26	.72	.18	7.9	5.8	3.7	1.6	9.5
9 55	30.463	60.92	91.39	121.85	152.32	182.78	213.25	243.71	274.17	1827.8	3655.6	5483.4	7311.2	9139.0
56	.462	.92	.39	.84	.31	.77	.23	.70	.16	7.7	5.4	3.1	0.8	8.5
57	.460	.92	.38	.84	.30	.76	.22	.69	.14	7.6	5.2	2.8	0.5	8.1
58	.459	.92	.38	.83	.30	.75	.21	.67	.13	7.5	5.1	2.6	10.1	7.6
59	.457	.91	.37	.83	.29	.74	.20	.66	.11	7.4	4.9	2.3	09.8	7.2
9 60	30.456	60.91	91.37	121.82	152.28	182.73	213.19	243.65	274.10	1827.3	3654.7	5482.0	7309.4	9136.7

Lat.	Latitude 9° to 10°—Meridional arcs.						Latitude 9°—Co-ordinates of curvature.		
	Value of 1″	Sums of seconds for middle latitude 9° 30′		Value of 1′	Continuous sums of minutes from latitude 9° 00′		Longitude.	X	Y
° ′	*Meters.*	″	*Meters.*	*Meters.*	′	*Meters.*	° ′	*Meters.*	*Meters.*
9 00	30.721			1843.24					
1	1	1	30.72	.25	1	1 843.2	0 1	1 832.6	
2	1	2	61.44	.25	2	3 686.5	2	3 665.3	0.2
3	1	3	92.16	.25	3	5 529.7	3	5 498.0	0.4
4	1	4	122.89	.25	4	7 373.0	4	7 330.6	0.7
9 05	30.721	5	153.61	1843.25	5	9 216.2	0 5	9 163.3	1.0
6	1	6	184.33	.25	6	11 059.5	6	10 995.9	1.5
7	1	7	215.05	.26	7	12 902.8	7	12 828.6	2.0
8	1	8	245.77	.26	8	14 746.0	8	14 661.2	2.7
9	1	9	276.49	.26	9	16 589.3	9	16 493.9	3.4
9 10	30.721	10	307.22	1843.26	10	18 432.5	0 10	18 326.5	4.2
11	1	1	337.94	.26	1	20 275.8	15	27 489.8	9.4
12	1	2	368.66	.26	2	22 119.1	20	36 653.1	16.7
13	1	3	399.38	.27	3	23 962.3	25	45 816.4	26.1
14	1	4	430.10	.27	4	25 805.6	30	54 979.6	37.5
9 15	30.721	15	460.82	1843.27	15	27 648.9	0 35	64 142.9	51.1
16	1	6	491.55	.27	6	29 492.1	40	73 306.2	66.7
17	1	7	522.27	.27	7	31 335.4	45	82 469.4	84.4
18	1	8	552.99	.28	8	33 178.7	50	91 632.7	104.2
19	1	9	583.71	.28	9	35 022.0	55	100 795.9	126.1
9 20	30.721	20	614.43	1843.28	20	36 865.3	1 00	109 959.2	150.1
21	1	1	645.15	.28	1	38 708.5	05	119 122.4	176.2
22	1	2	675.88	.28	2	40 551.8	10	128 285.6	204.3
23	1	3	706.60	.28	3	42 395.1	15	137 448.9	234.6
24	1	4	737.32	.29	4	44 238.4	20	146 612.1	266.9
9 25	30.721	25	768.04	1843.29	25	46 081.7	1 25	155 775.3	301.3
26	1	6	798.76	.29	6	47 925.0	30	164 938.5	337.8
27	2	7	829.48	.29	7	49 768.3	35	174 101.7	376.3
28	2	8	860.21	.29	8	51 611.5	40	183 264.8	417.0
29	2	9	890.93	.29	9	53 454.8	45	192 428.0	459.7
9 30	30.722	30	921.65	1843.30	30	55 298.1	1 50	201 591.2	504.5
31	2	1	952.37	.30	1	57 141.4	55	210 754.3	551.4
32	2	2	983.09	.30	2	58 984.7	2 00	219 917	600
33	2	3	1 013.81	.30	3	60 828.0	3 00	329 874	1 351
34	2	4	1 044.53	.30	4	62 671.3	4 00	439 828	2 402
9 35	30.722	35	1 075.26	1843.31	35	64 514.6	5 00	549 779	3 753
36	2	6	1 105.98	.31	6	66 357.9	6 00	659 726	5 404
37	2	7	1 136.70	.31	7	68 201.2	7 00	769 668	7 355
38	2	8	1 167.42	.31	8	70 044.6	8 00	879 604	9 607
39	2	9	1 198.14	.31	9	71 887.9	9 00	989 534	12 158
9 40	30.722	40	1 228.86	1843.31	40	73 731.2	10 00	1 099 456	15 010
41	2	1	1 259.59	.32	1	75 574.5	11 00	1 209 370	18 162
42	2	2	1 290.31	.32	2	77 417.8	12 00	1 319 275	21 614
43	2	3	1 321.03	.32	3	79 261.1	13 00	1 429 171	25 367
44	2	4	1 351.75	.32	4	81 104.5	14 00	1 539 055	29 419
9 45	30.722	45	1 382.47	1843.32	45	82 947.8	15 00	1 648 928	33 770
46	2	6	1 413.19	.33	6	84 791.1	16 00	1 758 789	38 422
47	2	7	1 443.92	.33	7	86 634.4	17 00	1 868 637	43 374
48	2	8	1 474.64	.33	8	88 477.8	18 00	1 978 471	48 626
49	2	9	1 505.36	.33	9	90 321.1	19 00	2 088 289	54 178
9 50	30.722	50	1 536.08	1843.33	50	92 164.4	20 00	2 198 093	60 029
51	2	1	1 566.80	.33	1	94 007.7	21 00	2 307 880	66 180
52	2	2	1 597.52	.34	2	95 851.1	22 00	2 417 650	72 631
53	2	3	1 628.25	.34	3	97 694.4	23 00	2 527 402	79 382
54	2	4	1 658.97	.34	4	99 537.8	24 00	2 637 136	86 433
9 55	30.722	55	1 689.69	1843.34	55	101 381.1	25 00	2 746 848	93 783
56	2	6	1 720.41	.34	6	103 224.4	26 00	2 856 541	101 432
57	2	7	1 751.13	.35	7	105 067.8	27 00	2 966 213	109 381
58	2	8	1 781.85	.35	8	106 911.1	28 00	3 075 862	117 629
59	2	9	1 812.58	.35	9	108 754.4	29 00	3 185 488	126 177
9 60	30.723	60	1 843.30	1843.35	60	110 597.8	30 00	3 295 091	135 024

Latitude 10° to 11°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
10 00	30.456	60.91	91.37	121.82	152.28	182.73	213.19	243.65	274.10	1827.3	3654.7	5482.0	7309.4	9136.7
1	.454	.91	.36	.81	.27	.72	.18	.64	.09	7.2	4.5	1.7	9.0	6.2
2	.453	.90	.36	.81	.26	.71	.17	.62	.07	7.1	4.3	1.4	8.6	5.8
3	.451	.90	.35	.80	.26	.71	.16	.61	.06	7.1	4.1	1.2	8.3	5.3
4	.450	.90	.35	.80	.25	.70	.15	.60	.04	7.0	3.9	0.9	7.9	4.9
10 05	30.448	60.89	91.34	121.79	152.24	182.69	213.13	243.58	274.03	1826.9	3653.7	5480.6	7307.5	9134.4
6	.446	.89	.34	.78	.23	.68	.12	.57	.02	6.8	3.5	0.3	7.1	3.9
7	.445	.89	.33	.78	.22	.67	.11	.56	4.00	6.7	3.3	80.0	6.7	3.4
8	.443	.89	.33	.77	.22	.66	.10	.55	3.99	6.6	3.2	79.8	6.4	3.0
9	.442	.88	.33	.77	.21	.65	.09	.53	.97	6.5	3.0	9.5	6.0	2.5
10 10	30.440	60.88	91.32	121.76	152.20	182.64	213.08	243.52	273.96	1826.4	3652.8	5479.2	7305.6	9132.0
11	.438	.88	.32	.75	.19	.63	.07	.51	.95	6.3	2.6	8.9	5.2	1.5
12	.437	.87	.31	.75	.18	.62	.06	.50	.93	6.2	2.4	8.6	4.8	1.0
13	.435	.87	.31	.74	.18	.61	.05	.48	.92	6.1	2.3	8.4	4.5	0.6
14	.434	.87	.30	.74	.17	.60	.04	.47	.90	6.0	2.1	8.1	4.1	30.1
10 15	30.432	60.86	91.30	121.73	152.16	182.59	213.02	243.46	273.89	1825.9	3651.9	5477.8	7303.7	9129.6
16	.430	.86	.29	.72	.15	.58	.01	.45	.88	5.8	1.7	7.5	3.3	9.1
17	.429	.86	.29	.72	.14	.57	3.00	.44	.86	5.7	1.5	7.2	2.9	8.7
18	.427	.86	.28	.71	.14	.57	2.99	.42	.85	5.7	1.3	7.0	2.6	8.2
19	.426	.85	.28	.71	.13	.56	.98	.41	.83	5.6	1.1	6.7	2.2	7.8
10 20	30.424	60.85	91.27	121.70	152.12	182.55	212.97	243.40	273.82	1825.5	3650.9	5476.4	7301.8	9127.3
21	.423	.85	.27	.69	.11	.54	.96	.39	.81	5.4	0.7	6.1	1.4	6.8
22	.421	.84	.26	.69	.10	.53	.95	.37	.79	5.3	0.5	5.8	1.0	6.3
23	.419	.84	.26	.68	.10	.52	.94	.36	.78	5.2	0.3	5.5	0.7	5.8
24	.418	.84	.25	.67	.09	.51	.93	.34	.76	5.1	50.1	5.2	300.3	5.3
10 25	30.416	60.83	91.25	121.67	152.08	182.50	212.91	243.33	273.75	1825.0	3649.9	5474.9	7299.9	9124.8
26	.414	.83	.24	.66	.07	.49	.90	.32	.73	4.9	9.7	4.6	9.5	4.3
27	.413	.83	.24	.65	.06	.48	.89	.30	.72	4.8	9.5	4.3	9.1	3.8
28	.411	.83	.23	.64	.06	.47	.88	.29	.70	4.7	9.4	4.0	8.7	3.4
29	.410	.82	.23	.64	.05	.46	.87	.27	.69	4.6	9.2	3.7	8.3	2.9
10 30	30.408	60.82	91.22	121.63	152.04	182.45	212.86	243.26	273.67	1824.5	3649.0	5473.4	7297.9	9122.4
31	.406	.82	.22	.62	.03	.44	.85	.25	.66	4.4	8.8	3.1	7.5	1.9
32	.405	.81	.21	.62	.02	.43	.84	.23	.64	4.3	8.6	2.8	7.1	1.4
33	.403	.81	.21	.61	.02	.42	.82	.22	.63	4.2	8.4	2.6	6.7	0.9
34	.401	.80	.20	.61	.01	.41	.81	.21	.61	4.1	8.2	2.3	6.3	20.4
10 35	30.400	60.80	91.20	121.60	152.00	182.40	212.80	243.20	273.60	1824.0	3648.0	5472.0	7295.9	9119.9
36	.398	.80	.19	.59	1.99	.39	.79	.18	.58	3.9	7.8	1.7	5.5	9.4
37	.396	.79	.19	.59	.98	.38	.78	.17	.57	3.8	7.6	1.4	5.1	8.9
38	.395	.79	.18	.58	.98	.37	.76	.16	.55	3.7	7.4	1.1	4.8	8.5
39	.393	.78	.18	.58	.97	.36	.75	.14	.54	3.6	7.2	0.8	4.4	8.0
10 40	30.392	60.78	91.17	121.57	151.96	182.35	212.74	243.13	273.52	1823.5	3647.0	5470.5	7294.0	9117.5
41	.390	.78	.17	.56	.95	.34	.73	.12	.51	3.4	6.8	70.2	3.6	7.0
42	.388	.77	.16	.56	.94	.33	.72	.10	.49	3.3	6.6	69.9	3.2	6.5
43	.387	.77	.16	.55	.93	.32	.70	.09	.48	3.2	6.4	9.6	2.8	6.0
44	.385	.77	.15	.54	.92	.31	.69	.08	.46	3.1	6.2	9.3	2.4	5.5
10 45	30.383	60.76	91.15	121.53	151.91	182.30	212.68	243.06	273.45	1823.0	3646.0	5469.0	7292.0	9115.0
46	.382	.76	.14	.53	.91	.29	.67	.05	.43	2.9	5.8	8.7	1.6	4.5
47	.380	.76	.14	.52	.90	.28	.66	.04	.42	2.8	5.6	8.4	1.2	4.0
48	.378	.76	.13	.51	.89	.27	.64	.03	.40	2.7	5.4	8.1	0.8	3.5
49	.377	.75	.13	.51	.88	.26	.63	.01	.39	2.6	5.2	7.8	0.4	3.0
10 50	30.375	60.75	91.12	121.50	151.87	182.25	212.62	243.00	273.37	1822.5	3645.0	5467.5	7290.0	9112.5
51	.373	.75	.12	.49	.86	.24	.61	2.99	.36	2.4	4.8	7.2	89.6	2.0
52	.372	.74	.11	.49	.85	.23	.60	.97	.34	2.3	4.6	6.9	9.2	1.5
53	.370	.74	.11	.48	.85	.22	.59	.96	.33	2.2	4.4	6.6	8.7	0.9
54	.368	.74	.10	.47	.84	.21	.58	.94	.31	2.1	4.2	6.3	8.3	10.4
10 55	30.366	60.73	91.10	121.47	151.83	182.20	212.56	242.93	273.30	1822.0	3644.0	5466.0	7287.9	9109.9
56	.365	.73	.09	.46	.82	.19	.55	.92	.28	1.9	3.8	5.7	7.5	9.4
57	.363	.73	.09	.45	.81	.18	.54	.90	.27	1.8	3.6	5.4	7.1	8.9
58	.361	.73	.08	.44	.81	.17	.53	.89	.25	1.7	3.4	5.0	6.7	8.4
59	.360	.72	.08	.44	.80	.16	.52	.87	.24	1.6	3.2	4.7	6.3	7.9
10 60	30.358	60.72	91.07	121.43	151.79	182.15	212.51	242.86	273.22	1821.5	3643.0	5464.4	7285.9	9107.4

Lat.		Latitude 10° to 11°—Meridional arcs.						Latitude 10°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 10° 30′		Value of 1′	Continuous sums of minutes from latitude 10° 00′		Longitude.	X	Y
°	′	*Meters.*	″	*Meters.*	*Meters.*	′	*Meters.*	° ′	*Meters.*	*Meters.*
10	00	30.723			1843.35					
	1	3	1	30.72	.35	1	1 843.4	0 1	1 827.3	
	2	3	2	61.45	.35	2	3 686.7	2	3 654.7	0.2
	3	3	3	92.17	.36	3	5 530.1	3	5 482.0	0.4
	4	3	4	122.89	.36	4	7 373.4	4	7 309.4	0.7
10	05	30.723	5	153.62	1843.36	5	9 216.8	0 5	9 136.7	1.2
	6	3	6	184.34	.36	6	11 060.1	6	10 964.1	1.7
	7	3	7	215.06	.36	7	12 903.5	7	12 791.4	2.3
	8	3	8	245.79	.37	8	14 746.9	8	14 618.7	3.0
	9	3	9	276.51	.37	9	16 590.2	9	16 446.1	3.7
10	10	30.723	10	307.23	1843.37	10	18 433.6	0 10	18 273.4	4.6
	1	3	1	337.96	.37	1	20 277.0	15	27 410.2	10.4
	2	3	2	368.68	.37	2	22 120.4	20	36 546.9	18.5
	3	3	3	399.41	.38	3	23 963.7	25	45 683.6	28.8
	4	3	4	430.13	.38	4	25 807.1	30	54 820.3	41.5
10	15	30.723	15	460.85	1843.38	15	27 650.5	0 35	63 957.0	56.5
	6	3	6	491.58	.38	6	29 493.9	40	73 093.7	73.8
	7	3	7	522.30	.38	7	31 337.3	45	82 230.4	93.5
	8	3	8	553.02	.39	8	33 180.7	50	91 367.1	115.4
	9	3	9	583.75	.39	9	35 024.0	55	100 503.8	139.6
10	20	30.723	20	614.47	1843.39	20	36 867.4	1 00	109 640.5	166.1
	1	3	1	645.19	.39	1	38 710.8	05	118 777.2	195.0
	2	3	2	675.92	.39	2	40 554.2	10	127 913.9	226.1
	3	3	3	706.64	.40	3	42 397.6	15	137 050.5	259.6
	4	3	4	737.36	.40	4	44 241.0	20	146 187.2	295.4
10	25	30.723	25	768.09	1843.40	25	46 084.4	1 25	155 323.8	333.4
	6	3	6	798.81	.40	6	47 927.8	30	164 460.5	373.8
	7	3	7	829.53	.40	7	49 771.2	35	173 597.1	416.5
	8	3	8	860.26	.41	8	51 614.6	40	182 733.7	461.5
	9	3	9	890.98	.41	9	53 458.0	45	191 870.3	508.8
10	30	30.723	30	921.70	1843.41	30	55 301.4	1 50	201 006.9	558.4
	1	3	1	952.43	.41	1	57 144.8	55	210 143.5	610.3
	2	4	2	983.15	.41	2	58 988.2	2 00	219 280	665
	3	4	3	1 013.87	.41	3	60 831.6	3 00	328 917	1 495
	4	4	4	1 044.60	.42	4	62 675.0	4 00	438 552	2 658
10	35	30.724	35	1 075.32	1843.42	35	64 518.5	5 00	548 182	4 154
	6	4	6	1 106.05	.42	6	66 361.9	6 00	657 808	5 981
	7	4	7	1 136.77	.42	7	68 205.3	7 00	767 427	8 140
	8	4	8	1 167.49	.42	8	70 048.7	8 00	877 040	10 632
	9	4	9	1 198.22	.43	9	71 892.2	9 00	986 644	13 457
10	40	30.724	40	1 228.94	1843.43	40	73 735.6	10 00	1,096,239	16 614
	1	4	1	1 259.66	.43	1	75 579.0	11 00	1 205 824	20 102
	2	4	2	1 290.39	.43	2	77 422.4	12 00	1 315 398	23 922
	3	4	3	1 321.11	.43	3	79 265.9	13 00	1 424 960	28 075
	4	4	4	1 351.83	.44	4	81 109.3	14 00	1 534 509	32 560
10	45	30.724	45	1 382.56	1843.44	45	82 952.7	15 00	1 644 044	37 375
	6	4	6	1 413.28	.44	6	84 796.2	16 00	1 753 564	42 522
	7	4	7	1 444.00	.44	7	86 639.6	17 00	1 863 067	48 002
	8	4	8	1 474.73	.44	8	88 483.1	18 00	1 972 554	53·815
	9	4	9	1 505.45	.45	9	90 326.5	19 00	2 082 022	59 962
10	50	30.724	50	1 536.17	1843.45	50	92 170.0	20 00	2 191 471	66 440
	1	4	1	1 566.90	.45	1	94 013.4	21 00	2 300 900	73 246
	2	4	2	1 597.62	.45	2	95 856.9	22 00	2 410 308	80 385
	3	4	3	1 628.34	.45	3	97 700.3	23 00	2 519 694	87 855
	4	4	4	1 659.07	.46	4	99 543.8	24 00	2 629 057	95 658
10	55	30.724	55	1 689.79	1843.46	55	101 387.2	25 00	2 738 395	103 792
	6	4	6	1 720.51	.46	6	103 230.7	26 00	2 847 709	112 256
	7	4	7	1 751.24	.46	7	105 074.1	27 00	2 956 996	121 053
	8	4	8	1 781.96	.46	8	106 917.6	28 00	3 066 256	130 180
	9	4	9	1 812.69	.47	9	108 761.1	29 00	3 175 488	139 639
10	60	30.724	60	1 843.41	1843.47	60	110 604.5	30 00	3 284 690	149 428

Latitude 11° to 12°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
11 00	30.358	60.72	91.07	121.43	151.79	182.15	212.51	242.86	273.22	1821.5	3643.0	5464.4	7285.9	9107.4
1	.356	.72	.07	.42	.78	.14	.50	.85	.21	1.4	2.8	4.1	5.5	6.9
2	.355	.71	.06	.42	.77	.13	.49	.83	.19	1.3	2.6	3.8	5.1	6.4
3	.353	.71	.06	.41	.76	.12	.47	.82	.18	1.2	2.3	3.5	4.7	5.8
4	.351	.70	.05	.40	575	.11	.46	.81	.16	1.1	2.1	3.2	4.3	5.3
11 05	30.349	60.70	91.05	121.39	151.74	182.10	212.45	242.79	273.15	1821.0	3641.9	5462.9	7283.9	9104.8
6	.348	.70	.04	.39	.74	.09	.44	.78	.13	0.9	1.7	2.6	3.5	4.3
7	.346	.69	.04	.38	.73	.08	.43	.77	.12	0.8	1.5	2.3	3.1	3.8
8	.344	.69	.03	.37	.72	.07	.41	.76	.10	0.7	1.3	2.0	2.6	3.3
9	.343	.68	.03	.37	.71	.06	.40	.74	.09	0.6	1.1	1.7	2.2	2.8
11 10	30.341	60.68	91.02	121.36	151.70	182.05	212.39	242.73	273.07	1820.5	3640.9	5461.4	7281.8	9102.3
11	.339	.68	.02	.35	.69	.04	.38	.72	.05	0.4	0.7	1.1	1.4	1.8
12	.337	.67	.01	.35	.68	.03	.36	.70	.04	0.3	0.5	0.8	1.0	1.2
13	.336	.67	.01	.34	.68	.01	.35	.69	.02	0.1	0.3	0.4	0.5	0.7
14	.334	.67	.00	.33	.67	2.00	.34	.67	3.01	20.0	40.1	60.1	80.1	100.1
11 15	30.332	60.66	91.00	121.32	151.66	181.99	212.32	242.66	272.99	1819.9	3639.9	5459.8	7279.7	9099.6
16	.330	.66	0.99	.32	.65	.98	.31	.65	.97	9.8	9.7	9.5	9.3	9.1
17	.329	.66	.99	.31	.64	.97	.30	.63	.96	9.7	9.5	9.2	8.9	8.6
18	.327	.66	.98	.30	.64	.96	.29	.62	.94	9.6	9.2	8.8	8.4	8.0
19	.325	.65	.98	.30	.63	.95	.27	.60	.93	9.5	9.0	8.5	8.0	7.5
11 20	30.323	60.65	90.97	121.29	151.62	181.94	212.26	242.59	272.91	1819.4	3638.8	5458.2	7277.6	9097.0
21	.322	.65	.97	.28	.61	.93	.25	.58	.89	9.3	8.6	7.9	7.2	6.5
22	.320	.64	.96	.28	.60	.92	.24	.56	.88	9.2	8.4	7.6	6.8	6.0
23	.318	.64	.95	.27	.59	.91	.22	.55	.86	9.1	8.1	7.2	6.3	5.4
24	.316	.63	.95	.26	.58	.90	.21	.53	.85	9.0	7.9	6.9	5.9	4.9
11 25	30.315	60.63	90.94	121.25	151.57	181.89	212.20	242.52	272.83	1818.9	3637.7	5456.6	7275.5	9094.4
26	.313	.63	.94	.25	.57	.88	.19	.51	.81	8.8	7.5	6.3	5.1	3.9
27	.311	.62	.93	.24	.56	.87	.18	.49	.80	8.7	7.3	6.0	4.7	3.3
28	.309	.62	.93	.23	.55	.85	.16	.48	.78	8.5	7.1	5.6	4.2	2.8
29	.307	.61	.92	.23	.54	.84	.15	.46	.77	8.4	6.9	5.3	3.8	2.2
11 30	30.306	60.61	90.92	121.22	151.53	181.83	212.14	242.45	272.75	1818.3	3636.7	5455.0	7273.4	9091.7
31	.304	.61	.91	.21	.52	.82	.13	.44	.73	8.2	6.5	4.7	3.0	1.2
32	.302	.60	.91	.21	.51	.81	.11	.42	.72	8.1	6.3	4.4	2.5	0.6
33	.300	.60	.90	.20	.50	.80	.10	.41	.70	8.0	6.0	4.0	2.1	90.1
34	.298	.60	.90	.19	.49	.79	.09	.39	.69	7.9	5.8	3.7	1.6	89.5
11 35	30.297	60.59	90.89	121.18	151.48	181.78	212.07	242.38	272.67	1817.8	3635.6	5453.4	7271.2	9089.0
36	.295	.59	.88	.18	.48	.77	.06	.36	.65	7.7	5.4	3.1	0.8	8.5
37	.293	.59	.88	.17	.47	.76	.05	.35	.64	7.6	5.2	2.8	70.4	7.9
38	.291	.59	.87	.16	.46	.75	.04	.33	.62	7.5	4.9	2.4	69.9	7.4
39	.289	.58	.87	.16	.45	.74	.02	.32	.61	7.4	4.7	2.1	9.5	6.8
11 40	30.288	60.58	90.86	121.15	151.44	181.73	212.01	242.30	272.59	1817.3	3634.5	5451.8	7269.1	9086.3
41	.286	.58	.86	.14	.43	.72	2.00	.29	.57	7.2	4.3	1.5	8.7	5.8
42	.284	.57	.85	.14	.42	.71	1.99	.27	.56	7.1	4.1	1.2	8.2	5.2
43	.282	.57	.85	.13	.41	.69	.97	.26	.54	6.9	3.8	0.8	7.8	4.7
44	.280	.56	.84	.12	.40	.68	.96	.24	.53	6.8	3.6	0.5	7.3	4.1
11 45	30.279	60.56	90.84	121.11	151.39	181.67	211.95	242.23	272.51	1816.7	3633.4	5450.2	7266.9	9083.6
46	.277	.56	.83	.11	.39	.66	.94	.22	.49	6.6	3.2	49.9	6.5	3.1
47	.275	.55	.83	.10	.38	.65	.93	.20	.48	6.5	3.0	9.5	6.0	2.5
48	.273	.55	.82	.09	.37	.64	.91	.19	.46	6.4	2.8	9.2	5.6	2.0
49	.271	.54	.81	.09	.36	.63	.90	.17	.45	6.3	2.6	8.8	5.1	1.4
11 50	30.270	60.54	90.81	121.08	151.35	181.62	211.89	242.16	272.43	1816.2	3632.4	5448.5	7264.7	9080.9
51	.268	.54	.80	.07	.34	.61	.88	.15	.41	6.1	2.2	8.2	4.3	80.3
52	.266	.53	.80	.06	.33	.60	.86	.13	.40	6.0	1.9	7.9	3.8	79.8
53	.264	.53	.79	.06	.32	.58	.85	.12	.38	5.8	1.7	7.5	3.4	9.2
54	.262	.52	.79	.05	.31	.57	.84	.10	.36	5.7	1.4	7.2	2.9	8.7
11 55	30.260	60.52	90.78	121.04	151.30	181.56	211.82	242.09	272.34	1815.6	3631.2	5446.9	7262.5	9078.1
56	.258	.52	.77	.03	.30	.55	.81	.07	.33	5.5	1.0	6.6	2.1	7.5
57	.257	.51	.77	.02	.29	.54	.80	.06	.31	5.4	0.8	6.2	1.6	7.0
58	.255	.51	.76	.02	.28	.53	.79	.04	.29	5.3	0.5	5.9	1.2	6.4
59	.253	.50	.76	.01	.27	.52	.77	.03	.28	5.2	0.3	5.5	0.7	5.9
11 60	30.251	60.50	90.75	121.00	151.26	181.51	211.76	242.01	272.26	1815.1	3630.1	5445.2	7260.3	9075.3

Lat.		Latitude 11° to 12°—Meridional arcs.						Latitude 11°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 11° 30′		Value of 1′	Continuous sums of minutes from latitude 11° 00′		Longitude.	X	Y
°	′	*Meters.*	″	*Meters.*	*Meters.*	′	*Meters.*	° ′	*Meters.*	*Meters.*
11	00	30.724			1843.47					
	1	4	1	30.73	.47	1	1 843.5	0 1	1 821.5	0.1
	2	5	2	61.45	.47	2	3 686.9	2	3 643.0	0.2
	3	5	3	92.18	.47	3	5 530.4	3	5 464.4	0.5
	4	5	4	122.90	.48	4	7 373.9	4	7 285.9	0.8
11	05	30.725	5	153.63	1843.48	5	9 217.4	0 5	9 107.4	1.3
	6	5	6	184.35	.48	6	11 060.8	6	10 928.9	1.8
	7	5	7	215.08	.48	7	12 904.3	7	12 750.4	2.5
	8	5	8	245.80	.49	8	14 747.8	8	14 571.8	3.2
	9	5	9	276.53	.49	9	16 591.3	9	16 393.3	4.1
11	10	30.725	10	307.26	1843.49	10	18 434.8	0 10	18 214.8	5.1
	11	5	1	337.98	.49	1	20 278.3	15	27 322.2	11.4
	12	5	2	368.71	.49	2	22 121.8	20	36 429.6	20.2
	13	5	3	399.43	.50	3	23 965.3	25	45 537.0	31.6
	14	5	4	430.16	.50	4	25 808.8	30	54 644.4	45.5
11	15	30.725	15	460.88	1843.50	15	27 652.3	0 35	63 751.8	61.9
	16	5	6	491.61	.50	6	29 495.8	40	72 859.2	80.9
	17	5	7	522.33	.50	7	31 339.3	45	81 966.5	102.4
	18	5	8	553.06	.51	8	33 182.8	50	91 073.9	126.4
	19	5	9	583.78	.51	9	35 026.3	55	100 181.3	152.9
11	20	30.725	20	614.51	1843.51	20	36 869.8	1 00	109 288.7	182.0
	21	5	1	645.24	.51	1	38 713.3	05	118 396.0	213.6
	22	5	2	675.96	.51	2	40 556.8	10	127 503.4	247.7
	23	5	3	706.69	.52	3	42 400.3	15	136 610.7	284.3
	24	5	4	737.41	.52	4	44 243.8	20	145 718.0	323.5
11	25	30.725	25	768.14	1843.52	25	46 087.3	1 25	154 825.3	365.2
	26	5	6	798.86	.52	6	47 930.9	30	163 932.7	409.4
	27	5	7	829.59	.52	7	49 774.4	35	173 039.9	456.2
	28	5	8	860.31	.53	8	51 617.9	40	182 147.2	505.5
	29	5	9	891.04	.53	9	53 461.4	45	191 254.5	557.3
11	30	30.726	30	921.77	1843.53	30	55 305.0	1 50	200 361.7	611.6
	31	6	1	952.49	.53	1	57 148.5	55	209 469.0	668.5
	32	6	2	983.22	.54	2	58 992.0	2 00	218 576	728
	33	6	3	1 013.94	.54	3	60 835.6	3 00	327 861	1 638
	34	6	4	1 044.67	.54	4	62 679.1	4 00	437 143	2 911
11	35	30.726	35	1 075.39	1843.54	35	64 522.7	5 00	546 419	4 549
	36	6	6	1 106.12	.54	6	66 366.2	6 00	655 690	6 551
	37	6	7	1 136.84	.55	7	68 209.8	7 00	764 953	8 916
	38	6	8	1 167.57	.55	8	70 053.3	8 00	874 208	11 646
	39	6	9	1 198.30	.55	9	71 896.9	9 00	983 453	14 739
11	40	30.726	40	1 229.02	1843.55	40	73 740.4	10 00	1 092 687	18 196
	41	6	1	1 259.75	.55	1	75 584.0	11 00	1 201 909	22 016
	42	6	2	1 290.47	.56	2	77 427.5	12 00	1 311 117	26 201
	43	6	3	1 321.20	.56	3	79 271.1	13 00	1 420 311	30 749
	44	6	4	1 351.92	.56	4	81 114.6	14 00	1 529 490	35 663
11	45	30.726	45	1 382.65	1843.56	45	82 958.2	15 00	1 638 652	40 937
	46	6	6	1 413.37	.57	6	84 801.8	16 00	1 747 795	46 577
	47	6	7	1 444.10	.57	7	86 645.3	17 00	1 856 919	52 579
	48	6	8	1 474.82	.57	8	88 488.9	18 00	1 966 022	58 944
	49	6	9	1 505.55	.57	9	90 332.5	19 00	2 075 104	65 674
11	50	30.726	50	1 536.28	1843.57	50	92 176.1	20 00	2 184 162	72 764
	51	6	1	1 567.00	.58	1	94 019.6	21 00	2 293 196	80 221
	52	6	2	1 597.73	.58	2	95 863.2	22 00	2 402 205	88 039
	53	6	3	1 628.45	.58	3	97 706.8	23 00	2 511 187	96 221
	54	6	4	1 659.18	.58	4	99 550.4	24 00	2 620 142	104 765
11	55	30.726	55	1 689.90	1843.58	55	101 394.0	25 00	2 729 067	113 671
	56	6	6	1 720.63	.59	6	103 237.6	26 00	2 837 962	122 940
	57	6	7	1 751.35	.59	7	105 081.1	27 00	2 946 825	132 573
	58	7	8	1 782.08	.59	8	106 924.7	28 00	3 055 656	142 569
	59	7	9	1 812.81	.59	9	108 768.3	29 00	3 164 453	152 926
11	60	30.727	60	1 843.53	1843.60	60	110 611.9	30 00	3 273 215	163 645

Latitude 12° to 13°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
12 00	30.251	60.50	90.75	121.00	151.26	181.51	211.76	242.01	272.26	1815.1	3630.1	5445.2	7260.3	9075.3
1	.249	.50	.75	120.99	.25	.50	.75	2.00	.24	5.0	29.9	4.9	59.8	4.7
2	.247	.49	.74	.99	.24	.49	.73	1.98	.23	4.9	9.7	4.5	9.4	4.2
3	.245	.49	.74	.98	.23	.47	.72	.97	.21	4.7	9.4	4.2	8.9	3.6
4	.244	.48	.73	.97	.22	.46	.71	.95	.19	4.6	9.2	3.8	8.5	3.1
12 05	30.242	60.48	90.73	120.96	151.21	181.45	211.69	241.93	272.17	1814.5	3629.0	5443.5	7258.0	9072.5
6	.240	.48	.72	.96	.20	.44	.68	.92	.16	4.4	8.8	3.2	7.6	1.9
7	.238	.47	.71	.95	.19	.43	.67	.90	.14	4.3	8.6	2.8	7.1	1.4
8	.236	.47	.71	.94	.18	.41	.66	.89	.12	4.1	8.3	2.5	6.7	0.8
9	.234	.46	.70	.94	.17	.40	.64	.87	.11	4.0	8.1	2.1	6.2	70.3
12 10	30.232	60.46	90.70	120.93	151.16	181.39	211.63	241.86	272.09	1813.9	3627.9	5441.8	7255.8	9069.7
11	.230	.46	.69	.92	.15	.38	.62	.85	.07	3.8	7.7	1.5	5.3	9.1
12	.229	.45	.69	.91	.14	.37	.60	.83	.06	3.7	7.4	1.1	4.9	8.6
13	.227	.45	.68	.91	.13	.36	.59	.82	.04	3.6	7.2	0.7	4.4	8.0
14	.225	.45	.68	.90	.12	.35	.57	.80	.02	3.5	6.9	0.3	4.0	7.5
12 15	30.223	60.44	90.67	120.89	151.12	181.34	211.56	241.78	272.00	1813.4	3626.7	5440.1	7253.5	9066.9
16	.221	.44	.66	.88	.11	.33	.55	.77	1.99	3.3	6.5	39.8	3.0	6.3
17	.219	.44	.66	.87	.10	.32	.53	.75	.97	3.2	6.3	9.4	2.6	5.7
18	.217	.44	.65	.87	.09	.30	.52	.74	.95	3.0	6.0	9.1	2.1	5.2
19	.215	.43	.65	.86	.08	.29	.50	.72	.94	2.9	5.8	8.7	1.7	4.6
12 20	30.213	60.43	90.64	120.85	151.07	181.28	211.49	241.71	271.92	1812.8	3625.6	5438.4	7251.2	9064.0
21	.211	.43	.63	.84	.06	.27	.48	.69	.90	2.7	5.4	8.1	0.7	3.4
22	.209	.42	.63	.84	.05	.26	.46	.68	.89	2.6	5.2	7.4	50.3	2.8
23	.208	.42	.62	.83	.04	.24	.45	.66	.87	2.4	4.9	7.7	49.8	2.3
24	.206	.41	.62	.82	.03	.23	.44	.65	.85	2.3	4.7	7.0	9.4	1.7
12 25	30.204	60.41	90.61	120.81	151.02	181.22	211.42	241.63	271.83	1812.2	3624.5	5436.7	7248.9	9061.1
26	.202	.41	.60	.81	.01	.21	.41	.61	.82	2.1	4.3	6.4	8.4	0.5
27	.200	.40	.60	.80	1.00	.20	.40	.60	.80	2.0	4.0	6.0	8.0	60.0
28	.198	.40	.59	.79	0.99	.19	.39	.58	.78	1.9	3.8	5.7	7.5	59.4
29	.196	.39	.59	.79	.98	.18	.37	.57	.77	1.8	3.5	5.3	7.1	8.9
12 30	30.194	60.39	90.58	120.78	150.97	181.17	211.36	241.55	271.75	1811.7	3623.3	5435.0	7246.6	9058.3
31	.192	.39	.58	.77	.96	.16	.35	.54	.73	1.6	3.1	4.6	6.1	7.7
32	.190	.38	.57	.76	.95	.15	.33	.52	.71	1.5	2.8	4.3	5.7	7.1
33	.188	.38	.56	.76	.94	.13	.32	.51	.70	1.3	2.6	3.9	5.2	6.5
34	.186	.37	.56	.75	.93	.12	.30	.49	.68	1.2	2.3	3.6	4.8	5.9
12 35	30.184	60.37	90.55	120.74	150.92	181.11	211.29	241.47	271.66	1811.1	3622.1	5433.2	7244.3	9055.3
36	.182	.37	.55	.73	.91	.10	.28	.46	.64	1.0	1.9	2.9	3.8	4.7
37	.180	.36	.54	.72	.90	.09	.26	.44	.62	0.9	1.7	2.5	3.3	4.1
38	.179	.36	.54	.72	.89	.07	.25	.43	.61	0.7	1.4	2.2	2.9	3.6
39	.177	.35	.53	.71	.88	.06	.23	.41	.59	0.6	1.2	1.8	2.4	3.0
12 40	30.175	60.35	90.52	120.70	150.87	181.05	211.22	241.40	271.57	1810.5	3621.0	5431.5	7241.9	9052.4
41	.173	.35	.52	.69	.86	.04	.21	.38	.55	0.4	0.8	1.1	1.4	1.8
42	.171	.34	.51	.68	.85	.03	.19	.37	.54	0.3	0.5	0.8	1.0	1.2
43	.169	.34	.51	.68	.84	.01	.18	.35	.52	0.1	0.3	0.4	0.5	0.7
44	.167	.33	.50	.67	.83	1.00	.17	.34	.50	10.0	20.0	30.1	40.1	50.1
12 45	30.165	60.33	90.50	120.66	150.83	180.99	211.15	241.32	271.48	1809.9	3619.8	5429.7	7239.6	9049.5
46	.163	.33	.49	.65	.82	.98	.14	.30	.47	9.8	9.6	9.3	9.1	8.9
47	.161	.32	.48	.64	.81	.97	.13	.29	.45	9.7	9.3	9.0	8.6	8.3
48	.159	.32	.48	.64	.80	.95	.12	.27	.43	9.5	9.1	8.6	8.2	7.7
49	.157	.31	.47	.63	.79	.94	.10	.26	.42	9.4	8.8	8.3	7.7	7.1
12 50	30.155	60.31	90.47	120.62	150.78	180.93	211.09	241.24	271.40	1809.3	3618.6	5427.9	7237.2	9046.5
51	.153	.31	.46	.61	.77	.92	.08	.22	.38	9.2	8.4	7.5	6.7	5.9
52	.151	.30	.45	.60	.76	.91	.06	.21	.36	9.1	8.1	7.2	6.2	5.3
53	.149	.30	.45	.60	.75	.89	.05	.19	.35	8.9	7.9	6.8	5.8	4.7
54	.147	.29	.44	.59	.74	.88	.03	.18	.33	8.8	7.6	6.5	5.3	4.1
12 55	30.145	60.29	90.44	120.58	150.73	180.87	211.02	241.16	271.31	1808.7	3617.4	5426.1	7234.8	9043.5
56	.143	.29	.43	.57	.72	.86	1.01	.14	.29	8.6	7.2	5.7	4.3	2.9
57	.141	.28	.42	.56	.71	.85	0.99	.13	.27	8.5	6.9	5.4	3.8	2.3
58	.139	.28	.42	.56	.70	.83	.98	.11	.26	8.3	6.7	5.0	3.4	1.7
59	.137	.27	.41	.55	.69	.82	.96	.10	.24	8.2	6.4	4.7	2.9	1.1
12 60	30.135	60.27	90.41	120.54	150.68	180.81	210.95	241.08	271.22	1808.1	3616.2	5424.3	7232.4	9040.5

Lat.		Latitude 12° to 13°—Meridional arcs.						Latitude 12°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 12° 30′		Value of 1′	Continuous sums of minutes from latitude 12° 00′		Longitude.	X	Y
°	′	*Meters.*	″	*Meters.*	*Meters.*	′	*Meters.*	° ′	*Meters.*	*Meters.*
12	00	30.727			1843.60					
	1	7	1	30.73	.60	1	1 843.6	0 1	1 815.1	0.1
	2	7	2	61.46	.60	2	3 687.2	2	3 630.1	0.2
	3	7	3	92.18	.60	3	5 530.8	3	5 445.2	0.5
	4	7	4	122.91	.60	4	7 374.4	4	7 260.3	0.9
12	05	30.727	5	153.64	1843.61	5	9 218.0	0 5	9 075.3	1.4
	6	7	6	184.37	.61	6	11 061.6	6	10 890.4	2.0
	7	7	7	215.09	.61	7	12 905.2	7	12 705.5	2.7
	8	7	8	245.82	.61	8	14 748.8	8	14 520.5	3.5
	9	7	9	276.55	.62	9	16 592.5	9	16 335.6	4.5
12	10	30.727	10	307.28	1843.62	10	18 436.1	0 10	18 150.7	5.5
	11	7	1	338.01	.62	1	20 279.7	15	27 226.0	12.4
	12	7	2	368.73	.62	2	22 123.3	20	36 301.3	22.0
	13	7	3	399.46	.62	3	23 966.9	25	45 376.7	34.3
	14	7	4	430.19	.63	4	25 810.6	30	54 452.0	49.4
12	15	30.727	15	460.92	1843.63	15	27 654.2	0 35	63 527.3	67.2
	16	7	6	491.64	.63	6	29 497.8	40	72 602.6	87.8
	17	7	7	522.37	.63	7	31 341.5	45	81 677.9	111.1
	18	7	8	553.10	.64	8	33 185.1	50	90 753.2	137.2
	19	7	9	583.83	.64	9	35 028.7	55	99 828.5	166.0
12	20	30.727	20	614.55	1843.64	20	36 872.4	1 00	108 903.8	197.6
	21	7	1	645.28	.64	1	38 716.0	05	117 979.0	231.9
	22	7	2	676.01	.65	2	40 559.7	10	127 054.3	268.9
	23	7	3	706.74	.65	3	42 403.3	15	136 129.6	308.7
	24	7	4	737.47	.65	4	44 247.0	20	145 204.8	351.3
12	25	30.728	25	768.19	1843.65	25	46 090.6	1 25	154 280.0	396.6
	26	8	6	798.92	.65	6	47 934.3	30	163 355.2	444.6
	27	8	7	829.65	.66	7	49 777.9	35	172 430.4	495.4
	28	8	8	860.38	.66	8	51 621.6	40	181 505.6	548.9
	29	8	9	891.10	.66	9	53 465.3	45	190 580.7	605.1
12	30	30.728	30	921.83	1843.66	30	55 308.9	1 50	199 655.9	664.1
	31	8	1	952.56	.67	1	57 152.6	55	208 731.0	725.9
	32	8	2	983.29	.67	2	58 996.3	2 00	217 806	790
	33	8	3	1 014.02	.67	3	60 839.9	3 00	326 706	1 778
	34	8	4	1 044.74	.67	4	62 683.6	4 00	435 601	3 161
12	35	30.728	35	1 075.47	1843.67	35	64 527.2	5 00	544 490	4 940
	36	8	6	1 106.20	.68	6	66 370.9	6 00	653 372	7 113
	37	8	7	1 136.93	.68	7	68 214.6	7 00	762 246	9 682
	38	8	8	1 167.65	.68	8	70 058.3	8 00	871 110	12 646
	39	8	9	1 198.38	.68	9	71 902.0	9 00	979 962	16 004
12	40	30.728	40	1 229.11	1843.69	40	73 745.6	10 00	1 088 801	19 757
	41	8	1	1 259.84	.69	1	75 589.3	11 00	1 197 626	23 905
	42	8	2	1 290.56	.69	2	77 433.0	12 00	1 306 435	28 449
	43	8	3	1 321.29	.69	3	79 276.7	13 00	1 415 227	33 387
	44	8	4	1 352.02	.70	4	81 120.4	14 00	1 524 000	38 719
12	45	30.728	45	1 382.75	1843.70	45	82 964.1	15 00	1 632 753	44 447
	46	8	6	1 413.48	.70	6	84 807.8	16 00	1 741 485	50 569
	47	8	7	1 444.20	.70	7	86 651.5	17 00	1 850 194	57 085
	48	8	8	1 474.93	.70	8	88 495.2	18 00	1 958 879	63 997
	49	8	9	1 505.66	.71	9	90 338.9	19 00	2 067 537	71 303
12	50	30.728	50	1 536.39	1843.71	50	92 182.6	20 00	2 176 168	79 003
	51	9	1	1 567.11	.71	1	94 026.3	21 00	2 284 771	87 096
	52	9	2	1 597.84	.71	2	95 870.1	22 00	2 393 344	95 584
	53	9	3	1 628.57	.72	3	97 713.8	23 00	2 501 885	104 466
	54	9	4	1 659.30	.72	4	99 557.5	24 00	2 610 394	113 741
12	55	30.729	55	1 690.03	1843.72	55	101 401.2	25 00	2 718 867	123 410
	56	9	6	1 720.75	.72	6	103 244.9	26 00	2 827 305	133 473
	57	9	7	1 751.48	.73	7	105 088.7	27 00	2 935 706	143 930
	58	9	8	1 782.21	.73	8	106 932.4	28 00	3 044 068	154 780
	59	9	9	1 812.94	.73	9	108 776.1	29 00	3 152 390	166 023
12	60	30.729	60	1 843.66	1843.73	60	110 619.8	30 00	3 260 671	177 658

Latitude 13° to 14°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
13 00	30.135	60.27	90.41	120.54	150.68	180.81	210.95	241.08	271.22	1808.1	3616.2	5424.3	7232.4	9040.5
1	.133	.27	.40	.53	.67	.80	.94	.06	.20	8.0	6.0	3.9	1.9	39.9
2	.131	.26	.39	.52	.66	.79	.92	.05	.18	7.9	5.7	3.6	1.4	9.3
3	.129	.26	.39	.52	.65	.77	.91	.03	.16	7.7	5.5	3.2	1.0	8.7
4	.127	.25	.38	.51	.64	.76	.89	.02	.14	7.6	5.2	2.9	0.5	8.1
13 05	30.125	60.25	90.37	120.50	150.62	180.75	210.88	241.00	271.12	1807.5	3615.0	5422.5	7230.0	9037.5
6	.123	.25	.37	.49	.61	.74	.86	0.98	.11	7.4	4.8	2.1	29.5	6.9
7	.121	.24	.36	.48	.60	.73	.85	.97	.09	7.3	4.5	1.8	9.0	6.3
8	.119	.24	.36	.48	.59	.71	.83	.95	.07	7.1	4.3	1.4	8.6	5.6
9	.117	.23	.35	.47	.58	.70	.82	.94	.05	7.0	4.0	1.1	8.1	5.0
13 10	30.115	60.23	90.34	120.46	150.57	180.69	210.80	240.92	271.03	1806.9	3613.8	5420.7	7227.6	9034.4
11	.113	.23	.34	.45	.56	.68	.79	.90	1.01	6.8	3.5	20.3	7.1	3.8
12	.111	.22	.33	.44	.55	.67	.77	.89	0.99	6.7	3.3	19.9	6.6	3.2
13	.109	.22	.33	.44	.54	.65	.76	.87	.98	6.5	3.0	9.6	6.1	2.6
14	.107	.21	.32	.43	.53	.64	.74	.85	.96	6.4	2.8	9.2	5.6	2.0
13 15	30.105	60.21	90.31	120.42	150.52	180.63	210.73	240.84	270.94	1806.3	3612.5	5418.8	7225.1	9031.4
16	.103	.21	.31	.41	.51	.62	.72	.82	.92	6.2	2.3	8.4	4.6	0.8
17	.101	.20	.30	.40	.50	.61	.70	.80	.90	6.1	2.0	8.1	4.1	30.2
18	.098	.20	.29	.39	.49	.59	.69	.78	.89	5.9	1.8	7.7	3.6	29.5
19	.096	.19	.29	.38	.48	.58	.67	.77	.87	5.8	1.5	7.4	3.1	8.9
13 20	30.094	60.19	90.28	120.38	150.47	180.57	210.66	240.75	270.85	1805.7	3611.3	5417.0	7222.6	9028.3
21	.092	.19	.28	.37	.46	.56	.65	.73	.83	5.6	1.1	6.6	2.1	7.7
22	.090	.18	.27	.36	.45	.54	.63	.72	.81	5.4	0.8	6.2	1.6	7.1
23	.088	.18	.26	.35	.44	.53	.62	.70	.79	5.3	0.6	5.9	1.1	6.4
24	.086	.17	.26	.34	.43	.51	.60	.69	.77	5.1	0.3	5.5	0.6	5.8
13 25	30.084	60.17	90.25	120.33	150.42	180.50	210.59	240.67	270.76	1805.0	3610.1	5415.1	7220.1	9025.2
26	.082	.17	.25	.33	.41	.49	.58	.65	.74	4.9	09.8	4.7	19.6	4.6
27	.080	.16	.24	.32	.40	.48	.56	.64	.72	4.8	9.6	4.3	9.1	4.0
28	.078	.16	.23	.31	.39	.46	.55	.62	.70	4.6	9.3	4.0	8.7	3.3
29	.076	.15	.23	.30	.38	.45	.53	.61	.68	4.5	9.1	3.6	8.2	2.7
13 30	30.074	60.15	90.22	120.29	150.37	180.44	210.52	240.59	270.66	1804.4	3608.8	5413.2	7217.7	9022.1
31	.072	.15	.21	.28	.36	.43	.51	.57	.64	4.3	8.6	2.8	7.2	1.5
32	.069	.14	.21	.27	.35	.42	.49	.56	.62	4.2	8.3	2.5	6.7	0.8
33	.067	.14	.20	.27	.34	.40	.48	.54	.60	4.0	8.1	2.1	6.1	20.2
34	.065	.13	.20	.26	.33	.39	.46	.52	.58	3.9	7.8	1.8	5.6	19.5
13 35	30.063	60.13	90.19	120.25	150.31	180.38	210.45	240.51	270.57	1803.8	3607.6	5411.4	7215.1	9018.9
36	.061	.13	.19	.24	.30	.37	.43	.49	.55	3.7	7.3	1.0	4.6	8.3
37	.059	.12	.18	.23	.29	.36	.42	.47	.53	3.6	7.1	0.6	4.1	7.7
38	.057	.12	.17	.23	.28	.34	.40	.45	.51	3.4	6.8	10.3	3.6	7.0
39	.055	.11	.16	.22	.27	.33	.39	.44	.49	3.3	6.6	09.9	3.1	6.4
13 40	30.053	60.11	90.16	120.21	150.26	180.32	210.37	240.42	270.47	1803.2	3606.3	5409.5	7212.6	9015.8
41	.051	.11	.15	.20	.25	.31	.36	.40	.45	3.1	6.0	9.1	2.1	5.2
42	.048	.10	.15	.19	.24	.29	.34	.39	.43	2.9	5.8	8.7	1.6	4.5
43	.046	.10	.14	.18	.23	.28	.33	.37	.41	2.8	5.5	8.4	1.1	3.9
44	.044	.09	.13	.17	.22	.26	.31	.35	.39	2.6	5.3	8.0	0.6	3.2
13 45	30.042	60.09	90.13	120.16	150.21	180.25	210.30	240.33	270.38	1802.5	3605.0	5407.6	7210.1	9012.6
46	.040	.08	.12	.16	.20	.24	.28	.32	.36	2.4	4.8	7.2	09.6	2.0
47	.038	.08	.11	.15	.19	.23	.27	.30	.34	2.3	4.5	6.8	9.1	1.3
48	.036	.07	.11	.14	.18	.21	.25	.28	.32	2.1	4.3	6.4	8.6	0.7
49	.033	.07	.10	.13	.17	.20	.24	.27	.30	2.0	4.0	6.0	8.1	10.0
13 50	30.031	60.06	90.09	120.12	150.16	180.19	210.22	240.25	270.28	1801.9	3603.8	5405.6	7207.5	9009.4
51	.029	.06	.09	.11	.15	.18	.21	.23	.26	1.8	3.5	5.2	7.0	8.8
52	.027	.05	.08	.10	.14	.16	.19	.22	.24	1.6	3.3	4.8	6.5	8.1
53	.025	.05	.07	.10	.13	.15	.18	.20	.22	1.5	3.0	4.5	5.9	7.5
54	.023	.04	.07	.09	.12	.13	.16	.18	.20	1.3	2.8	4.1	5.4	6.8
13 55	30.021	60.04	90.06	120.08	150.10	180.12	210.15	240.16	270.19	1801.2	3602.5	5403.7	7204.9	9006.2
56	.019	.04	.06	.07	.09	.11	.13	.15	.17	1.1	2.2	3.3	4.4	5.6
57	.016	.03	.05	.06	.08	.10	.12	.13	.15	1.0	2.0	2.9	3.9	4.9
58	.014	.03	.04	.06	.07	.08	.10	.11	.13	0.8	1.7	2.6	3.4	4.3
59	.012	.02	.04	.05	.06	.07	.09	.10	.11	0.7	1.5	2.2	2.9	3.6
13 60	30.010	60.02	90.03	120.04	150.05	180.06	210.07	240.08	270.09	1800.6	3601.2	5401.8	7202.4	9003.0

Lat.		Latitude 13° to 14°—Meridional arcs.						Latitude 13°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 13° 30′		Value of 1′	Continuous sums of minutes from latitude 13° 00′		Longitude.	X	Y
°	′	Meters.	″	Meters.	Meters.	′	Meters.	° ′	Meters.	Meters.
13	00	30.729			1843.73					
	1	9	1	30.73	.73	1	1 843.7	0 1	1 808.1	0.1
	2	9	2	61.46	.74	2	3 687.5	2	3 616.2	0.2
	3	9	3	92.19	.74	3	5 531.2	3	5 424.3	0.5
	4	9	4	122.92	.74	4	7 375.0	4	7 232.4	0.9
13	05	30.729	5	153.65	1843.74	5	9 218.7	0 5	9 040.5	1.5
	6	9	6	184.38	.75	6	11 062.4	6	10 848.6	2.1
	7	9	7	215.11	.75	7	12 906.2	7	12 656.7	2.9
	8	9	8	245.84	.75	8	14 750.0	8	14 464.8	3.8
	9	9	9	276.57	.75	9	16 593.7	9	16 272.9	4.8
13	10	30.729	10	307.30	1843.76	10	18 437.5	0 10	18 081.0	5.9
	11	9	1	338.03	.76	1	20 281.2	15	27 121.5	13.3
	12	9	2	368.76	.76	2	22 125.0	20	36 162.0	23.7
	13	9	3	399.49	.76	3	23 968.8	25	45 202.5	37.0
	14	9	4	430.22	.77	4	25 812.5	30	54 243.0	53.2
13	15	30.729	15	460.95	1843.77	15	27 656.3	0 35	63 283.5	72.5
	16	30	6	491.68	.77	6	29 500.1	40	72 324.0	94.7
	17	0	7	522.41	.77	7	31 343.8	45	81 364.5	119.9
	18	0	8	553.14	.78	8	33 187.6	50	90 405.0	148.0
	19	0	9	583.87	.78	9	35 031.4	55	99 445.4	179.1
13	20	30.730	20	614.60	1843.78	20	36 875.2	1 00	108 485.9	213.0
	21	0	1	645.33	.78	1	38 719.0	05	117 526.3	249.9
	22	0	2	676.06	.79	2	40 562.7	10	126 566.7	289.8
	23	0	3	706.79	.79	3	42 406.5	15	135 607.1	332.7
	24	0	4	737.52	.79	4	44 250.3	20	144 647.5	378.6
13	25	30.730	25	768.25	1843.79	25	46 094.1	1 25	153 687.9	427.4
	26	0	6	798.98	.80	6	47 937.9	30	162 728.3	479.1
	27	0	7	829.71	.80	7	49 781.7	35	171 768.6	533.8
	28	0	8	860.44	.80	8	51 625.5	40	180 809.0	591.6
	29	0	9	891.17	.80	9	53 469.3	45	189 849.2	652.1
13	30	30.730	30	921.90	1843.81	30	55 313.1	1 50	198 889.5	715.7
	31	0	1	952.63	.81	1	57 156.9	55	207 929.6	782.3
	32	0	2	983.36	.81	2	59 000.8	2 00	216 970	852
	33	0	3	1 014.09	.81	3	60 844.6	3 00	325 451	1 917
	34	0	4	1 044.82	.82	4	62 688.4	4 00	433 927	3 407
13	35	30.730	35	1 075.55	1843.82	35	64 532.2	5 00	542 396	5 324
	36	0	6	1 106.28	.82	6	66 376.0	6 00	650 857	7 666
	37	0	7	1 137.01	.82	7	68 219.8	7 00	759 307	10 434
	38	0	8	1 167.74	.83	8	70 063.6	8 00	867 746	13 628
	39	0	9	1 198.47	.83	9	71 907.5	9 00	976 172	17 248
13	40	30.731	40	1 229.21	1843.83	40	73 751.3	10 00	1 084 583	21 294
	41	1	1	1 259.94	.83	1	75 595.1	11 00	1 192 977	25 765
	42	1	2	1 290.67	.84	2	77 439.0	12 00	1 301 352	30 661
	43	1	3	1 321.40	.84	3	79 282.8	13 00	1 409 708	35 983
	44	1	4	1 352.13	.84	4	81 126.7	14 00	1 518 042	41 730
13	45	30.731	45	1 382.86	1843.84	45	82 970.5	15 00	1 626 352	47 903
	46	1	6	1 413.59	.85	6	84 814.3	16 00	1 734 637	54 501
	47	1	7	1 444.32	.85	7	86 658.2	17 00	1 842 896	61 524
	48	1	8	1 475.05	.85	8	88 502.0	18 00	1 951 126	68 972
	49	1	9	1 505.78	.85	9	90 345.9	19 00	2 059 326	76 845
13	50	30.731	50	1 536.51	1843.86	50	92 189.8	20 00	2 167 494	85 143
	51	1	1	1 567.24	.86	1	94 033.6	21 00	2 275 629	93 865
	52	1	2	1 597.97	.86	2	95 877.5	22 00	2 383 729	103 012
	53	1	3	1 628.70	.86	3	97 721.3	23 00	2 491 792	112 583
	54	1	4	1 659.43	.87	4	99 565.2	24 00	2 599 817	122 578
13	55	30.731	55	1 690.16	1843.87	55	101 409.1	25 00	2 707 801	132 997
	56	1	6	1 720.89	.87	6	103 252.9	26 00	2 815 744	143 840
	57	1	7	1 751.62	.87	7	105 096.8	27 00	2 923 644	155 107
	58	1	8	1 782.35	.88	8	106 940.7	28 00	3 031 498	166 798
	59	1	9	1 813.08	.88	9	108 784.6	29 00	3 139 305	178 912
13	60	30.731	60	1 843.81	1843.88	60	110 628.4	30 00	3 247 065	191 448

Latitude 14° to 15°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
14 00	30.010	60.02	90.03	120.04	150.05	180.06	210.07	240.08	270.09	1800.6	3601.2	5401.8	7202.4	9003.0
1	.008	.02	.02	.03	.04	.05	.06	.06	.07	0.5	0.9	1.4	1.9	2.3
2	.005	.01	.02	.02	.03	.03	.04	.04	.05	0.3	0.7	1.0	1.3	1.6
3	.003	.01	.01	.01	.02	.02	.03	.03	.03	0.2	0.4	0.6	0.8	1.0
4	.001	.00	90.00	20.00	50.01	80.01	.01	40.01	70.01	800.1	600.2	400.2	200.2	9000.4
14 05	29.999	60.00	90.00	119.99	149.99	179.99	210.00	239.99	269.99	1799.9	3599.9	5399.8	7199.7	8999.7
6	.997	60.00	89.99	.99	.98	.98	09.98	.97	.97	9.8	9.6	9.4	9.2	9.0
7	.995	59.99	.98	.98	.97	.97	.97	.95	.95	9.7	9.4	9.0	8.7	8.4
8	.992	.99	.98	.97	.96	.95	.95	.94	.93	9.5	9.1	8.7	8.1	7.7
9	.990	.98	.97	.96	.95	.94	.94	.92	.91	9.4	8.9	8.3	7.6	7.1
14 10	29.988	59.98	89.96	119.95	149.94	179.93	209.92	239.90	269.89	1799.3	3598.6	5397.9	7197.1	8996.4
11	.986	.98	.96	.94	.93	.92	.90	.88	.87	9.2	8.3	7.5	6.6	5.7
12	.984	.97	.95	.93	.92	.90	.89	.87	.85	9.0	8.0	7.1	6.1	5.1
13	.981	.97	.94	.92	.91	.89	.87	.85	.83	8.9	7.8	6.7	5.5	4.4
14	.979	.96	.94	.91	.90	.88	.86	.83	.81	8.8	7.5	6.3	5.0	3.8
14 15	29.977	59.96	89.93	119.90	149.88	179.86	209.84	239.81	269.79	1798.6	3597.2	5395.9	7194.5	8993.1
16	.975	.95	.92	.90	.87	.85	.82	.80	.77	8.5	6.9	5.5	4.0	2.4
17	.973	.95	.92	.89	.86	.84	.81	.78	.75	8.4	6.7	5.1	3.5	1.8
18	.970	.94	.91	.88	.85	.82	.79	.76	.73	8.2	6.4	4.7	2.9	1.1
19	.968	.94	.91	.87	.84	.81	.78	.75	.71	8.1	6.2	4.3	2.4	90.5
14 20	29.966	59.93	89.90	119.86	149.83	179.80	209.76	239.73	269.69	1798.0	3595.9	5393.9	7191.9	8989.8
21	.964	.93	.89	.85	.82	.79	.75	.71	.67	7.9	5.6	3.5	1.4	9.1
22	.962	.92	.89	.84	.81	.77	.73	.69	.65	7.7	5.4	3.1	0.8	8.5
23	.959	.92	.88	.84	.80	.76	.72	.68	.63	7.6	5.1	2.7	90.3	7.8
24	.957	.91	.87	.83	.79	.74	.70	.66	.61	7.4	4.9	2.3	89.7	7.2
14 25	29.955	59.91	89.86	119.82	149.77	179.73	209.69	239.64	269.59	1797.3	3594.6	5391.9	7189.2	8986.5
26	.953	.91	.86	.81	.76	.72	.67	.62	.57	7.2	4.3	1.5	8.7	5.8
27	.950	.90	.85	.80	.75	.70	.66	.60	.55	7.0	4.1	1.1	8.1	5.1
28	.948	.90	.84	.80	.74	.69	.64	.59	.53	6.9	3.8	0.7	7.6	4.5
29	.946	.89	.84	.79	.73	.67	.63	.57	.51	6.7	3.6	90.3	7.0	3.8
14 30	29.944	59.89	89.83	119.78	149.72	179.66	209.61	239.55	269.49	1796.6	3593.3	5389.9	7186.5	8983.1
31	.941	.89	.82	.77	.71	.65	.59	.53	.47	6.5	3.0	9.5	6.0	2.4
32	.939	.88	.82	.76	.70	.64	.58	.51	.45	6.4	2.7	9.1	5.4	1.8
33	.937	.88	.81	.75	.69	.62	.56	.50	.43	6.2	2.5	8.7	4.9	1.1
34	.935	.87	.80	.74	.68	.61	.55	.48	.41	6.1	2.2	8.3	4.3	80.5
14 35	29.933	59.87	89.80	119.73	149.66	179.60	209.53	239.46	269.39	1796.0	3591.9	5387.9	7183.8	8979.8
36	.930	.86	.79	.73	.65	.58	.51	.44	.37	5.8	1.6	7.5	3.3	9.1
37	.928	.86	.78	.72	.64	.57	.50	.42	.35	5.7	1.4	7.1	2.7	8.4
38	.926	.85	.78	.71	.63	.56	.48	.41	.33	5.6	1.1	6.6	2.2	7.8
39	.924	.85	.77	.70	.62	.54	.47	.39	.31	5.4	0.9	6.2	1.6	7.1
14 40	29.921	59.84	89.76	119.69	149.61	179.53	209.45	239.37	269.29	1795.3	3590.6	5385.8	7181.1	8976.4
41	.919	.84	.76	.68	.60	.52	.43	.35	.27	5.2	0.3	5.4	0.6	5.7
42	.917	.83	.75	.67	.59	.50	.42	.33	.25	5.0	90.0	5.0	80.0	5.0
43	.915	.83	.74	.66	.57	.49	.40	.32	.23	4.9	89.8	4.5	79.5	4.4
44	.912	.82	.74	.65	.56	.47	.39	.30	.21	4.7	9.5	4.1	8.9	3.7
14 45	29.910	59.82	89.73	119.64	149.55	179.46	209.37	239.28	269.19	1794.6	3589.2	5383.7	7178.4	8973.0
46	.908	.82	.72	.63	.54	.45	.35	.26	.17	4.5	8.9	3.3	7.9	2.3
47	.905	.81	.72	.62	.53	.43	.34	.24	.15	4.3	8.6	2.9	7.3	1.6
48	.903	.81	.71	.61	.51	.42	.32	.23	.13	4.2	8.4	2.5	6.8	1.0
49	.901	.80	.70	.60	.50	.40	.31	.21	.11	4.0	8.1	2.1	6.2	70.3
14 50	29.899	59.80	89.70	119.59	149.49	179.39	209.29	239.19	269.09	1793.9	3587.8	5381.7	7175.7	8969.6
51	.896	.80	.69	.58	.48	.38	.27	.17	.07	3.8	7.5	1.3	5.1	8.9
52	.894	.79	.68	.57	.47	.36	.26	.15	.05	3.6	7.2	0.9	4.6	8.2
53	.892	.79	.68	.56	.46	.35	.24	.13	.03	3.5	7.0	0.5	4.0	7.5
54	.889	.78	.67	.55	.45	.33	.23	.11	9.01	3.3	6.7	80.1	3.5	6.8
14 55	29.887	59.78	89.66	119.54	149.43	179.32	209.21	239.09	268.98	1793.2	3586.4	5379.7	7172.9	8966.1
56	.885	.77	.65	.54	.42	.31	.19	.08	.96	3.1	6.1	9.3	2.3	5.4
57	.882	.77	.65	.53	.41	.29	.18	.06	.94	2.9	5.9	8.9	1.8	4.7
58	.880	.76	.64	.52	.40	.28	.16	.04	.92	2.8	5.6	8.4	1.2	4.1
59	.878	.76	.63	.51	.39	.26	.15	.02	.90	2.6	5.4	8.0	0.7	3.4
14 60	29.876	59.75	89.63	119.50	149.38	179.25	209.13	239.00	268.88	1792.5	3585.1	5377.6	7170.1	8962.7

Lat.		Latitude 14° to 15°—Meridional arcs.						Latitude 14°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 14° 30′		Value of 1′	Continuous sums of minutes from latitude 14° 00′		Longitude.	X	Y
°	′	Meters.	″	Meters.	Meters.	′	Meters.	° ′	Meters.	Meters.
14	00	30.731			1843.88					
	1	1	1	30.73	.88	1	1 843.9	0 1	1 800.6	0.1
	2	1	2	61.47	.89	2	3 687.8	2	3 601.2	0.3
	3	1	3	92.20	.89	3	5 531.7	3	5 401.8	0.6
	4	2	4	122.93	.89	4	7 375.6	4	7 202.4	1.0
14	05	30.732	5	153.66	1843.89	5	9 219.4	0 5	9 002.9	1.6
	6	2	6	184.40	.90	6	11 063.3	6	10 803.5	2.3
	7	2	7	215.13	.90	7	12 907.2	7	12 604.1	3.1
	8	2	8	245.86	.90	8	14 751.1	8	14 404.7	4.1
	9	2	9	276.59	.91	9	16 595.0	9	16 205.3	5.1
14	10	30.732	10	307.33	1843.91	10	18 438.9	0 10	18 005.9	6.3
	11	2	1	338.06	.91	1	20 282.9	15	27 008.8	14.2
	12	2	2	368.79	.91	2	22 126.8	20	36 011.8	25.3
	13	2	3	399.52	.92	3	23 970.7	25	45 014.7	39.6
	14	2	4	430.26	.92	4	25 814.6	30	54 017.7	57.0
14	15	30.732	15	460.99	1843.92	15	27 658.5	0 35	63 020.6	77.6
	16	2	6	491.72	.92	6	29 502.5	40	72 023.5	101.4
	17	2	7	522.46	.93	7	31 346.4	45	81 026.4	128.3
	18	2	8	553.19	.93	8	33 190.3	50	90 029.3	158.4
	19	2	9	583.92	.93	9	35 034.3	55	99 032.2	191.7
14	20	30.732	20	614.65	1843.93	20	36 878.2	1 00	108 035.1	228.1
	21	2	1	645.39	.94	1	38 722.1	05	117 037.9	267.7
	22	2	2	676.12	.94	2	40 566.1	10	126 040.8	310.4
	23	2	3	706.85	.94	3	42 410.0	15	135 043.6	356.4
	24	2	4	737.58	.94	4	44 254.0	20	144 046.4	405.5
14	25	30.732	25	768.32	1843.95	25	46 097.9	1 25	153 049.2	457.7
	26	2	6	799.05	.95	6	47 941.9	30	162 052.0	513.2
	27	3	7	829.78	.95	7	49 785.8	35	171 054.8	571.8
	28	3	8	860.52	.96	8	51 629.8	40	180 057.5	633.6
	29	3	9	891.25	.96	9	53 473.7	45	189 060.2	698.5
14	30	30.733	30	921.98	1843.96	30	55 317.7	1 50	198 062.9	766.6
	31	3	1	952.71	.96	1	57 161.6	55	207 065.6	837.9
	32	3	2	983.45	.97	2	59 005.6	2 00	216 068	912
	33	3	3	1 014.18	.97	3	60 849.5	3 00	324 098	2 053
	34	3	4	1 044.91	.97	4	62 693.5	4 00	432 121	3 649
14	35	30.733	35	1 075.64	1843.97	35	64 537.5	5 00	540 137	5 702
	36	3	6	1 106.38	.98	6	66 381.5	6 00	648 143	8 210
	37	3	7	1 137.11	.98	7	68 225.4	7 00	756 138	11 175
	38	3	8	1 167.84	.98	8	70 069.4	8 00	864 119	14 595
	39	3	9	1 198.57	.98	9	71 913.4	9 00	972 085	18 472
14	40	30.733	40	1 229.31	1843.99	40	73 757.4	10 00	1 080 033	22 805
	41	3	1	1 260.04	.99	1	75 601.4	11 00	1 187 962	27 593
	42	3	2	1 290.77	.99	2	77 445.4	12 00	1 295 870	32 887
	43	3	3	1 321.51	3.99	3	79 289.4	13 00	1 403 755	38 536
	44	3	4	1 352.24	4.00	4	81 133.4	14 00	1 511 615	44 691
14	45	30.733	45	1 382.97	1844.00	45	82 977.3	15 00	1 619 448	51 301
	46	3	6	1 413.70	.00	6	84 821.4	16 00	1 727 252	58 366
	47	3	7	1 444.44	.00	7	86 665.4	17 00	1 835 025	65 887
	48	3	8	1 475.17	.01	8	88 509.4	18 00	1 942 766	73 863
	49	3	9	1 505.90	.01	9	90 353.4	19 00	2 050 472	82 294
14	50	30.734	50	1 536.63	1844.01	50	92 197.4	20 00	2 158 142	91 179
	51	4	1	1 567.37	.01	1	94 041.4	21 00	2 265 772	100 518
	52	4	2	1 598.10	.02	2	95 885.4	22 00	2 373 362	110 312
	53	4	3	1 628.83	.02	3	97 729.4	23 00	2 480 911	120 560
	54	4	4	1 659.57	.02	4	99 573.5	24 00	2 588 415	131 262
14	55	30.734	55	1 690.30	1844.02	55	101 417.5	25 00	2 695 873	142 418
	56	4	6	1 721.03	.03	6	103 261.5	26 00	2 803 283	154 028
	57	4	7	1 751.76	.03	7	105 105.5	27 00	2 910 642	166 091
	58	4	8	1 782.50	.03	8	106 949.6	28 00	3 017 950	178 607
	59	4	9	1 813.23	.04	9	108 793.6	29 00	3 125 204	191 576
14	60	30.734	60	1 843.96	1844.04	60	110 637.6	30 00	3 232 402	204 998

Latitude 15° to 16°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
15 00	29.876	59.75	89.63	119.50	149.38	179.25	209.13	239.00	268.88	1792.5	3585.1	5377.6	7170.1	8962.7
1	.873	.75	.62	.49	.37	.24	.11	8.98	.86	2.4	4.8	7.2	69.6	2.0
2	.871	.74	.61	.48	.36	.22	.10	.96	.84	2.2	4.5	6.8	9.0	1.3
3	.869	.74	.61	.47	.34	.21	.08	.95	.82	2.1	4.3	6.3	8.4	60.6
4	.866	.73	.60	.46	.33	.19	.07	.93	.80	1.9	4.0	5.9	7.9	59.9
15 05	29.864	59.73	89.59	119.45	149.32	179 18	209.05	238.91	268.77	1791.8	3583.7	5375.5	7167.3	8959.2
6	.862	.72	.59	.45	.31	.17	.03	.89	.75	1.7	3.4	5.1	6.8	8.5
7	.859	.72	.58	.44	.30	.15	.02	.87	.73	1.5	3.1	4.7	6.2	7.8
8	.857	.71	.57	.43	.28	.14	9.00	.86	.71	1.4	2.9	4.2	5.7	7.1
9	.855	.71	.56	.42	.27	.12	8.99	.84	.69	1.2	2.6	3.8	5.1	6.4
15 10	29.852	59.70	89.56	119.41	149.26	179.11	208.97	238.82	268.67	1791.1	3582.3	5373.4	7164.6	8955.7
11	.850	.70	.55	.40	.25	.10	.95	.80	.65	1.0	2.0	3.0	4.0	5.0
12	.848	.69	.54	.39	.24	.08	.94	.78	.63	0.8	1.7	2.6	3.4	4.3
13	.845	.69	.54	.38	.22	.07	.92	.76	.61	0.7	1.5	2.1	2.9	3.6
14	.843	.68	.53	.37	.21	.05	.90	.74	.59	0.5	1.2	1.7	2.3	2.9
15 15	29.841	59.68	89.52	119.36	149.20	179.04	208.89	238.72	268.56	1790.4	3580.9	5371.3	7161.7	8952.2
16	.838	.68	.52	.35	19	.03	.87	.71	.54	0.3	0.6	0.9	1.1	1.5
17	.836	.67	.51	.34	.18	.01	.85	.69	.52	0.1	0.3	0.5	0.6	0.8
18	.833	.67	.50	.33	.16	9.00	.83	.67	.50	90.0	80.0	70.0	60.0	50.0
19	.831	.66	.49	.32	.15	8.98	.82	.65	.48	89.8	79.7	69.6	59.5	49.3
15 20	29.829	59.66	89.49	119.31	149.14	178.97	208.80	238.63	268.46	1789.7	3579.4	5369.2	7158.9	8948.6
21	.826	.66	.48	.30	.13	.96	.78	.61	.44	9.6	9.1	8.8	8.3	7.9
22	.824	.65	.47	.29	.12	.94	.77	.59	.42	9.4	8.8	8.3	7.7	7.2
23	.821	.65	.46	.28	.11	.93	.75	.57	.40	9.3	8.6	7.9	7.2	6.4
24	.819	.64	.46	.27	.10	.91	.74	.55	.38	9.1	8.3	7.4	6.6	5.7
15 25	29.817	59.64	89.45	119.26	149.08	178.90	208.72	238.54	268.35	1789.0	3578.0	5367.0	7156.0	8945.0
26	.814	.63	.44	.26	.07	.89	.70	.52	.33	8.9	7.7	6.6	5.4	4.3
27	.812	.63	.44	.25	.06	.87	.69	.50	.31	8.7	7.4	6.2	4.9	3.6
28	.810	.62	.43	.24	.05	.86	.67	.48	.29	8.6	7.2	5.7	4.3	2.9
29	.807	.62	.42	.23	.04	.84	.66	.46	.27	8.4	6.9	5.3	3.8	2.2
15 30	29.805	59.61	89.42	119.22	149.03	178.83	208.64	238.44	268.25	1788.3	3576.6	5364.9	7153.2	8941.5
31	.803	.61	.41	.21	.02	.82	.62	.42	.23	8.2	6.3	4.5	2.6	0.8
32	.800	.60	.40	.20	9.01	.80	.61	.40	.21	8.0	6.0	4.0	2.0	40.1
33	.798	.60	.39	.19	8.99	.79	.59	.38	.18	7.9	5.8	3.6	1.5	39.3
34	.795	.59	.39	.18	.98	.77	.57	.36	.16	7.7	5.5	3.1	0.9	8.6
15 35	29.793	59.59	89.38	119.17	148.97	178.76	208.55	238.35	268.14	1787.6	3575.2	5362.7	7150.3	8937.9
36	.791	.58	.37	.16	.96	.75	.54	.33	.12	7.5	4.9	2.3	49.7	7.2
37	.788	.58	.36	.15	.95	.73	.52	.31	.10	7.3	4.6	1.9	9.1	6.5
38	.786	.57	.36	.14	.93	.72	.50	.29	.07	7.2	4.3	1.4	8.6	5.7
39	.783	.57	.35	.13	.92	.70	.49	.27	.05	7.0	4.0	1.0	8.0	5.0
15 40	29.781	59.56	89.34	119.12	148.91	178.69	208.47	238.25	268.03	1786.9	3573.7	5360.6	7147.4	8934.3
41	.779	.56	.34	.11	.90	.67	.45	.23	8.01	6.7	3.4	60.2	6.8	3.6
42	.776	.55	.33	.10	.88	.66	.44	.21	7.99	6.6	3.1	59.7	6.2	2.8
43	.774	.55	.32	.09	.87	.64	.42	.19	.96	6.4	2.9	9.3	5.7	2.1
44	.771	.54	.31	.08	.86	.63	.40	.17	.94	6.3	2.6	8.8	5.1	1.3
15 45	29.769	59.54	89.31	119.07	148.84	178.61	208.39	238.15	267.92	1786.1	3572.3	5358.4	7144.5	8930.6
46	.766	.53	.30	.07	.83	.60	.37	.13	.90	6.0	2.0	8.0	3.9	29.9
47	.764	.53	.29	.06	.82	.58	.35	.11	.88	5.8	1.7	7.5	3.3	9.2
48	.761	.52	.28	.05	.81	.57	.33	.09	.85	5.7	1.4	7.1	2.8	8.4
49	.759	.52	.28	.04	.79	.55	.32	.07	.83	5.5	1.1	6.6	2.2	7.7
15 50	29.757	59.51	89.27	119.03	148.78	178.54	208.30	238.05	267.81	1785.4	3570.8	5356.2	7141.6	8927.0
51	.754	.51	.26	.02	.77	.53	.28	.03	.79	5.3	0.5	5.8	1.0	6.3
52	.752	.50	.26	.01	.76	.51	.27	8.01	.77	5.1	70.2	5.3	40.4	5.5
53	.749	.50	.25	9.00	.74	.50	.25	7.99	.74	5.0	69.9	4.9	39.9	4.8
54	.747	.49	.24	8.99	.73	.48	.23	.97	.72	4.8	9.6	4.4	9.3	4.0
15 55	29.744	59.49	89.23	118.98	148.72	178.47	208.22	237.96	267.70	1784.7	3569.3	5354.0	7138.7	8923.3
56	.742	.48	.23	.97	.71	.45	.20	.94	.68	4.5	9.0	3.6	8.1	2.6
57	.740	.48	.22	.96	.70	.44	.18	.92	.66	4.4	8.7	3.1	7.5	1.9
58	.737	.47	.21	.95	.68	.42	.16	.90	.63	4.2	8.5	2.7	6.9	1.1
59	.735	.47	.20	.94	.67	.41	.15	.88	.61	4.1	8.2	2.2	6.3	20.4
15 60	29.732	59.46	89.20	118.93	148.66	178.39	208.13	237.86	267.59	1783.9	3567.9	5351.8	7135.7	8919.7

Lat.		Latitude 15° to 16°—Meridional arcs.						Latitude 15°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 15° 30′		Value of 1′	Continuous sums of minutes from latitude 15° 00′		Longitude.	X	Y
°	′	Meters.	″	Meters.	Meters.	′	Meters.	° ′	Meters.	Meters.
15	00	30.734			1844.04					
	1	4	1	30.74	.04	1	1 844.0	0 1	1 792.5	0.1
	2	4	2	61.47	.05	2	3 688.1	2	3 585.1	0.3
	3	4	3	92.21	.05	3	5 532.1	3	5 377.6	0.6
	4	4	4	122.94	.05	4	7 376.2	4	7 170.1	1.1
15	05	30.734	5	153.68	1844.05	5	9 220.2	0 5	8 962.7	1.7
	6	4	6	184.41	.06	6	11 064.3	6	10 755.2	2.4
	7	4	7	215.15	.06	7	12 908.4	7	12 547.7	3.3
	8	4	8	245.88	.06	8	14 752.4	8	14 340.2	4.3
	9	4	9	276.62	.06	9	16 596.5	9	16 132.8	5.5
15	10	30.734	10	307.35	1844.07	10	18 440.6	0 10	17 925.3	6.8
	11	5	1	338.09	.07	1	20 284.6	15	26 887.9	15.2
	12	5	2	368.82	.07	2	22 128.7	20	35 850.6	27.0
	13	5	3	399.56	.08	3	23 972.8	25	44 813.2	42.2
	14	5	4	430.30	.08	4	25 816.9	30	53 775.9	60.7
15	15	30.735	15	461.03	1844.08	15	27 660.9	0 35	62 738.5	82.7
	16	5	6	491.77	.08	6	29 505.0	40	71 701.2	108.0
	17	5	7	522.50	.09	7	31 349.1	45	80 663.8	136.7
	18	5	8	553.24	.09	8	33 193.2	50	89 626.4	168.7
	19	5	9	583.97	.09	9	35 037.3	55	98 589.0	204.1
15	20	30.735	20	614.71	1844.10	20	36 881.4	1 00	107 551.6	242.9
	21	5	1	645.44	.10	1	38 725.5	05	116 514.1	285.1
	22	5	2	676.18	.10	2	40 569.6	10	125 476.6	330.7
	23	5	3	706.91	.10	3	42 413.7	15	134 439.2	379.6
	24	5	4	737.65	.11	4	44 257.8	20	143 401.7	431.9
15	25	30.735	25	768.39	1844.11	25	46 101.9	1 25	152 364.2	487.5
	26	5	6	799.12	.11	6	47 946.0	30	161 326.6	546.6
	27	5	7	829.86	.12	7	49 790.1	35	170 289.1	609.0
	28	5	8	860.59	.12	8	51 634.3	40	179 251.5	674.8
	29	5	9	891.33	.12	9	53 478.4	45	188 213.9	743.9
15	30	30.735	30	922.06	1844.12	30	55 322.5	1 50	197 176.3	816.5
	31	5	1	952.80	.13	1	57 166.6	55	206 138.6	892.4
	32	5	2	983.53	.13	2	59 010.8	2 00	215 101	972
	33	6	3	1 014.27	.13	3	60 854.9	3 00	322 646	2 186
	34	6	4	1 045.00	.13	4	62 699.0	4 00	430 184	3 887
15	35	30.736	35	1 075.74	1844.14	35	64 543.2	5 00	537 713	6 072
	36	6	6	1 106.47	.14	6	66 387.3	6 00	645 232	8 744
	37	6	7	1 137.21	.14	7	68 231.4	7 00	752 738	11 901
	38	6	8	1 167.95	.15	8	70 075.6	8 00	860 228	15 545
	39	6	9	1 198.68	.15	9	71 919.7	9 00	967 701	19 674
15	40	30.736	40	1 229.42	1844.15	40	73 763.9	10 00	1 075 153	24 288
	41	6	1	1 260.15	.15	1	75 608.0	11 00	1 182 584	29 387
	42	6	2	1 290.89	.16	2	77 452.2	12 00	1 289 991	34 972
	43	6	3	1 321.62	.16	3	79 296.3	13 00	1 397 371	41 042
	44	6	4	1 352.36	.16	4	81 140.5	14 00	1 504 723	47 597
15	45	30.736	45	1 383.09	1844.17	45	82 984.6	15 00	1 612 046	54 636
	46	6	6	1 413.83	.17	6	84 828.8	16 00	1 719 333	62 160
	47	6	7	1 444.56	.17	7	86 673.0	17 00	1 826 586	70 169
	48	6	8	1 475.30	.17	8	88 517.2	18 00	1 933 802	78 662
	49	6	9	1 506.03	.18	9	90 361.3	19 00	2 040 978	87 639
15	50	30.736	50	1 536.77	1844.18	50	92 205.5	20 00	2 148 113	97 101
	51	6	1	1 567.51	.18	1	94 049.7	21 00	2 255 204	107 047
	52	6	2	1 598.24	.19	2	95 893.9	22 00	2 362 248	117 476
	53	6	3	1 628.98	.19	3	97 738.1	23 00	2 469 245	128 388
	54	7	4	1 659.71	.19	4	99 582.3	24 00	2 576 192	139 784
15	55	30.737	55	1 690.45	1844.19	55	101 426.5	25 00	2 683 086	151 663
	56	7	6	1 721.18	.20	6	103 270.6	26 00	2 789 925	164 024
	57	7	7	1 751.92	.20	7	105 114.8	27 00	2 896 708	176 868
	58	7	8	1 782.65	.20	8	106 959.0	28 00	3 003 430	190 194
	59	7	9	1 813.39	.20	9	108 803.3	29 00	3 110 091	204 003
15	60	30.737	60	1 844.12	1844.21	60	110 647.5	30 00	3 216 690	218 294

Latitude 16° to 17°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
16 00	29.732	59.46	89.20	118.93	148.66	178.39	208.13	237.86	267.59	1783.9	3567.9	5351.8	7135.7	8919.7
1	.730	.46	.19	.92	.65	.38	.11	.84	.57	3.8	7.6	1.4	5.1	8.9
2	.727	.45	.18	.91	.64	.36	.09	.82	.55	3.6	7.3	0.9	4.5	8.2
3	.725	.45	.17	.90	.62	.35	.08	.80	.53	3.5	7.0	0.5	3.9	7.4
4	.722	.44	.17	.89	.61	.33	.06	.78	.51	3.3	6.7	50.0	3.3	6.7
16 05	29.720	59.44	89.16	118.88	148.60	178.32	208.04	237.76	267.48	1783.2	3566.4	5349.6	7132.7	8915.9
6	.717	.43	.15	.87	.59	.30	.02	.74	.46	3.0	6.1	9.1	2.1	5.2
7	.715	.43	.14	.86	.58	.29	8.00	.72	.44	2.9	5.8	8.7	1.5	4.4
8	.712	.42	.14	.85	.56	.27	7.99	.70	.41	2.7	5.5	8.2	1.0	3.7
9	.710	.42	.13	.84	.55	.26	.97	.68	.39	2.6	5.2	7.8	30.4	2.9
16 10	29.707	59.41	89.12	118.83	148.54	178.24	207.95	237.66	267.37	1782.4	3564.9	5347.3	7129.8	8912.2
11	.705	.41	.11	.82	.53	.23	.93	.64	.35	2.3	4.6	6.9	9.2	1.5
12	.702	.40	.11	.81	.51	.21	.92	.62	.32	2.1	4.3	6.4	8.6	0.7
13	.700	.40	.10	.80	.50	.20	.90	.60	.30	2.0	4.0	6.0	8.0	10.0
14	.697	.39	.09	.79	.49	.18	.88	.58	.28	1.8	3.7	5.5	7.4	09.2
16 15	29.695	59.39	89.08	118.78	148.47	178.17	207.87	237.56	267.26	1781.7	3563.4	5345.1	7126.8	8908.5
16	.692	.38	.08	.77	.46	.15	.85	.54	.23	1.5	3.1	4.6	6.2	7.7
17	.690	.38	.07	.76	.45	.14	.83	.52	.21	1.4	2.8	4.2	5.6	7.0
18	.687	.37	.06	.75	.44	.12	.81	.50	.19	1.2	2.5	3.7	5.0	6.2
19	.685	.37	.06	.74	.42	.11	.80	.48	.16	1.1	2.2	3.3	4.4	5.5
16 20	29.682	59.36	89.05	118.73	148.41	178.09	207.78	237.46	267.14	1780.9	3561.9	5342.8	7123.8	8904.7
21	.680	.36	.04	.72	.40	.08	.76	.44	.12	0.8	1.6	2.4	3.2	3.9
22	.677	.35	.03	.71	.39	.06	.74	.42	.09	0.6	1.3	1.9	2.6	3.1
23	.675	.35	.02	.70	.37	.05	.73	.40	.07	0.5	1.0	1.5	1.9	2.4
24	.672	.34	.02	.69	.36	.03	.71	.38	.05	0.3	0.7	1.0	1.3	1.6
16 25	29.669	59.34	89.01	118.68	148.35	178.02	207.69	237.36	267.02	1780.2	3560.4	5340.6	7120.7	8900.8
26	.667	.33	9.00	.67	.34	8.00	.67	.34	7.00	80.0	60.1	40.1	20.1	900.0
27	.664	.33	8.99	.66	.33	7.99	.65	.32	6.98	79.9	59.8	39.7	19.5	899.3
28	.662	.32	.99	.65	.31	.97	.64	.30	.96	9.7	9.5	9.2	8.9	8.6
29	.660	.32	.98	.64	.30	.96	.62	.28	.93	9.6	9.2	8.8	8.3	7.9
16 30	29.657	59.31	88.97	118.63	148.29	177.94	207.60	237.26	266.91	1779.4	3558.9	5338.3	7117.7	8897.1
31	.654	.31	.96	.62	.28	.93	.58	.24	.89	9.3	8.6	7.8	7.1	6.3
32	.652	.30	.96	.61	.26	.91	.56	.22	.86	9.1	8.3	7.4	6.5	5.6
33	.649	.30	.95	.60	.25	.90	.55	.20	.84	9.0	7.9	6.9	5.8	4.8
34	.647	.29	.94	.59	.24	.88	.53	.18	.82	8.8	7.6	6.5	5.2	4.1
16 35	29.644	59.29	88.93	118.58	148.22	177.87	207.51	237.15	266.79	1778.7	3557.3	5336.0	7114.6	8893.3
36	.642	.28	.92	.57	.21	.85	.49	.13	.77	8.5	7.0	5.5	4.0	2.5
37	.639	.28	.92	.56	.20	.84	.47	.11	.75	8.4	6.7	5.1	3.4	1.8
38	.637	.27	.91	.55	.19	.82	.46	.09	.73	8.2	6.4	4.6	2.8	1.0
39	.634	.27	.90	.54	.17	.81	.44	.07	.70	8.1	6.1	4.2	2.2	90.3
16 40	29.632	59.26	88.89	118.53	148.16	177.79	207.42	237.05	266.68	1777.9	3555.8	5333.7	7111.6	8889.5
41	.629	.26	.89	.52	.15	.77	.40	.03	.66	7.7	5.5	3.2	1.0	8.7
42	.626	.25	.88	.51	.13	.76	.38	7.01	.63	7.6	5.2	2.8	10.4	7.9
43	.624	.25	.87	.50	.12	.74	.37	6.99	.61	7.4	4.8	2.3	09.7	7.2
44	.621	.24	.86	.49	.11	.73	.35	.97	.59	7.3	4.5	1.9	9.1	6.4
16 45	29.619	59.24	88.86	118.47	148.09	177.71	207.33	236.95	266.56	1777.1	3554.2	5331.4	7108.5	8885.6
46	.616	.23	.85	.46	.08	.70	.31	.93	.54	7.0	3.9	0.9	7.9	4.8
47	.614	.23	.84	.45	.07	.68	.29	.91	.52	6.8	3.6	0.5	7.3	4.1
48	.611	.22	.83	.44	.06	.67	.28	.89	.50	6.7	3.3	30.0	6.6	3.3
49	.609	.22	.83	.43	.04	.65	.26	.87	.47	6.5	3.0	29.6	6.0	2.6
16 50	29.606	59.21	88.82	118.42	148.03	177.64	207.24	236.85	266.45	1776.4	3552.7	5329.1	7105.4	8881.8
51	.603	.21	.81	.41	.02	.62	.22	.83	.43	6.2	2.4	8.6	4.8	1.0
52	.601	.20	.80	.40	8.00	.61	.20	.81	.40	6.1	2.1	8.1	4.2	80.2
53	.598	.20	.79	.39	7.99	.59	.19	.79	.38	5.9	1.7	7.7	3.5	79.4
54	.595	.19	.79	.38	.98	.58	.17	.77	.36	5.8	1.4	7.2	2.9	8.6
16 55	29.593	59.19	88.78	118.37	147.96	177.56	207.15	236.74	266.33	1775.6	3551.1	5326.7	7102.3	8877.8
56	.590	.18	.77	.36	.95	.54	.13	.72	.31	5.4	0.8	6.2	1.7	7.0
57	.587	.18	.76	.35	.94	.53	.11	.70	.29	5.3	0.5	5.8	1.1	6.2
58	.585	.17	.76	.34	.93	.51	.10	.68	.27	5.1	50.2	5.3	100.4	5.5
59	.582	.17	.75	.33	.91	.50	.08	.66	.24	5.0	49.9	4.9	099.8	4.7
16 60	29.580	59.16	88.74	118.32	147.90	177.48	207.06	236.64	266.22	1774.8	3549.6	5324.4	7099.2	8873.9

Lat.		Latitude 16° to 17°—Meridional arcs.						Latitude 16°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 16° 30′		Value of 1′	Continuous sums of minutes from latitude 16° 00′		Longitude.	X	Y
°	′	Meters.	″	Meters.	Meters.	′	Meters.	° ′	Meters.	Meters.
16	00	30.737			1844.21					
	1	7	1	30.74	.21	1	1 844.2	0 1	1 783.9	0.1
	2	7	2	61.48	.21	2	3 688.4	2	3 567.9	0.3
	3	7	3	92.21	.22	3	5 532.6	3	5 351.8	0.6
	4	7	4	122.95	.22	4	7 376.9	4	7 135.7	1.1
16	05	30.737	5	153.69	1844.22	5	9 221.1	0 5	8 919.7	1.8
	6	7	6	184.43	.23	6	11 065.3	6	10 703.6	2.6
	7	7	7	215.17	.23	7	12 909.5	7	12 487.5	3.5
	8	7	8	245.91	.23	8	14 753.7	8	14 271.4	4.6
	9	7	9	276.64	.23	9	16 598.0	9	16 055.4	5.8
16	10	30.737	10	307.38	1844.24	10	18 442.2	0 10	17 839.3	7.2
	11	7	1	338.12	.24	1	20 286.5	15	26 758.9	16.1
	12	7	2	368.86	.24	2	22 130.7	20	35 678.6	28.6
	13	7	3	399.60	.25	3	23 975.0	25	44 598.2	44.7
	14	7	4	430.34	.25	4	25 819.2	30	53 517.9	64.4
16	15	30.738	15	461.07	1844.25	15	27 663.5	0 35	62 437.5	87.6
	16	8	6	491.81	.26	6	29 507.7	40	71 357.1	114.4
	17	8	7	522.55	.26	7	31 352.0	45	80 276.7	144.8
	18	8	8	553.29	.26	8	33 196.3	50	89 196.3	178.8
	19	8	9	584.03	.26	9	35 040.5	55	98 115.9	216.4
16	20	30.738	20	614.77	1844.27	20	36 884.8	1 00	107 035.4	257.5
	21	8	1	645.50	.27	1	38 729.1	05	115 955.0	302.2
	22	8	2	676.24	.27	2	40 573.3	10	124 874.5	350.4
	23	8	3	706.98	.28	3	42 417.6	15	133 794.0	402.3
	24	8	4	737.72	.28	4	44 261.9	20	142 713.5	457.7
16	25	30.738	25	768.46	1844.28	25	46 106.2	1 25	151 633.0	516.7
	26	8	6	799.20	.28	6	47 950.5	30	160 552.4	579.3
	27	8	7	829.93	.29	7	49 794.7	35	169 471.8	645.4
	28	8	8	860.67	.29	8	51 639.0	40	178 391.2	715.2
	29	8	9	891.41	.29	9	53 483.3	45	187 310.5	788.5
16	30	30.738	30	922.15	1844.30	30	55 327.6	1 50	196 229.8	865.4
	31	8	1	952.89	.30	1	57 171.9	55	205 149.1	945.8
	32	8	2	983.63	.30	2	59 016.2	2 00	214 068	1 030
	33	8	3	1 014.36	.31	3	60 860.5	3 00	321 097	2 317
	34	8	4	1 045.10	.31	4	62 704.8	4 00	428 117	4 119
16	35	30.739	35	1 075.84	1844.31	35	64 549.2	5 00	535 127	6 436
	36	9	6	1 106.58	.31	6	66 393.5	6 00	642 126	9 268
	37	9	7	1 137.32	.32	7	68 237.8	7 00	749 110	12 614
	38	9	8	1 168.06	.32	8	70 082.1	8 00	856 075	16 476
	39	9	9	1 198.79	.32	9	71 926.4	9 00	963 022	20 852
16	40	30.739	40	1 229.53	1844.33	40	73 770.8	10 00	1 069 946	25 741
	41	9	1	1 260.27	.33	1	75 615.1	11 00	1 176 845	31 145
	42	9	2	1 291.01	.33	2	77 459.4	12 00	1 283 717	37 064
	43	9	3	1 321.75	.34	3	79 303.8	13 00	1 390 559	43 497
	44	9	4	1 352.48	.34	4	81 148.1	14 00	1 497 369	50 444
16	45	30.739	45	1 383.22	1844.34	45	82 992.4	15 00	1 604 146	57 904
	46	9	6	1 413.96	.34	6	84 836.8	16 00	1 710 883	65 878
	47	9	7	1 444.70	.35	7	86 681.1	17 00	1 817 582	74 365
	48	9	8	1 475.44	.35	8	88 525.5	18 00	1 924 239	83 366
	49	9	9	1 506.18	.35	9	90 369.8	19 00	2 030 851	92 880
16	50	30.739	50	1 536.91	1844.36	50	92 214.2	20 00	2 137 416	102 906
	51	9	1	1 567.65	.36	1	94 058.5	21 00	2 243 932	113 445
	52	9	2	1 598.39	.36	2	95 902.9	22 00	2 350 395	124 496
	53	9	3	1 629.13	.36	3	97 747.2	23 00	2 456 804	136 059
	54	39	4	1 659.87	.37	4	99 591.6	24 00	2 563 157	148 134
16	55	30.740	55	1 690.61	1844.37	55	101 436.0	25 00	2 669 451	160 720
	56	0	6	1 721.34	.37	6	103 280.3	26 00	2 775 682	173 818
	57	0	7	1 752.08	.38	7	105 124.7	27 00	2 881 849	187 427
	58	0	8	1 782.82	.38	8	106 969.1	28 00	2 987 949	201 546
	59	0	9	1 813.56	.38	9	108 813.5	29 00	3 093 980	216 175
16	60	30.740	60	1 844.30	1844.39	60	110 657.8	30 00	3 199 941	231 315

Latitude 17° to 18°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
17 00	29.580	59.16	88.74	118.32	147.90	177.48	207.06	236.64	266.22	1774.8	3549.6	5324.4	7099.2	8873.9
1	.577	.16	.73	.31	.89	.46	.04	.62	.20	4.6	9.3	3.9	8.6	3.1
2	.574	.15	.72	.30	.87	.45	.02	.60	.17	4.5	9.0	3.4	7.9	2.3
3	.572	.15	.72	.29	.86	.43	7.01	.58	.15	4.3	8.6	3.0	7.3	1.6
4	.569	.14	.71	.28	.85	.42	6.99	.56	.12	4.2	8.3	2.5	6.6	0.8
17 05	29.567	59.14	88.70	118.26	147.83	177.40	206.97	236.53	266.10	1774.0	3548.0	5322.0	7096.0	8870.0
6	.564	.13	.69	.25	.82	.38	.95	.51	.08	3.8	7.7	1.5	5.4	69.2
7	.561	.13	.68	.24	.81	.37	.93	.49	.05	3.7	7.4	1.0	4.8	8.4
8	.559	.12	.68	.23	.80	.35	.92	.47	.03	3.5	7.0	0.6	4.1	7.7
9	.556	.12	.67	.22	.78	.34	.90	.45	6.00	3.4	6.7	20.1	3.5	6.9
17 10	29.554	59.11	88.66	118.21	147.77	177.32	206.88	236.43	5.98	1773.2	3546.4	5319.6	7092.9	8866.1
11	.551	.10	.65	.20	.76	.30	.86	.41	.96	3.0	6.1	9.1	2.3	5.3
12	.548	.10	.64	.19	.74	.29	.84	.39	.93	2.9	5.8	8.7	1.6	4.5
13	.546	.09	.64	.18	.73	.27	.82	.37	.91	2.7	5.4	8.2	1.0	3.7
14	.543	.09	.63	.17	.72	.26	.80	.35	.88	2.6	5.1	7.8	90.3	2.9
17 15	29.540	59.08	88.62	118.16	147.70	177.24	206.79	236.32	265.86	1772.4	3544.8	5317.3	7089.7	8862.1
16	.538	.07	.61	.15	.69	.22	.77	.30	.84	2.2	4.5	6.8	9.1	1.3
17	.535	.07	.60	.14	.68	.21	.75	.28	.81	2.1	4.2	6.3	8.4	60.5
18	.532	.06	.60	.13	.67	.19	.73	.26	.79	1.9	3.8	5.9	7.8	59.7
19	.530	.06	.59	.12	.65	.18	.71	.24	.77	1.8	3.5	5.4	7.1	8.9
17 20	29.527	59.05	88.58	118.11	147.64	177.16	206.69	236.22	265.74	1771.6	3543.2	5314.9	7086.5	8858.1
21	.524	.05	.57	.10	.63	.14	.67	.20	.72	1.4	2.9	4.4	5.9	7.3
22	.522	.04	.56	.09	.61	.13	.65	.18	.69	1.3	2.6	3.9	5.2	6.5
23	.519	.04	.56	.08	.60	.11	.63	.15	.67	1.1	2.2	3.5	4.6	5.7
24	.516	.03	.55	.07	.58	.10	.61	.13	.64	1.0	1.9	3.0	3.9	4.9
17 25	29.514	59.03	88.54	118.05	147.57	177.08	206.60	236.11	265.62	1770.8	3541.6	5312.5	7083.3	8854.1
26	.511	.02	.53	.04	.56	.06	.58	.09	.60	0.6	1.3	2.1	2.7	3.3
27	.508	.02	.52	.03	.54	.05	.56	.07	.57	0.5	1.0	1.6	2.0	2.5
28	.506	.01	.52	.02	.53	.03	.54	.04	.55	0.3	0.6	1.1	1.4	1.7
29	.503	.01	.51	.01	.51	.02	.52	.02	.52	0.2	0.3	0.6	0.7	0.9
17 30	29.500	59.00	88.50	118.00	147.50	177.00	206.50	236.00	265.50	1770.0	3540.0	5310.1	7080.1	8850.1
31	.498	9.00	.49	7.99	.49	6.98	.48	5.98	.48	69.8	39.7	09.6	79.4	49.3
32	.495	8.99	.48	.98	.47	.97	.46	.96	.45	9.7	9.4	9.1	8.8	8.5
33	.492	.99	.48	.97	.46	.95	.44	.94	.43	9.5	9.0	8.6	8.1	7.6
34	.489	.98	.47	.96	.45	.94	.42	.92	.40	9.4	8.7	8.1	7.5	6.8
17 35	29.487	58.98	88.46	117.94	147.43	176.92	206.41	235.89	265.38	1769.2	3538.4	5307.6	7076.8	8846.0
36	.484	.97	.45	.93	.42	.90	.39	.87	.36	9.0	8.1	7.1	6.2	5.2
37	.481	.97	.44	.92	.41	.89	.37	.85	.33	8.9	7.8	6.6	5.5	4.4
38	.479	.96	.44	.91	.40	.87	.35	.83	.31	8.7	7.4	6.2	4.9	3.6
39	.476	.96	.43	.90	.38	.86	.33	.81	.28	8.6	7.1	5.7	4.2	2.8
17 40	29.473	58.95	88.42	117.89	147.37	176.84	206.31	235.79	265.26	1768.4	3536.8	5305.2	7073.6	8842.0
41	.471	.94	.41	.88	.36	.82	.29	.77	.24	8.2	6.5	4.7	2.9	1.2
42	.468	.94	.40	.87	.34	.81	.27	.75	.21	8.1	6.2	4.2	2.3	40.4
43	.465	.93	.40	.86	.33	.79	.25	.72	.19	7.9	5.8	3.7	1.6	39.5
44	.462	.93	.39	.85	.31	.78	.23	.70	.16	7.8	5.5	3.2	1.0	8.7
17.45	29.460	58.92	88.38	117.83	147.30	176.76	206.22	235.68	265.14	1767.6	3535.2	5302.7	7070.3	8837.9
46	.457	.91	.37	.82	.29	.74	.20	.66	.11	7.4	4.9	2.2	69.6	7.1
47	.454	.91	.36	.81	.27	.73	.18	.64	.09	7.3	4.5	1.7	9.0	6.3
48	.451	.90	.35	.80	.26	.71	.16	.61	.06	7.1	4.2	1.3	8.3	5.4
49	.449	.90	.35	.79	.24	.70	.14	.59	.03	7.0	3.8	0.8	7.7	4.6
17 50	29.446	58.89	88.34	117.78	147.23	176.68	206.12	235.57	265.01	1766.8	3533.5	5300.3	7067.0	8833.8
51	.443	.89	.33	.77	.22	.66	.10	.55	4.99	6.6	3.2	299.8	6.3	3.0
52	.441	.88	.32	.76	.20	.64	.08	.53	.96	6.4	2.9	9.3	5.7	2.2
53	.438	.88	.31	.75	.19	.63	.06	.50	.94	6.3	2.5	8.8	5.0	1.3
54	.435	.87	.31	.74	17	.61	.04	.48	.91	6.1	2.2	8.3	4.4	30.5
17 55	29.432	58.87	88.30	117.72	147.16	176.59	206.03	235.46	264.89	1765.9	3531.9	5297.8	7063.7	8829.7
56	.430	.86	.29	.71	.15	.58	6.01	.44	.87	5.8	1.6	7.3	3.0	8.9
57	.427	.86	.28	.70	.13	.56	5.99	.42	.84	5.6	1.2	6.8	2.4	8.0
58	.424	.85	.27	.69	.12	.54	.97	.39	.82	5.4	0.9	6.3	1.7	7.2
59	.421	.85	.26	.68	.10	.53	.95	.37	.79	5.3	0.5	5.8	1.1	6.3
17 60	29.418	58.84	88.26	117.67	147.09	176.51	205.93	235.35	264.77	1765.1	3530.2	5295.3	7060.4	8825.5

Lat.		Latitude 17° to 18°—Meridional arcs.						Latitude 17°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 17° 30′		Value of 1′	Continuous sums of minutes from latitude 17° 00′		Longitude.	X	Y
°	′	*Meters.*	″	*Meters.*	*Meters.*	′	*Meters.*	° ′	*Meters.*	*Meters.*
17	00	30.740			1844.39					
	1	0	1	30.74	.39	1	1 844.4	0 1	1 774.8	0.1
	2	0	2	61.48	.39	2	3 688.8	2	3 549.6	0.3
	3	0	3	92.22	.39	3	5 533.2	3	5 324.4	0.7
	4	0	4	122.97	.40	4	7 377.6	4	7 099.2	1.2
17	05	30.740	5	153.71	1844.40	5	9 222.0	0 5	8 873.9	1.9
	6	0	6	184.45	.40	6	11 066.4	6	10 648.7	2.7
	7	0	7	215.19	.41	7	12 910.8	7	12 423.5	3.7
	8	0	8	245.93	.41	8	14 755.2	8	14 198.3	4.8
	9	0	9	276.67	.41	9	16 599.6	9	15 973.1	6.1
17	10	30.740	10	307.41	1844.42	10	18 444.0	0 10	17 747.9	7.5
	11	0	1	338.15	.42	11	20 288.5	15	26 621.8	17.0
	12	0	2	368.90	.42	12	22 132.9	20	35 495.8	30.2
	13	0	3	399.64	.43	13	23 977.3	25	44 369.6	47.2
	14	0	4	430.38	.43	14	25 821.7	30	53 243.6	67.9
17	15	30.741	15	461.12	1844.43	15	27 666.2	0 35	62 117.5	92.4
	16	1	6	491.86	.44	16	29 510.6	40	70 991.4	120.7
	17	1	7	522.60	.44	17	31 355.0	45	79 865.3	152.8
	18	1	8	553.34	.44	18	33 199.5	50	88 739.1	188.7
	19	1	9	584.09	.44	19	35 043.9	55	97 613.0	228.3
17	20	30.741	20	614.83	1844.45	20	36 888.4	1 00	106 486.9	271.7
	21	1	1	645.57	.45	21	38 732.8	05	115 360.7	318.8
	22	1	2	676.31	.45	22	40 577.3	10	124 234.5	369.8
	23	1	3	707.05	.46	23	42 421.7	15	133 108.3	424.5
	24	1	4	737.79	.46	24	44 266.2	20	141 982.0	483.0
17	25	30.741	25	768.53	1844.46	25	46 110.7	1 25	150 855.7	545.2
	26	1	6	799.27	.47	26	47 955.1	30	159 729.4	611.3
	27	1	7	830.02	.47	27	49 799.6	35	168 603.1	681.1
	28	1	8	860.76	.47	28	51 644.1	40	177 476.8	754.7
	29	1	9	891.50	.48	29	53 488.6	45	186 350.4	832.1
17	30	30.741	30	922.24	1844.48	30	55 333.0	1 50	195 223.9	913.2
	31	1	1	952.98	.48	31	57 177.5	55	204 097.5	998.1
	32	1	2	983.72	.49	32	59 022.0	2 00	212 971	1 087
	33	1	3	1 014.46	.49	33	60 866.5	3 00	319 450	2 445
	34	2	4	1 045.21	.49	34	62 711.0	4 00	425 920	4 347
17	35	30.742	35	1 075.95	1844.50	35	64 555.5	5 00	532 378	6 792
	36	2	6	1 106.69	.50	36	66 400.0	6 00	638 824	9 779
	37	2	7	1 137.43	.50	37	68 244.5	7 00	745 253	13 310
	38	2	8	1 168.17	.50	38	70 089.0	8 00	851 662	17 386
	39	2	9	1 198.91	.51	39	71 933.5	9 00	958 049	22 004
17	40	30.742	40	1 229.65	1844.51	40	73 778.0	10 00	1 064 411	27 164
	41	2	1	1 260.39	.51	41	75 622.5	11 00	1 170 745	32 867
	42	2	2	1 291.14	.52	42	77 467.0	12 00	1 277 049	39 112
	43	2	3	1 321.88	.52	43	79 311.6	13 00	1 383 320	45 899
	44	2	4	1 352.62	.52	44	81 156.1	14 00	1 489 555	53 229
17	45	30.742	45	1 383.36	1844.53	45	83 000.6	15 00	1 595 750	61 101
	46	2	6	1 414.10	.53	46	84 845.1	16 00	1 701 905	69 515
	47	2	7	1 444.84	.53	47	86 689.7	17 00	1 808 015	78 470
	48	2	8	1 475.58	.54	48	88 534.2	18 00	1 914 078	87 967
	49	2	9	1 506.33	.54	49	90 378.7	19 00	2 020 091	98 005
17	50	30.742	50	1 537.07	1844.54	50	92 223.3	20 00	2 126 051	108 583
	51	2	1	1 567.81	.55	51	94 067.8	21 00	2 231 956	119 702
	52	2	2	1 598.55	.55	52	95 912.3	22 00	2 337 803	131 362
	53	3	3	1 629.29	.55	53	97 756.9	23 00	2 443 589	143 562
	54	3	4	1 660.03	.55	54	99 601.4	24 00	2 549 312	156 301
17	55	30.743	55	1 690.77	1844.56	55	101 446.0	25 00	2 654 968	169 578
	56	3	6	1 721.51	.56	56	103 290.6	26 00	2 760 554	183 395
	57	3	7	1 752.26	.56	57	105 135.1	27 00	2 866 069	197 751
	58	3	8	1 783.00	.57	58	106 979.7	28 00	2 971 510	212 646
	59	3	9	1 813.74	.57	59	108 824.3	29 00	3 076 874	228 079
17	60	30.743	60	1 844.48	1844.57	60	110 668.8	30 00	3 182 157	244 048

Latitude 18° to 19°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
18 00	29.418	58.84	88.26	117.67	147.09	176.51	205.93	235.35	264.77	1765.1	3530.2	5295.3	7060.4	8825.5
1	.416	.83	.25	.66	.08	.49	.91	.33	.75	4.9	29.9	4.8	59.7	4.7
2	.413	.83	.24	.65	.06	.48	.89	.31	.72	4.8	9.5	4.3	9.1	3.9
3	.410	.82	.23	.64	.05	.46	.87	.28	.70	4.6	9.2	3.8	8.4	3.0
4	.407	.82	.22	.63	.03	.44	.85	.26	.67	4.4	8.8	3.3	7.8	2.2
18 05	29.405	58.81	88.21	117.61	147.02	176.43	205.84	235.24	264.65	1764.3	3528.5	5292.8	7057.1	8821.4
6	.402	.80	.21	.60	7.01	.41	.82	.22	.62	4.1	8.2	2.3	6.4	20.6
7	.399	.80	.20	.59	6.99	.39	.80	.20	.60	3.9	7.9	1.8	5.8	19.7
8	.396	.79	.19	.58	.98	.38	.78	.17	.57	3.8	7.5	1.3	5.1	8.9
9	.393	.79	.18	.57	.96	.36	.76	.15	.55	3.6	7.2	0.8	4.5	8.0
18 10	29.391	58.78	88.17	117.56	146.95	176.34	205.74	235.13	264.52	1763.4	3526.9	5290.3	7053.8	8817.2
11	.388	.78	.16	.55	.94	.32	.72	.11	.49	3.2	6.6	89.8	3.1	6.4
12	.385	.77	.15	.54	.92	.31	.70	.08	.47	3.1	6.2	9.3	2.4	5.5
13	.382	.77	.15	.53	.91	.29	.68	.06	.44	2.9	5.9	8.8	1.8	4.7
14	.379	.76	.14	.52	.89	.28	.66	.04	.42	2.8	5.5	8.3	1.1	3.8
18 15	29.377	58.76	88.13	117.50	146.88	176.26	205.64	235.01	264.39	1762.6	3525.2	5287.8	7050.4	8813.0
16	.374	.75	.12	.49	.87	.24	.62	4.99	.36	2.4	4.9	7.3	49.7	2.2
17	.371	.75	.11	.48	.85	.23	.60	.97	.34	2.3	4.5	6.8	9.1	1.3
18	.368	.74	.11	.47	.84	.21	.58	.95	.31	2.1	4.2	6.3	8.4	10.5
19	.365	.74	.10	.46	.82	.20	.56	.92	.29	2.0	3.8	5.8	7.8	09.6
18 20	29.363	58.73	88.09	117.45	146.81	176.18	205.54	234.90	264.26	1761.8	3523.5	5285.3	7047.1	8808.8
21	.360	.72	.08	.44	.80	.16	.52	.88	.24	1.6	3.2	4.8	6.4	8.0
22	.357	.72	.07	.43	.78	.14	.50	.86	.21	1.4	2.8	4.3	5.7	7.1
23	.354	.71	.06	.42	,77	.13	.48	.83	.19	1.3	2.5	3.7	5.1	6.3
24	.351	.71	.05	.41	.75	.11	.46	.81	.16	1.1	2.1	3.2	4.4	5.4
18 25	29.349	58.70	88.05	117.39	146.74	176.09	205.44	234.79	264.14	1760.9	3521.8	5282.7	7043.7	8804.6
26	.346	.69	.04	.38	.73	.07	.42	.77	.11	0.7	1.5	2.2	3.0	3.7
27	.343	.69	.03	.37	.71	.06	.40	.75	.09	0.6	1.1	1.7	2.3	2.9
28	.340	.68	.02	.36	.70	.04	.38	.72	.06	0.4	0.8	1.2	1.7	2.0
29	.337	.68	.01	.35	.68	.03	.36	.70	.04	0.3	0.4	0.7	1.0	1.2
18 30	29.334	58.67	88.00	117.34	146.67	176.01	205.34	234.68	264.01	1760.1	3520.1	5280.2	7040.3	8800.3
31	.332	.66	7.99	.33	.66	5.99	.32	.66	3.98	59.9	19.8	79.7	39.6	799.5
32	.329	.66	.99	.32	.64	.97	.30	.63	.96	9.7	9.4	9.2	8.9	8.6
33	.326	.65	.98	.30	.63	.96	.28	.61	.93	9.6	9.1	8.6	8.2	7.7
34	.323	.65	.97	.29	.61	.94	.26	.59	.91	9.4	8.7	8.1	7.5	6.9
18 35	29.320	58.64	87.96	117.28	146.60	175.92	205.24	234.56	263.88	1759.2	3518.4	5277.6	7036.8	8796.1
36	.317	.63	.95	.27	.59	.90	.22	.54	.85	9.0	8.1	7.1	6.1	5.2
37	.315	.63	.94	.26	.57	.89	.20	.52	.83	8.9	7.7	6.6	5.4	4.4
38	.312	.62	.94	.24	.56	.87	.18	.50	.80	8.7	7.4	6.1	4.8	3.5
39	.309	.62	.93	.23	.54	.86	.16	.47	.78	8.6	7.0	5.6	4.1	2.7
18 40	29.306	58.61	87.92	117.22	146.53	175.84	205.14	234.45	263.75	1758.4	3516.7	5275.1	7033.4	8791.8
41	.303	.60	.91	.21	.52	.82	.12	.43	.72	8.2	6.4	4.6	2.7	0.9
42	.300	.60	.90	.20	.50	.80	.10	.40	.70	8.0	6.0	4.1	2.0	90.1
43	.297	.59	.89	.19	.49	.79	.08	.38	.67	7.9	5.7	3.5	1.4	89.2
44	.295	.59	.88	.18	.47	.77	.06	.36	.65	7.7	5.3	3.0	0.7	8.4
18 45	29.292	58.58	87.87	117.16	146.46	175.75	205.04	234.33	263.62	1757.5	3515.0	5272.5	7030.0	8787.5
46	.289	.57	.87	.15	.45	.73	.02	.31	.59	7.3	4.7	2.0	29.3	6.6
47	.286	.57	.86	.14	.43	.71	5.00	.29	.57	7.1	4.3	1.5	8.6	5.8
48	.283	.56	.85	.13	.42	.70	4.98	.27	.54	7.0	4.0	0.9	7.9	4.9
49	.280	.56	.84	.12	.40	.68	.96	.24	.52	6.8	3.6	70.4	7.2	4.1
18 50	29.277	58.55	87.83	117.11	146.39	175.66	204.94	234.22	263.49	1756.6	3513.3	5269.9	7026.5	8783.2
51	.274	.55	.82	.10	.38	.64	.92	.20	.46	6.4	2.9	9.4	5.8	2.3
52	.271	.54	.81	.09	.36	.63	.90	.17	.44	6.3	2.6	8.9	5.1	1.4
53	.269	.54	.81	.07	.35	.61	.88	.15	.41	6.1	2.2	8.3	4.4	80.6
54	.266	.53	.80	.06	.33	.59	.86	.13	.39	5.9	1.9	7.8	3.7	79.7
18 55	29.263	58.53	87.79	117.05	146.32	175.58	204.84	234.10	263.37	1755.8	3511.5	5267.3	7023.0	8778.8
56	.260	.52	.78	.04	.30	.56	.82	.08	.35	5.6	1.2	6.8	2.3	7.9
57	.257	.52	.77	.03	.29	.54	.80	.06	.31	5.4	0.8	6.3	1.6	7.1
58	.254	.51	.76	.01	.27	.52	.78	.04	.28	5.2	0.5	5.7	1.0	6.2
59	.251	.51	.75	7.00	.26	.51	.76	4.01	.26	5.1	10.1	5.2	20.3	5.4
18 60	29.248	58.50	87.74	116.99	146.24	175.49	204.74	233.99	263.23	1754.9	3509.8	5264.7	7019.6	8774.5

Lat		Latitude 18° to 19°—Meridional arcs.						Latitude 18°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 18° 30′		Value of 1′	Continuous sums of minutes from latitude 18° 00′		Longitude.	X	Y
°	′	Meters.	″	Meters.	Meters.	′	Meters.	° ′	Meters.	Meters.
18	00	30.743			1844.57					
	1	3	1	30.74	.58	1	1 844.6	0 1	1 765.1	0.1
	2	3	2	61.49	.58	2	3 689.2	2	3 530.2	0.3
	3	3	3	92.23	.58	3	5 533.7	3	5 295.3	0.7
	4	3	4	122.98	.59	4	7 378.3	4	7 060.4	1.3
18	05	30.743	5	153.72	1844.59	5	9 222.9	0 5	8 825.5	2.0
	6	3	6	184.47	.59	6	11 067.5	6	10 590.6	2.9
	7	3	7	215.21	.60	7	12 912.1	7	12 355.7	3.9
	8	3	8	245.96	.60	8	14 756.7	8	14 120.8	5.1
	9	3	9	276.70	.60	9	16 601.3	9	15 886.0	6.4
18	10	30.743	10	307.45	1844.61	10	18 445.9	0 10	17 651.1	7.9
	11	3	1	338.19	.61	1	20 290.5	15	26 476.6	17.8
	12	4	2	368.93	.61	2	22 135.1	20	35 302.1	31.7
	13	4	3	399.68	.62	3	23 979.8	25	44 127.7	49.6
	14	4	4	430.42	.62	4	25 824.4	30	52 953.2	71.4
18	15	30.744	15	461.17	1844.62	15	27 669.0	0 35	61 778.7	97.2
	16	4	6	491.91	.62	6	29 513.6	40	70 604.2	126.9
	17	4	7	522.66	.63	7	31 358.2	45	79 429.7	160.6
	18	4	8	553.40	.63	8	33 202.9	50	88 255.1	198.3
	19	4	9	584.15	.63	9	35 047.5	55	97 080.6	240.0
18	20	30.744	20	614.89	1844.64	20	36 892.2	1 00	105 906.0	285.6
	21	4	1	645.64	.64	1	38 736.8	05	114 731.4	335.2
	22	4	2	676.38	.64	2	40 581.4	10	123 556.8	388.7
	23	4	3	707.12	.65	3	42 426.1	15	132 382.1	446.2
	24	4	4	737.87	.65	4	44 270.7	20	141 207.5	507.7
18	25	30.744	25	768.61	1844.65	25	46 115.4	1 25	150 032.8	573.2
	26	4	6	799.36	.66	6	47 960.0	30	158 858.0	642.6
	27	4	7	830.10	.66	7	49 804.7	35	167 683.3	716.0
	28	4	8	860.85	.66	8	51 649.4	40	176 508.5	793.3
	29	4	9	891.59	.67	9	53 494.0	45	185 333.6	874.6
18	30	30.744	30	922.33	1844.67	30	55 338.7	1 50	194 158.8	959.9
	31	5	1	953.08	.67	1	57 183.4	55	202 983.8	1 049.2
	32	5	2	983.83	.68	2	59 028.1	2 00	211 809	1 142
	33	5	3	1 014.57	.68	3	60 872.7	3 00	317 706	2 570
	34	5	4	1 045.31	.68	4	62 717.4	4 00	423 593	4 569
18	35	30.745	35	1 076.06	1844.69	35	64 562.1	5 00	529 468	7 139
	36	5	6	1 106.80	.69	6	66 406.8	6 00	635 328	10 280
	37	5	7	1 137.55	.69	7	68 251.5	7 00	741 169	13 992
	38	5	8	1 168.29	.70	8	70 096.2	8 00	846 989	18 275
	39	5	9	1 199.04	.70	9	71 940.9	9 00	952 784	23 129
18	40	30.745	40	1 229.78	1844.70	40	73 785.6	10 00	1 058 552	28 553
	41	5	1	1 260.53	.71	1	75 630.3	11 00	1 164 289	34 547
	42	5	2	1 291.27	.71	2	77 475.0	12 00	1 269 991	41 112
	43	5	3	1 322.02	.71	3	79 319.7	13 00	1 375 657	48 246
	44	5	4	1 352.76	.72	4	81 164.4	14 00	1 481 283	55 950
18	45	30.745	45	1 383.50	1844.72	45	83 009.2	15 00	1 586 865	64 224
	46	5	6	1 414.25	.72	6	84 853.9	16 00	1 692 402	73 067
	47	5	7	1 444.99	.73	7	86 698.6	17 00	1 797 890	82 479
	48	5	8	1 475.74	.73	8	88 543.3	18 00	1 903 324	92 461
	49	6	9	1 506.48	.73	9	90 388.0	19 00	2 008 704	103 011
18	50	30.746	50	1 537.23	1844.74	50	92 232.8	20 00	2 114 025	114 128
	51	6	1	1 567.97	.74	1	94 077.5	21 00	2 219 285	125 813
	52	6	2	1 598.72	.74	2	95 922.3	22 00	2 324 480	138 066
	53	6	3	1 629.46	.75	3	97 767.0	23 00	2 429 607	150 887
	54	6	4	1 660.21	.75	4	99 611.8	24 00	2 534 664	164 274
18	55	30.746	55	1 690.95	1844.75	55	101 456.5	25 00	2 639 647	178 227
	56	6	6	1 721.69	.76	6	103 301.3	26 09	2 744 554	192 746
	57	6	7	1 752.44	.76	7	105 146.1	27 00	2 849 381	207 831
	58	6	8	1 783.18	.76	8	106 990.8	28 00	2 954 124	223 482
	59	6	9	1 813.93	.77	9	108 835.6	29 00	3 058 782	239 697
18	60	30.746	60	1 844.67	1844.77	60	110 680.4	30 00	3 163 350	256 476

Latitude 19° to 20°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
19 00	29.248	58.50	87.74	116.99	146.24	175.49	204.74	233.99	263.23	1754.9	3509.8	5264.7	7019.6	8774.5
1	.245	.49	.74	.98	.23	.47	.72	.97	.20	4.7	9.4	4.2	8.9	3.6
2	.242	.49	.73	.97	.21	.45	.70	.94	.18	4.5	9.1	3.6	8.2	2.7
3	.240	.48	.72	.96	.20	.44	.68	.92	.15	4.4	8.7	3.1	7.5	1.9
4	.237	.48	.71	.95	.18	.42	.66	.89	.13	4.2	8.4	2.5	6.8	1.0
19 05	29.234	58.47	87.70	116.93	146.17	175.40	204.63	233.87	263.10	1754.0	3508.0	5262.0	7016.1	8770.1
6	.231	.46	.69	.92	.16	.38	.61	.85	.07	3.8	7.7	1.5	5.4	69.2
7	.228	.46	.68	.91	.14	.36	.59	.82	.05	3.6	7.3	1.0	4.7	8.3
8	.225	.45	.68	.90	.13	.35	.57	.80	.02	3.5	7.0	60.4	4.0	7.5
9	.222	.45	.67	.89	.11	.33	.55	.77	63.00	3.3	6.6	59.9	3.3	6.6
19 10	29.219	58.44	87.66	116.88	146.10	175.31	204.53	233.75	262.97	1753.1	3506.3	5259.4	7012.6	8765.7
11	.216	.43	.65	.87	.09	.29	.51	.73	.94	2.9	5.9	8.9	1.9	4.8
12	.213	.43	.64	.86	.07	.28	.49	.70	.92	2.8	5.6	8.4	1.2	3.9
13	.210	.42	.63	.84	.06	.26	.47	.68	.89	2.6	5.2	7.8	10.4	3.1
14	.207	.42	.62	.83	.04	.24	.45	.66	.87	2.4	4.9	7.3	09.7	2.2
19 15	29.204	58.41	87.61	116.82	146.03	175.23	204.43	233.63	262.84	1752.3	3504.5	5256.8	7009.0	8761.3
16	.201	.40	.60	.81	.01	.21	.41	.61	.81	2.1	4.1	6.3	8.3	60.4
17	.198	.40	.60	.80	6.00	.19	.39	.59	.79	1.9	3.8	5.7	7.6	59.5
18	.196	.39	.59	.78	5.98	.17	.37	.57	.76	1.7	3.4	5.2	6.9	8.7
19	.193	.39	.58	.77	.97	.16	.35	.54	.74	1.6	3.1	4.6	6.2	7.8
19 20	29.190	58.38	87.57	116.76	145.95	175.14	204.33	233.52	262.71	1751.4	3502.7	5254.1	7005.5	8756.9
21	.187	.37	.56	.75	.94	.12	.31	.50	.68	1.2	2.4	3.6	4.8	6.0
22	.184	.37	.55	.74	.92	.10	.29	.47	.66	1.0	2.0	3.0	4.1	5.1
23	.181	.36	.54	.72	.91	.09	.27	.45	.63	0.9	1.7	2.5	3.3	4.2
24	.178	.36	.53	.71	.89	.07	.25	.42	.60	0.7	1.3	1.9	2.6	3.3
19 25	29.175	58.35	87.52	116.70	145.88	175.05	204.22	233.40	262.57	1750.5	3501.0	5251.4	7001.9	8752.4
26	.172	.34	.52	.69	.86	.03	.20	.38	.55	0.3	0.6	0.9	1.2	1.5
27	.169	.34	.51	.68	.85	.01	.18	.35	.52	0.1	500.3	50.4	7000.5	50.6
28	.166	.33	.50	.66	.83	5.00	.16	.33	.49	50.0	499.9	49.8	6999.7	49.7
29	.163	.33	.49	.65	.82	4.98	.14	.30	.47	49.8	9.6	9.3	9.0	8.8
19 30	29.160	58.32	87.48	116.64	145.80	174.96	204.12	233.28	262.44	1749.6	3499.2	5248.8	6998.3	8747.9
31	.157	.31	.47	.63	.79	.94	.10	.26	.41	9.4	8.8	8.3	7.6	7.0
32	.154	.31	.46	.62	.77	.92	.08	.23	.39	9.2	8.5	7.7	6.9	6.1
33	.151	.30	.45	.60	.76	.91	.06	.21	.36	9.1	8.1	7.2	6.1	5.2
34	.148	.30	.44	.59	.74	.89	.04	.18	.33	8.9	7.8	6.6	5.4	4.3
19 35	29.145	58.29	87.43	116.58	145.73	174.87	204.01	233.16	262.30	1748.7	3497.4	5246.1	6994.7	8743.4
36	.142	.28	.43	.57	.71	.85	3.99	.14	.28	8.5	7.0	5.6	4.0	2.5
37	.139	.28	.42	.56	.70	.83	.97	.11	.25	8.3	6.7	5.0	3.3	1.6
38	.136	.27	.41	.54	.68	.82	.95	.09	.22	8.2	6.3	4.5	2.6	40.7
39	.133	.27	.40	.53	.67	.80	.93	.06	.20	8.0	6.0	3.9	1.9	39.8
19 40	29.130	58.26	87.39	116.52	145.65	174.78	203.91	233.04	262.17	1747.8	3495.6	5243.4	6991.2	8738.9
41	.127	.25	.38	.51	.64	.76	.89	3.02	.14	7.6	5.2	2.8	90.5	8.0
42	.124	.25	.37	.50	.62	.74	.87	2.99	.12	7.4	4.9	2.3	89.7	7.1
43	.121	.24	.36	.48	.61	.73	.85	.97	.09	7.3	4.5	1.7	9.0	6.2
44	.118	.24	.35	.47	.59	.71	.83	.94	.06	7.1	4.2	1.2	8.2	5.3
19 45	29.115	58.23	87.34	116.46	145.58	174.69	203.80	232.92	262.03	1746.9	3493.8	5240.6	6987.5	8734.4
46	.112	.22	.34	.45	.56	.67	.78	.90	2.01	6.7	3.4	40.1	6.8	3.5
47	.109	.22	.33	.44	.55	.65	.76	.87	1.98	6.5	3.0	39.5	6.1	2.6
48	.106	.21	.32	.42	.53	.64	.74	.85	.95	6.4	2.7	9.0	5.3	1.7
49	.103	.21	.31	.41	.52	.62	.72	.82	.93	6.2	2.3	8.4	4.6	30.8
19 50	29.100	58.20	87.30	116.40	145.50	174.60	203.70	232.80	261.90	1746.0	3491.9	5237.9	6983.9	8729.9
51	.097	.19	.29	.39	.49	.58	.68	.78	.87	5.8	1.5	7.4	3.2	9.0
52	.094	.19	.28	.38	.47	.56	.66	.75	.84	5.6	1.2	6.8	2.4	8.1
53	.090	.18	.27	.36	.46	.54	.63	.73	.82	5.4	0.8	6.3	1.7	7.1
54	.087	.18	.26	.35	.44	.52	.61	.70	.79	5.2	0.5	5.7	0.9	6.2
19 55	29.084	58.17	87.25	116.34	145.43	174.51	203.59	232.68	261.76	1745.1	3490.1	5235.2	6980.2	8725.3
56	.081	.16	.24	.33	.41	.49	.57	.65	.73	4.9	89.7	4.6	79.5	4.4
57	.078	.16	.24	.32	.40	.47	.55	.63	.70	4.7	9.4	4.1	8.8	3.5
58	.075	.15	.23	.30	.38	.45	.52	.60	.68	4.5	9.0	3.5	8.0	2.5
59	.072	.15	.22	.29	.37	.43	.50	.58	.65	4.3	8.7	3.0	7.3	1.6
19 60	29.069	58.14	87.21	116.28	145.35	174.41	203.48	232.55	261.62	1744.1	3488.3	5232.4	6976.6	8720.7

Lat.		Latitude 19° to 20°—Meridional arcs.						Latitude 19°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 19° 30′		Value of 1′	Continuous sums of minutes from latitude 19° 00′		Longitude.	X	Y
°	′	Meters.	″	Meters.	Meters.	′	Meters.	° ′	Meters.	Meters.
19	00	30.746			1844.77					
	1	6	1	30.75	.77	1	1 844.8	0 1	1 754.9	0.1
	2	6	2	61.50	.78	2	3 689.5	2	3 509.8	0.3
	3	6	3	92.24	.78	3	5 534.3	3	5 264.7	0.7
	4	6	4	122.99	.78	4	7 379.1	4	7 019.6	1.3
19	05	30.746	5	153.74	1844.79	5	9 223.9	0 5	8 774.5	2.1
	6	6	6	184.49	.79	6	11 068.7	6	10 529.3	3.0
	7	7	7	215.24	.79	7	12 913.5	7	12 284.2	4.1
	8	7	8	245.98	.80	8	14 758.3	8	14 039.1	5.3
	9	7	9	276.73	.80	9	16 603.1	9	15 794.0	6.7
19	10	30.747	10	307.48	1844.80	10	18 447.9	0 10	17 548.9	8.3
	11	7	1	338.23	.81	1	20 292.7	15	26 323.4	18.7
	12	7	2	368.97	.81	2	22 137.5	20	35 097.8	33.2
	13	7	3	399.72	.81	3	23 982.3	25	43 872.3	51.9
	14	7	4	430.47	.82	4	25 827.1	30	52 646.7	74.8
19	15	30.747	15	461.22	1844.82	15	27 672.0	0 35	61 421.1	101.8
	16	7	6	491.97	.82	6	29 516.8	40	70 195.5	133.0
	17	7	7	522.71	.83	7	31 361.6	45	78 969.9	168.3
	18	7	8	553.46	.83	8	33 206.4	50	87 744.3	207.7
	19	7	9	584.21	.83	9	35 051.3	55	96 518.7	251.4
19	20	30.747	20	614.96	1844.84	20	36 896.1	1 00	105 293.0	299.2
	21	7	1	645.71	.84	1	38 741.0	05	114 067.3	351.1
	22	7	2	676.45	.84	2	40 585.8	10	122 841.6	407.2
	23	7	3	707.20	.85	3	42 430.6	15	131 615.9	467.4
	24	8	4	737.95	.85	4	44 275.5	20	140 390.1	531.8
19	25	30.748	25	768.70	1844.85	25	46 120.4	1 25	149 164.3	600.4
	26	8	6	799.45	.86	6	47 965.2	30	157 938.5	673.1
	27	8	7	830.19	.86	7	49 810.1	35	166 712.6	750.0
	28	8	8	860.94	.86	8	51 654.9	40	175 486.7	831.0
	29	8	9	891.69	.87	9	53 499.8	45	184 260.7	916.1
19	30	30.748	30	922.44	1844.87	30	55 344.7	1 50	193 034.7	1 005.5
	31	8	1	953.18	.87	1	57 189.6	55	201 808.7	1 099.0
	32	8	2	983.93	.88	2	59 034.4	2 00	210 583	1 197
	33	8	3	1 014.68	.88	3	60 879.3	3 00	315 866	2 692
	34	8	4	1 045.43	.89	4	62 724.2	4 00	421 138	4 786
19	35	30.748	35	1 076.18	1844.89	35	64 569.1	5 00	526 397	7 478
	36	8	6	1 106.92	.89	6	66 414.0	6 00	631 639	10 768
	37	8	7	1 137.67	.90	7	68 258.9	7 00	736 861	14 656
	38	8	8	1 168.42	.90	8	70 103.8	8 00	842 059	19 142
	39	8	9	1 199.17	.90	9	71 948.7	9 00	947 230	24 226
19	40	30.748	40	1 229.92	1844.91	40	73 793.6	10 00	1 052 369	29 907
	41	8	1	1 260.66	.91	1	75 638.5	11 00	1 157 475	36 186
	42	9	2	1 291.41	.91	2	77 483.4	12 00	1 262 544	43 061
	43	9	3	1 322.16	.92	3	79 328.3	13 00	1 367 572	50 534
	44	9	4	1 352.91	.92	4	81 173.3	14 00	1 472 556	58 603
19	45	30.749	45	1 383.66	1844.92	45	83 018.2	15 00	1 577 492	67 268
	46	9	6	1 414.40	.93	6	84 863.1	16 00	1 682 377	76 530
	47	9	7	1 445.15	.93	7	86 708.0	17 00	1 787 208	86 388
	48	9	8	1 475.90	.93	8	88 553.0	18 00	1 891 981	96 841
	49	9	9	1 506.65	.94	9	90 397.9	19 00	1 996 693	107 889
19	50	30.749	50	1 537.39	1844.94	50	92 242.8	20 00	2 101 342	119 532
	51	9	1	1 568.14	.94	1	94 087.8	21 00	2 205 922	131 770
	52	9	2	1 598.89	.95	2	95 932.7	22 00	2 310 430	144 601
	53	9	3	1 629.64	.95	3	97 777.7	23 00	2 414 864	158 026
	54	9	4	1 660.39	.95	4	99 622.6	24 00	2 519 221	172 044
19	55	30.749	55	1 691.13	1844.96	55	101 467.6	25 00	2 623 495	186 655
	56	9	6	1 721.88	.96	6	103 312.6	26 00	2 727 685	201 859
	57	9	7	1 752.63	.97	7	105 157.5	27 00	2 831 787	217 654
	58	49	8	1 783.38	.97	8	107 002.5	28 00	2 935 798	234 040
	59	50	9	1 814.13	.97	9	108 847.5	29 00	3 039 714	251 017
19	60	30.750	60	1 844.87	1844.98	60	110 692.4	30 00	3 143 531	268 585

Latitude 20° to 21°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
20 00	29.069	58.14	87.21	116.28	145.35	174.41	203.48	232.55	261.62	1744.1	3488.3	5232.4	6976.6	8720.7
1	.066	.13	.20	.27	.33	.39	.46	.53	.59	3.9	7.9	1.9	5.9	19.8
2	.063	.13	.19	.25	.32	.37	.44	.50	.57	3.7	7.5	1.3	5.1	8.9
3	.060	.12	.18	.24	.30	.36	.42	.48	.54	3.6	7.2	0.8	4.4	7.9
4	.057	.12	.17	.23	.29	.34	.40	.45	.51	3.4	6.8	30.2	3.6	7.0
20 05	29.054	58.11	87.16	116.21	145.27	174.32	203.37	232.43	261.48	1743.2	3486.4	5229.7	6972.9	8716.1
6	.051	.10	.15	.20	.25	.30	.35	.41	.46	3.0	6.0	9.1	2.2	5.2
7	.048	.10	.14	.19	.24	.28	.33	.38	.43	2.8	5.7	8.6	1.4	4.3
8	.044	.09	.13	.18	.22	.27	.31	.36	.40	2.7	5.3	8.0	70.7	3.3
9	.041	.09	.12	.16	.21	.25	.29	.33	.38	2.5	5.0	7.5	69.9	2.4
20 10	29.038	58.08	87.12	116.15	145.19	174.23	203.27	232.31	261.35	1742.3	3484.6	5226.9	6969.2	8711.5
11	.035	.07	.11	.14	.18	.21	.25	.29	.32	2.1	4.2	6.3	8.5	10.6
12	.032	.07	.10	.13	.16	.19	.23	.26	.29	1.9	3.8	5.8	7.7	09.7
13	.029	.06	.09	.11	.15	.17	.20	.24	.27	1.7	3.5	5.2	7.0	8.7
14	.026	.05	.08	.10	.13	.16	.18	.21	.24	1.6	3.1	4.7	6.2	7.8
20 15	29.023	58.04	87.07	116.09	145.12	174.14	203.16	232.19	261.21	1741.4	3482.7	5224.1	6965.5	8706.9
16	.020	.04	.06	.08	.10	.12	.14	.16	.18	1.2	2.3	3.5	4.8	6.0
17	.017	.03	.05	.07	.09	.10	.12	.14	.15	1.0	2.0	3.0	4.0	5.0
18	.014	.02	.04	.05	.07	.08	.09	.11	.13	0.8	1.7	2.4	3.3	4.1
19	.010	.02	.03	.04	.06	.06	.07	.09	.10	0.6	1.3	1.9	2.5	3.1
20 20	29.007	58.01	87.02	116.03	145.04	174.04	203.05	232.06	261.07	1740.4	3480.9	5221.3	6961.8	8702.2
21	.004	.00	.01	.02	.02	.02	.03	.04	.04	0.2	0.5	0.7	1.0	1.3
22	.001	8.00	7.00	6.00	5.01	4.00	3.01	2.01	1.01	40.0	80.1	20.2	60.3	700.3
23	8.998	7.99	6.99	5.99	4.99	3.99	2.98	1.99	0.99	39.9	79.8	19.6	59.5	699.4
24	.995	.99	.98	.98	.98	.97	.96	.96	.96	9.7	9.4	9.1	8.8	8.4
20 25	28.992	57.98	86.97	115.96	144.96	173.95	202.94	231.94	260.93	1739.5	3479.0	5218.5	6958.0	8697.5
26	.989	.97	.97	.95	.94	.93	.92	.91	.90	9.3	8.6	7.9	7.3	6.6
27	.986	.97	.96	.94	.93	.91	.90	.89	.87	9.1	8.2	7.4	6.5	5.7
28	.982	.96	.95	.93	.91	.90	.87	.86	.85	9.0	7.9	6.8	5.8	4.7
29	.979	.96	.94	.91	.90	.88	.85	.84	.82	8.8	7.5	6.3	5.0	3.8
20 30	28.976	57.95	86.93	115.90	144.88	173.86	202.83	231.81	260.79	1738.6	3477.1	5215.7	6954.3	8692.9
31	.973	.94	.92	.89	.86	.84	.81	.79	.76	8.4	6.7	5.1	3.5	1.9
32	.970	.94	.91	.88	85	.82	.79	.76	.73	8.2	6.4	4.6	2.8	1.0
33	.967	.93	.90	.86	.83	.80	.76	.74	.70	8.0	6.0	4.0	2.0	90.0
34	.964	.93	.89	.85	.82	.78	.74	.71	.67	7.8	5.7	3.5	1.3	89.1
20 35	28.960	57.92	86.88	115.84	144.80	173.76	202.72	231.69	260.65	1737.6	3475.3	5212.9	6950.5	8688.1
36	.957	.91	.87	.83	.78	.74	.70	.66	.62	7.4	4.9	2.3	49.7	7.2
37	.954	.91	.86	.82	.77	.72	.68	.64	.59	7.2	4.5	1.8	9.0	6.2
38	.951	.90	.85	.80	.75	.71	.65	.61	.56	7.1	4.2	1.2	8.2	5.3
39	.948	.90	.84	.79	.74	.69	.63	.59	.53	6.9	3.8	0.7	7.5	4.3
20 40	28.945	57.89	86.83	115.78	144.72	173.67	202.61	231.56	260.50	1736.7	3473.4	5210.1	6946.7	8683.4
41	.942	.88	.82	.77	.71	.65	.59	.53	.47	6.5	3.0	09.5	5.9	2.5
42	.938	.88	.81	.75	.69	.63	.57	.51	.44	6.3	2.6	8.9	5.2	1.5
43	.935	.87	.81	.74	.68	.61	.54	.48	.42	6.1	2.3	8.4	4.4	80.6
44	.932	.87	.80	.73	.66	.59	.52	.46	.39	5.9	1.9	7.8	3.7	79.6
20 45	28.929	57.86	86.79	115.71	144.65	173.57	202.50	231.43	260.36	1735.7	3471.5	5207.2	6942.9	8678.7
46	.926	.85	.78	.70	.63	.55	.48	.40	.33	5.5	1.1	6.6	2.1	7.7
47	.923	.85	.77	.69	.62	.54	.46	.38	.30	5.4	0.7	6.1	1.4	6.8
48	.919	.84	.76	.68	.60	.52	.43	.35	.28	5.2	0.4	5.5	40.6	5.8
49	.916	.84	.75	.66	.59	.50	.41	.33	.25	5.0	70.0	5.0	39.9	4.9
20 50	28.913	57.83	86.74	115.65	144.57	173.48	202.39	231.30	260.22	1734.8	3469.6	5204.4	6939.1	8673.9
51	.910	.82	.73	.64	.55	.46	.37	.28	.19	4.6	9.2	3.8	8.3	2.9
52	.907	.82	.72	.62	.54	.44	.35	.25	.16	4.4	8.8	3.2	7.6	2.0
53	.903	.81	.71	.61	.52	.42	.32	.23	.13	4.2	8.5	2.7	6.8	1.0
54	.900	.80	.70	.60	.51	.40	.30	.20	.10	4.0	8.1	2.1	6.1	70.1
20 55	28.897	57.79	86.69	115.58	144.49	173.38	202.28	231.18	260.07	1733.8	3467.7	5201.5	6935.3	8669.1
56	.894	.79	.68	.57	.47	.36	.26	.15	.05	3.6	7.3	0.9	4.5	8.1
57	.891	.78	.67	.56	.46	.34	.24	.13	60.02	3.4	6.9	200.3	3.8	7.2
58	.887	.77	.66	.55	.44	.33	.21	.10	59.99	3.3	6.5	199.8	3.1	6.2
59	.884	.77	.65	.53	.43	.31	.19	.08	.96	3.1	6.1	9.2	2.3	5.3
20 60	28.881	57.76	86.64	115.52	144.41	173.29	202.17	231.05	259.93	1732.9	3465.7	5198.6	6931.5	8664.3

Lat.		Latitude 20° to 21°—Meridional arcs.						Latitude 20°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 20° 30′		Value of 1′	Continuous sums of minutes from latitude 20° 00′		Longitude.	X	Y
°	′	Meters.	″	Meters.	Meters.	′	Meters.	° ′	Meters.	Meters.
20	00	30.750			1844.98					
	1	0	1	30.75	.98	1	1 845.0	0 1	1 744.1	0.1
	2	0	2	61.50	.98	2	3 690.0	2	3 488.3	0.3
	3	0	3	92.25	.99	3	5 534.9	3	5 232.4	0.8
	4	0	4	123.01	.99	4	7 379.9	4	6 976.6	1.4
20	05	30.750	5	153.76	1844.99	5	9 224.9	0 5	8 720.7	2.2
	6	0	6	184.51	5.00	6	11 069.9	6	10 464.9	3.1
	7	0	7	215.26	.00	7	12 914.9	7	12 209.0	4.3
	8	0	8	246.01	.00	8	14 759.9	8	13 953.1	5.6
	9	0	9	276.76	.01	9	16 604.9	9	15 697.3	7.0
20	10	30.750	10	307.51	1845.01	10	18 450.0	0 10	17 441.4	8.7
	11	0	1	338.27	.01	1	20 295.0	15	26 162.1	19.5
	12	0	2	369.02	.02	2	22 140.0	20	34 882.8	34.7
	13	0	3	399.77	.02	3	23 985.0	25	43 603.5	54.2
	14	0	4	430.52	.02	4	25 830.0	30	52 324.2	78.1
20	15	30.750	15	461.27	1845.03	15	27 675.1	0 35	61 044.9	106.3
	16	1	6	492.02	.03	9	29 520.1	40	69 765.6	138.8
	17	1	7	522.77	.04	7	31 365.1	45	78 486.2	175.7
	18	1	8	553.53	.04	8	33 210.2	50	87 206.9	216.9
	19	1	9	584.28	.04	9	35 055.2	55	95 927.5	262.5
20	20	30.751	20	615.03	1845.05	20	36 900.3	1 00	104 648.0	312.3
	21	1	1	645.78	.05	1	38 745.3	05	113 368.6	366.6
	22	1	2	676.53	.05	2	40 590.4	10	122 089.1	425.1
	23	1	3	707.28	.06	3	42 435.4	15	130 809.6	488.0
	24	1	4	738.03	.06	4	44 280.5	20	139 530.1	555.3
20	25	30.751	25	768.79	1845.06	25	46 125.5	1 25	148 250.5	626.8
	26	1	6	799.54	.07	6	47 970.6	30	156 970.9	702.8
	27	1	7	830.29	.07	7	49 815.7	35	165 691.3	783.0
	28	1	8	861.04	.07	8	51 660.8	40	174 411.6	867.6
	29	1	9	891.79	.08	9	53 505.8	45	183 131.8	956.5
20	30	30.751	30	922.54	1845.08	30	55 350.9	1 50	191 852.1	1 049.8
	31	1	1	953.29	.09	1	57 196.0	55	200 572.3	1 147.4
	32	1	2	984.04	.09	2	59 041.1	2 00	209 292	1 249
	33	2	3	1 014.80	.09	3	60 886.2	3 00	313 929	2 811
	34	2	4	1 045.55	.10	4	62 731.3	4 00	418 555	4 997
20	35	30.752	35	1 076.30	1845.10	35	64 576.4	5 00	523 166	7 808
	36	2	6	1 107.05	.10	6	66 421.5	6 00	627 758	11 243
	37	2	7	1 137.80	.11	7	68 266.6	7 00	732 328	15 302
	38	2	8	1 168.55	.11	8	70 111.7	8 00	836 871	19 986
	39	2	9	1 199.30	.11	9	71 956.8	9 00	941 385	25 294
20	40	30.752	40	1 230.06	1845.12	40	73 801.9	10 00	1 045 865	31 225
	41	2	1	1 260.81	.12	1	75 647.1	11 00	1 150 308	37 780
	42	2	2	1 291.56	.12	2	77 492.2	12 00	1 254 710	44 958
	43	2	3	1 322.31	.13	3	79 337.3	13 00	1 359 067	52 760
	44	2	4	1 353.06	.13	4	81 182.4	14 00	1 463 376	61 184
20	45	30.752	45	1 383.81	1845.14	45	83 027.6	15 00	1 567 633	70 230
	46	2	6	1 414.56	.14	6	84 872.7	16 00	1 671 834	79 899
	47	2	7	1 445.32	.14	7	86 717.9	17 00	1 775 975	90 190
	48	2	8	1 476.07	.15	8	88 563.0	18 00	1 880 054	101 102
	49	2	9	1 506.82	.15	9	90 408.2	19 00	1 984 064	112 635
20	50	30.753	50	1 537.57	1845.15	50	92 253.3	20 00	2 088 005	124 789
	51	3	1	1 568.32	.16	1	94 098.5	21 00	2 191 871	137 563
	52	3	2	1 599.07	.16	2	95 943.6	22 00	2 295 659	150 957
	53	3	3	1 629.82	.16	3	97 788.8	23 00	2 399 364	164 970
	54	3	4	1 660.58	.17	4	99 634.0	24 00	2 502 985	179 602
20	55	30.753	55	1 691.33	1845.17	55	101 479.1	25 00	2 606 516	194 853
	56	3	6	1 722.08	.18	6	103 324.3	26 00	2 709 955	210 721
	57	3	7	1 752.83	.18	7	105 169.5	27 00	2 813 297	227 206
	58	3	8	1 783.58	.18	8	107 014.7	28 00	2 916 538	244 308
	59	3	9	1 814.33	.19	9	108 859.9	29 00	3 019 676	262 026
20	60	30.753	60	1 845.08	1845.19	60	110 705.1	30 00	3 122 706	280 359

Latitude 21° to 22°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
21 00	28.881	57.76	86.64	115.52	144.41	173.29	202.17	231.05	259.93	1732.9	3465.7	5198.6	6931.5	8664.3
1	.878	.75	.63	.51	.39	.27	.15	.02	.90	2.7	5.3	8.0	30.7	3.3
2	.875	.75	.62	.50	.38	.25	.12	1.00	.87	2.5	4.9	7.4	29.9	2.4
3	.871	.74	.61	.48	.36	.23	.10	0.97	.84	2.3	4.6	6.9	9.2	1.4
4	.868	.74	.60	.47	.34	.21	.08	.95	.81	2.1	4.2	6.3	8.4	60.5
21 05	28.865	57.73	86.59	115.46	144.32	173.19	202.05	230.92	259.79	1731.9	3463.8	5195.7	6927.6	8659.5
6	.862	.72	.59	.45	.31	.17	.03	.89	.76	1.7	3.4	5.1	6.8	8.5
7	.859	.72	.58	.44	.29	.15	2.01	.87	.73	1.5	3.0	4.5	6.0	7.6
8	.855	.71	.57	.42	.27	.13	1.99	.84	.70	1.3	2.7	4.0	5.3	6.6
9	.852	.71	.56	.41	.26	.11	.96	.82	.67	1.1	2.3	3.4	4.5	5.7
21 10	28.849	57.70	86.55	115.40	144.24	173.09	201.94	230.79	259.64	1730.9	3461.9	5192.8	6923.7	8654.7
11	.846	.69	.54	.39	.22	.07	.92	.76	.61	0.7	1.5	2.2	2.9	3.7
12	.842	.69	.53	.37	.21	.05	.90	.74	.58	0.5	1.1	1.6	2.1	2.7
13	.839	.68	.52	.36	.19	.04	.87	.71	.55	0.4	0.7	1.1	1.4	1.8
14	.836	.67	.51	.35	.18	.02	.85	.69	.52	0.2	60.3	90.5	20.6	50.8
21 15	28.833	57.66	86.50	115.34	144.16	173.00	201.83	230.66	259.50	1730.0	3459.8	5189.9	6919.8	8649.8
16	.829	.66	.49	.32	.14	2.98	.81	.63	.47	29.8	9.4	9.3	9.0	8.8
17	.826	.65	.48	.31	.13	.96	.79	.61	.44	9.6	9.1	8.7	8.3	7.9
18	.823	.64	.47	.30	.11	.94	.76	.58	.41	9.4	8.7	8.2	7.5	6.9
19	.820	.64	.46	.28	.10	.92	.74	.56	.38	9.2	8.4	7.6	6.8	6.0
21 20	28.817	57.63	86.45	115.27	144.08	172.90	201.72	230.53	259.35	1729.0	3458.0	5187.0	6916.0	8645.0
21	.813	.62	.44	.26	.06	.88	.70	.50	.32	8.8	7.6	6.4	5.2	4.0
22	.810	.62	.43	.24	.05	.86	.67	.48	.29	8.6	7.2	5.8	4.4	3.0
23	.807	.61	.42	.23	.03	.84	.65	.45	.26	8.4	6.8	5.2	3.6	2.1
24	.804	.61	.41	.22	.02	.82	.63	.43	.23	8.2	6.4	4.6	2.8	1.1
21 25	28.800	57.60	86.40	115.21	144.00	172.80	201.60	230.40	259.21	1728.0	3456.0	5184.0	6912.0	8640.1
26	.797	.59	.39	.19	3.98	.78	.58	.37	.18	7.8	5.6	3.4	1.2	39.1
27	.794	.59	.38	.18	.97	.76	.56	.35	.15	7.6	5.2	2.8	10.4	8.1
28	.791	.58	.37	.17	.95	.74	.54	.32	.12	7.4	4.9	2.3	09.7	7.2
29	.787	.58	.36	.15	.94	.72	.51	.30	.09	7.2	4.5	1.7	8.9	6.2
21 30	28.784	57.57	86.35	115.14	143.92	172.70	201.49	230.27	259.06	1727.0	3454.1	5181.1	6908.1	8635.2
31	.781	.56	.34	.13	.90	.68	.47	.24	.03	6.8	3.7	80.5	7.3	4.2
32	.777	.56	.33	.11	.89	.66	.44	.22	9.00	6.6	3.3	79.9	6.5	3.2
33	.774	.55	.32	.10	.87	.64	.42	.19	8.97	6.4	2.9	9.3	5.8	2.2
34	.771	.54	.31	.08	.85	.62	.40	.17	.94	6.2	2.5	8.7	5.0	1.2
21 35	28.767	57.53	86.30	115.07	143.83	172.60	201.37	230.14	258.91	1726.0	3452.1	5178.1	6904.2	8630.2
36	.764	.53	.29	.06	.82	.58	.35	.11	.88	5.8	1.7	7.5	3.4	29.2
37	.761	.52	.28	.04	.80	.56	.33	.09	.85	5.6	1.3	6.9	2.6	8.2
38	.758	.51	.27	.03	.78	.55	.31	.06	.82	5.5	0.9	6.4	1.8	7.3
39	.754	.51	.26	.01	.77	.53	.28	.04	.79	5.3	0.5	5.8	1.0	6.3
21 40	28.751	57.50	86.25	115.00	143.75	172.51	201.26	230.01	258.76	1725.1	3450.1	5175.2	6900.2	8625.3
41	.748	.49	.24	4.99	.73	.49	.24	29.98	.73	4.9	49.7	4.6	899.4	4.3
42	.744	.49	.23	.97	.71	.47	.21	.96	.70	4.7	9.3	4.0	8.6	3.3
43	.741	.48	.22	.96	.69	.45	.19	.93	.67	4.5	8.9	3.4	7.8	2.3
44	.738	.48	.21	.95	.67	.43	.16	.90	.64	4.3	8.5	2.8	7.0	1.3
21 45	28.734	57.47	86.20	114.94	143.66	172.41	201.14	229.87	258.61	1724.1	3448.1	5172.2	6896.2	8620.3
46	.731	.46	.19	.92	.65	.39	.12	.85	.58	3.9	7.7	1.6	5.4	19.3
47	.728	.46	.18	.91	.64	.37	.09	.83	.55	3.7	7.3	1.0	4.6	8.3
48	.724	.45	.17	.90	.62	.35	.07	.79	.52	3.5	6.9	70.4	3.9	7.3
49	.721	.45	.16	.88	.61	.33	.04	.77	.49	3.3	6.5	69.8	3.1	6.3
21 50	28.718	57.44	86.15	114.87	143.59	172.31	201.02	229.74	258.46	1723.1	3446.1	5169.2	6892.3	8615.3
51	.714	.43	.14	.86	.57	.29	1.00	.71	.43	2.9	5.7	8.6	1.5	4.3
52	.711	.43	.13	.84	.56	.27	0.97	.69	.40	2.7	5.3	8.0	90.7	3.3
53	.708	.42	.12	.83	.54	.25	.95	.66	.37	2.5	4.9	7.4	89.9	2.3
54	.704	.41	.11	.82	.52	.23	.93	.64	.34	2.3	4.5	6.8	9.1	1.3
21 55	28.701	57.40	86.10	114.80	143.50	172.21	200.90	229.61	258.31	1722.1	3444.1	5166.2	6888.3	8610.3
56	.698	.40	.09	.79	.49	.19	.88	.58	.28	1.9	3.7	5.6	7.5	09.3
57	.694	.39	.08	.78	.47	.17	.86	.56	.25	1.7	3.3	5.0	6.7	8.3
58	.691	.38	.07	.77	.45	.15	.84	.53	.22	1.5	2.9	4.4	5.9	7.3
59	.688	.38	.06	.75	.44	.13	.81	.51	.19	1.3	2.5	3.8	5.1	6.3
21 60	28.684	57.37	86.05	114.74	143.42	172.11	200.79	229.48	258.16	1721.1	3442.1	5163.2	6884.3	8605.3

Lat.		Latitude 21° to 22°—Meridional arcs.						Latitude 21°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 21° 30′		Value of 1′	Continuous sums of minutes from latitude 21° 00′		Longitude.	X	Y
°	′	Meters.	″	Meters.	Meters.	′	Meters.	° ′	Meters.	Meters.
21	00	30.753			1845.19					
	1	3	1	30.76	.20	1	1 845.2	0 1	1 732.9	0.1
	2	3	2	61.51	.20	2	3 690.4	2	3 465.7	0.4
	3	3	3	92.27	.20	3	5 535.6	3	5 198.6	0.8
	4	3	4	123.02	.21	4	7 380.8	4	6 931.5	1.4
21	05	30.753	5	153.78	1845.21	5	9 226.0	0 5	8 664.3	2.2
	6	4	6	184.53	.21	6	11 071.2	6	10 397.2	3.2
	7	4	7	215.29	.22	7	12 916.4	7	12 130.0	4.4
	8	4	8	246.04	.22	8	14 761.7	8	13 862.9	5.8
	9	4	9	276.80	.23	9	16 606.9	9	15 595.8	7.3
21	10	30.754	10	307.55	1845.23	10	18 452.1	0 10	17 328.6	9.0
	11	4	1	338.31	.23	1	20 297.3	15	25 993.0	20.3
	12	4	2	369.06	.24	2	22 142.6	20	34 657.3	36.1
	13	4	3	399.82	.24	3	23 987.8	25	43 321.6	56.4
	14	4	4	430.57	.24	4	25 833.1	30	51 985.9	81.3
21	15	30.754	15	461.33	1845.25	15	27 678.3	0 35	60 650.2	110.7
	16	4	6	492.08	.25	6	29 523.6	40	69 314.5	144.5
	17	4	7	522.84	.25	7	31 368.8	45	77 978.7	182.9
	18	4	8	553.59	.26	8	33 214.1	50	86 643.0	225.8
	19	4	9	584.35	.26	9	35 059.3	55	95 307.2	273.2
21	20	30.754	20	615.10	1845.27	20	36 904.6	1 00	103 971.3	325.2
	21	4	1	645.86	.27	1	38 749.9	05	112 635.5	381.6
	22	5	2	676.61	.27	2	40 595.1	10	121 299.6	442.5
	23	5	3	707.37	.28	3	42 440.4	15	129 963.7	508.0
	24	5	4	738.12	.28	4	44 285.7	20	138 627.7	578.0
21	25	30.755	25	768.88	1845.28	25	46 131.0	1 25	147 291.8	652.5
	26	5	6	799.63	.29	6	47 976.3	30	155 955.7	731.6
	27	5	7	830.39	.29	7	49 821.5	35	164 619.7	815.1
	28	5	8	861.14	.30	8	51 666.8	40	173 283.6	903.2
	29	5	9	891.90	.30	9	53 512.1	45	181 947.4	995.8
21	30	30.755	30	922.65	1845.30	30	55 357.4	1 50	190 611.2	1 092.9
	31	5	1	953.41	.31	1	57 202.7	55	199 274.9	1 194.5
	32	5	2	984.16	.31	2	59 048.0	2 00	207 939	1 301
	33	5	3	1 014.92	.31	3	60 893.4	3 00	311 898	2 926
	34	5	4	1 045.67	.32	4	62 738.7	4 00	415 845	5 202
21	35	30.755	35	1 076.43	1845.32	35	64 584.0	5 00	519 775	8 128
	36	5	6	1 107.18	.33	6	66 429.3	6 00	623 686	11 704
	37	5	7	1 137.94	.33	7	68 274.6	7 00	727 572	15 930
	38	6	8	1 168.69	.33	8	70 120.0	8 00	831 429	20 806
	39	6	9	1 199.45	.34	9	71 965.3	9 00	935 254	26 331
21	40	30.756	40	1 230.20	1845.34	40	73 810.6	10 00	1 039 042	32 505
	41	6	1	1 260.96	.34	1	75 656.0	11 00	1 142 790	39 328
	42	6	2	1 291.71	.35	2	77 501.3	12 00	1 246 493	46 801
	43	6	3	1 322.47	.35	3	79 346.7	13 00	1 350 147	54 922
	44	6	4	1 353.22	.36	4	81 192.0	14 00	1 453 749	63 690
21	45	30.756	45	1 383.98	1845.36	45	83 037.4	15 00	1 557 294	73 107
	46	6	6	1 414.73	.36	6	84 882.8	16 00	1 660 777	83 171
	47	6	7	1 445.49	.37	7	86 728.1	17 00	1 764 195	93 882
	48	6	8	1 476.24	.37	8	88 573.5	18 00	1 867 545	105 240
	49	6	9	1 507.00	.37	9	90 418.9	19 00	1 970 822	117 244
21	50	30.756	50	1 537.75	1845.38	50	92 264.2	20 00	2 074 021	129 893
	51	6	1	1 568.51	.38	1	94 109.6	21 00	2 177 139	143 188
	52	6	2	1 599.26	.39	2	95 955.0	22 00	2 280 173	157 128
	53	6	3	1 630.02	.39	3	97 800.4	23 00	2 383 117	171 712
	54	7	4	1 660.77	.39	4	99 645.8	24 00	2 485 967	186 939
21	55	30.757	55	1 691.53	1845.40	55	101 491.2	25 00	2 588 720	202 809
	56	7	6	1 722.28	.40	6	103 336.6	26 00	2 691 373	219 322
	57	7	7	1 753.04	.40	7	105 182.0	27 00	2 793 920	236 476
	58	7	8	1 783.79	.41	8	107 027.4	28 00	2 896 358	254 272
	59	7	9	1 814.55	.41	9	108 872.8	29 00	2 998 682	272 708
21	60	30.757	60	1 845.30	1845.42	60	110 718.2	30 00	3 100 889	291 784

Latitude 22° to 23°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
22 00	28.684	57.37	86.05	114.74	143.42	172.11	200.79	229.48	258.16	1721.1	3442.1	5163.2	6884.3	8605.3
1	.681	.36	.04	.73	.40	.09	.77	.45	.13	0.9	1.7	2.6	3.5	4.3
2	.678	.36	.03	.71	.39	.07	.74	.43	.10	0.7	1.3	2.0	2.7	3.3
3	.674	.35	.02	.70	.37	.05	.72	.40	.07	0.5	0.9	1.4	1.8	2.3
4	.671	.34	.01	.68	.35	.03	.69	.37	.04	0.3	0.5	0.8	1.0	1.3
22 05	28.668	57.33	86.00	114.67	143.33	172.01	200.67	229.35	258.01	1720.1	3440.1	5160.2	6880.2	8600.3
6	.664	.33	5.99	.66	.32	1.99	.65	.32	7.98	19.9	39.7	59.6	79.4	599.3
7	.661	.32	.98	.64	.30	.97	.62	.29	.95	9.7	9.3	9.0	8.6	8.3
8	.657	.31	.97	.63	.28	.94	.60	.26	.92	9.4	8.9	8.3	7.8	7.2
9	.654	.31	.96	.61	.27	.92	.57	.24	.89	9.2	8.5	7.7	7.0	6.2
22 10	28.651	57.30	85.95	114.60	143.25	171.90	200.55	229.21	257.86	1719.0	3438.1	5157.1	6876.2	8595.2
11	.647	.29	.94	.59	.23	.88	.53	.18	.83	8.8	7.7	6.5	5.4	4.2
12	.644	.29	.93	.57	.22	.86	.50	.16	.80	8.6	7.3	5.9	4.6	3.2
13	.641	.28	.92	.56	.20	.84	.48	.13	.77	8.4	6.9	5.3	3.7	2.2
14	.637	.27	.91	.55	.18	.82	.46	.10	.74	8.2	6.5	4.7	2.9	1.2
22 15	28.634	57.26	85.90	114.54	143.16	171.80	200.43	229.07	257.70	1718.0	3436.1	5154.1	6872.1	8590.1
16	.630	.26	.89	.52	.15	.78	.41	.05	.67	7.8	5.7	3.5	1.3	89.1
17	.627	.25	.88	.51	.13	.76	.39	9.02	.64	7.6	5.3	2.9	70.5	8.1
18	.624	.24	.87	.50	.11	.74	.37	8.99	.61	7.4	4.8	2.2	69.7	7.1
19	.620	.24	.86	.48	.10	.72	.34	.97	.58	7.2	4.4	1.6	8.9	6.1
22 20	28.617	57.23	85.85	114.47	143.08	171.70	200.32	228.94	257.55	1717.0	3434.0	5151.0	6868.1	8585.1
21	.613	.22	.84	.46	.06	.68	.30	.91	.52	6.8	3.6	50.4	7.3	4.0
22	.610	.22	.83	.44	.05	.66	.27	.88	.49	6.6	3.2	49.8	6.5	3.0
23	.607	.21	.82	.43	.03	.64	.25	.86	.46	6.4	2.8	9.2	5.6	2.0
24	.603	.21	.81	.41	.01	.62	.22	.83	.43	6.2	2.4	8.6	4.8	81.0
22 25	28.600	57.20	85.80	114.40	143.00	171.60	200.20	228.80	257.40	1716.0	3432.0	5148.0	6864.0	8579.9
26	.596	.19	.79	.39	2.98	.58	.18	.77	.37	5.8	1.6	7.4	3.2	8.9
27	.593	.19	.78	.37	.96	.56	.15	.74	.34	5.6	1.2	6.8	2.4	7.9
28	.590	.18	.77	.36	.94	.54	.13	.72	.31	5.4	0.7	6.1	1.5	6.9
29	.586	.18	.76	.34	.93	.52	.10	.69	.28	5.2	30.3	5.5	60.7	5.9
22 30	28.583	57.17	85.75	114.33	142.91	171.50	200.08	228.66	257.25	1715.0	3429.9	5144.9	6859.9	8574.8
31	.579	.16	.74	.32	.89	.48	.06	.63	.22	4.8	9.5	4.3	9.1	3.8
32	.576	.16	.73	.30	.88	.46	.03	.60	.19	4.6	9.1	3.7	8.3	2.7
33	.572	.15	.72	.29	.86	.43	200.01	.58	.16	4.3	8.7	3.0	7.4	1.7
34	.569	.14	.71	.27	.84	.41	199.98	.55	.13	4.1	8.3	2.4	6.6	70.7
22 35	28.566	57.13	85.70	114.26	142.82	171.39	199.96	228.52	257.09	1713.9	3427.9	5141.8	6855.8	8569.7
36	.562	.13	.69	.25	.81	.37	.94	.49	.06	3.7	7.5	1.2	5.0	8.6
37	.559	.12	.68	.23	.79	.35	.91	.46	.03	3.5	7.1	40.6	4.1	7.6
38	.555	.11	.67	.22	.77	.33	89	.44	7.00	3.3	6.6	39.9	3.3	6.6
39	.552	.11	.66	.20	.76	.31	.86	.41	6.97	3.1	6.2	9.3	2.4	5.6
22 40	28.548	57.10	85.65	114.19	142.74	171.29	199.84	228.38	256.94	1712.9	3425.8	5138.7	6851.6	8564.5
41	.545	.09	.64	.18	.72	.27	.82	.35	.91	2.7	5.4	8.1	0.8	3.5
42	.541	.09	.62	.16	.71	.25	.79	.33	.88	2.5	5.0	7.5	50.0	2.4
43	.538	.08	.61	.15	.69	.23	.77	.30	.84	2.3	4.5	6.8	49.1	1.4
44	.535	.07	.60	.14	.67	.21	.74	.27	.81	2.1	4.1	6.2	8.3	60.4
22 45	28.531	57.06	85.59	114.12	142.66	171.19	199.72	228.25	256.78	1711.9	3423.7	5135.6	6847.5	8559.3
46	.528	.06	.58	.11	.64	.17	.70	.22	.75	1.7	3.3	5.0	6.7	8.3
47	.524	.05	.57	.10	.62	.15	.67	.19	.72	1.5	2.9	4.4	5.8	7.3
48	.521	.04	.56	.09	.60	.12	.65	.16	.68	1.2	2.5	3.7	5.0	6.2
49	.517	.04	.55	.07	.59	.10	.62	.14	.65	1.0	2.1	3.1	4.1	5.2
22 50	28.514	57.03	85.54	114.06	142.57	171.08	199.60	228.11	256.62	1710.8	3421.7	5132.5	6843.3	8554.1
51	.510	.02	.53	.05	.55	.06	.58	.08	.59	0.6	1.3	1.9	2.5	3.1
52	.507	.02	.52	.03	.53	.04	.55	.05	.56	0.4	0.9	1.2	1.6	2.0
53	.503	.01	.51	.02	.52	.02	.53	.03	.53	0.2	0.4	30.6	40.8	1.0
54	.500	57.00	.50	4.00	.50	1.00	.50	8.00	.50	10.0	20.0	29.9	39.9	50.0
22 55	28.496	56.99	85.49	113.99	142.48	170.98	199.48	227.97	256.46	1709.8	3419.6	5129.3	6839.1	8548.9
56	.493	.99	.48	.98	.46	.96	.45	.94	.43	9.6	9.2	8.7	8.3	7.9
57	.489	.98	.47	.96	.44	.94	.43	.91	.40	9.4	8.8	8.1	7.4	6.8
58	.486	.97	.46	.95	.43	.92	.40	.89	.37	9.2	8.3	7.4	6.5	5.8
59	.482	.97	.45	.93	.41	.89	.38	.86	.34	8.9	7.9	6.8	5.7	4.7
22 60	28.479	56.96	85.44	113.92	142.39	170.87	199.35	227.83	256.31	1708.7	3417.5	5126.2	6834.9	8543.7

Lat.		Latitude 22° to 23°—Meridional arcs.						Latitude 22°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 22° 30′		Value of 1′	Continuous sums of minutes from latitude 22° 00′		Longitude.	X	Y
°	′	Meters.	″	Meters.	Meters.	′	Meters.	° ′	Meters.	Meters.
22	00	30.757			1845.42					
	1	7	1	30.76	.42	1	1 845.4	0 1	1 721.1	0.1
	2	7	2	61.52	.42	2	3 690.8	2	3 442.2	0.4
	3	7	3	92.28	.43	3	5 536.3	3	5 163.2	0.8
	4	7	4	123.04	.43	4	7 381.7	4	6 884.3	1.5
22	05	30.757	5	153.79	1845.44	5	9 227.1	0 5	8 605.4	2.3
	6	7	6	184.55	.44	6	11 072.6	6	10 326.5	3.4
	7	7	7	215.31	.44	7	12 918.0	7	12 047.5	4.6
	8	7	8	246.07	.45	8	14 763.4	8	13 768.6	6.0
	9	7	9	276.83	.45	9	16 608.9	9	15 489.7	7.6
22	10	30.758	10	307.59	1845.45	10	18 454.3	0 10	17 210.7	9.4
	11	8	1	338.35	.46	1	20 299.8	15	25 816.0	21.1
	12	8	2	369.11	.46	2	22 145.3	20	34 421.3	37.5
	13	8	3	399.86	.47	3	23 990.7	25	43 026.6	58.6
	14	8	4	430.62	.47	4	25 836.2	30	51 631.8	84.4
22	15	30.758	15	461.38	1845.47	15	27 681.7	0 35	60 237.1	114.9
	16	8	6	492.14	.48	6	29 527.1	40	68 842.3	150.0
	17	8	7	522.90	.48	7	31 372.6	45	77 447.6	189.9
	18	8	8	553.66	.48	8	33 218.1	50	86 052.8	234.4
	19	8	9	584.42	.49	9	35 063.6	55	94 657.9	283.7
22	20	30.758	20	615.18	1845.49	20	36 909.1	1 00	103 263.1	337.6
	21	8	1	645.94	.50	1	38 754.6	05	111 868.2	396.2
	22	8	2	676.69	.50	2	40 600.1	10	120 473.3	459.5
	23	8	3	707.45	.50	3	42 445.6	15	129 078.3	527.5
	24	8	4	738.21	.51	4	44 291.1	20	137 683.3	600.1
22	25	30.759	25	768.97	1845.51	25	46 136.6	1 25	146 288.3	677.5
	26	9	6	799.73	.52	6	47 982.1	30	154 893.2	759.5
	27	9	7	830.49	.52	7	49 827.6	35	163 498.1	846.3
	28	9	8	861.25	.52	8	51 673.1	40	172 102.9	937.7
	29	9	9	892.01	.53	9	53 518.7	45	180 707.7	1 033.8
22	30	30.759	30	922.77	1845.53	30	55 364.2	1 50	189 312.4	1 134.6
	31	9	1	953.52	.53	1	57 209.7	55	197 917.1	1 240.1
	32	9	2	984.28	.54	2	59 055.3	2 00	206 522	1 350
	33	9	3	1 015.04	.54	3	60 900.8	3 00	309 772	3 037
	34	9	4	1 045.80	.55	4	62 746.3	4 00	413 008	5 400
22	35	30.759	35	1 076.56	1845.55	35	64 591.9	5 00	516 227	8 438
	36	9	6	1 107.32	.55	6	66 437.4	6 00	619 424	12 151
	37	9	7	1 138.08	.56	7	68 283.0	7 00	722 595	16 538
	38	9	8	1 168.84	.56	8	70 128.6	8 00	825 734	21 600
	39	9	9	1 199.59	.57	9	71 974.1	9 00	928 838	27 336
22	40	30.759	40	1 230.35	1845.57	40	73 819.7	10 00	1 031 903	33 746
	41	60	1	1 261.11	.57	1	75 665.3	11 00	1 134 923	40 829
	42	0	2	1 291.87	.58	2	77 510.8	12 00	1 237 895	48 586
	43	0	3	1 322.63	.58	3	79 356.4	13 00	1 340 814	57 016
	44	0	4	1 353.39	.58	4	81 202.0	14 00	1 443 675	66 119
22	45	30.760	45	1 384.15	1845.59	45	83 047.6	15 00	1 546 475	75 894
	46	0	6	1 414.91	.59	6	84 893.2	16 00	1 649 209	86 341
	47	0	7	1 445.67	.60	7	86 738.8	17 00	1 751 873	97 459
	48	0	8	1 476.42	.60	8	88 584.4	18 00	1 854 461	109 248
	49	0	9	1 507.18	.60	9	90 430.0	19 00	1 956 970	121 708
22	50	30.760	50	1 537.94	1845.61	50	92 275.6	20 00	2 059 396	134 838
	51	0	1	1 568.70	.61	1	94 121.2	21 00	2 161 733	148 637
	52	0	2	1 599.46	.62	2	95 966.8	22 00	2 263 978	163 105
	53	0	3	1 630.22	.62	3	97 812.4	23 00	2 366 126	178 241
	54	0	4	1 660.98	.62	4	99 658.0	24 00	2 468 174	194 045
22	55	30.760	55	1 691.74	1845.63	55	101 503.7	25 00	2 570 116	210 515
	56	1	6	1 722.50	.63	6	103 349.3	26 00	2 671 947	227 652
	57	1	7	1 753.25	.64	7	105 194.9	27 00	2 773 664	245 454
	58	1	8	1 784.01	.64	8	107 040.6	28 00	2 875 264	263 921
	59	1	9	1 814.77	.64	9	108 886.2	29 00	2 976 740	283 051
22	60	30.761	60	1 845.53	1845.65	60	110 731.8	30 00	3 078 089	302 845

Latitude 23° to 24°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
23 00	28.479	56.96	85.44	113.92	142.39	170.87	199.35	227.83	256.31	1708.7	3417.5	5126.2	6834.9	8543.7
1	.475	.95	.43	.91	.37	.85	.33	.80	.28	8.5	7.1	5.6	4.1	2.6
2	.472	.95	.42	.89	.36	.83	.30	.77	.25	8.3	6.7	5.0	3.2	1.6
3	.468	.94	.41	.88	.34	.81	.28	.75	.22	8.1	6.2	4.3	2.4	40.5
4	.465	.93	.40	.86	.32	.79	.25	.72	.19	7.9	5.8	3.7	1.5	39.5
23 05	28.461	56.92	85.38	113.85	142.31	170.77	199.23	227.69	256.15	1707.7	3415.4	5123.1	6830.7	8538.4
6	.458	.92	.37	.84	.29	.75	.21	.66	.12	7.5	5.0	2.5	29.9	7.4
7	.454	.91	.36	.82	.27	.73	.18	.63	.09	7.3	4.6	1.8	9.0	6.3
8	.451	.90	.35	.81	.25	.71	.16	.61	.06	7.1	4.1	1.2	8.2	5.3
9	.447	.90	.34	.79	.24	.68	.13	.58	.03	6.8	3.7	20.5	7.3	4.2
23 10	28.444	56.89	85.33	113.78	142.22	170.66	199.11	227.55	256.00	1706.6	3413.3	5119.9	6826.5	8533.2
11	.440	.88	.32	.77	.20	.64	.09	.52	5.97	6.4	2.9	9.3	5.7	2.1
12	.437	.88	.31	.75	.18	.62	.06	.49	.94	6.2	2.5	8.6	4.8	1.1
13	.433	.87	.30	.74	.17	.60	.04	.47	.90	6.0	2.0	8.0	4.0	30.0
14	.430	.86	.29	.72	.15	.58	9.01	.44	.87	5.8	1.6	7.3	3.1	28.9
23 15	28.426	56.85	85.28	113.71	142.13	170.56	198.99	227.41	255.84	1705.6	3411.2	5116.7	6822.3	8527.9
16	.423	.85	.27	.69	.11	.54	.96	.38	.81	5.4	0.8	6.1	1.5	6.8
17	.419	.84	.26	.68	.09	.52	.94	.35	.78	5.2	10.3	5.4	20.6	5.8
18	.416	.83	.25	.66	.08	.49	.91	.33	.74	4.9	09.9	4.8	19.8	4.7
19	.412	.83	.24	.65	.06	.47	.89	.30	.71	4.7	9.4	4.1	8.9	3.6
23 20	28.409	56.82	85.23	113.63	142.04	170.45	198.86	227.27	255.68	1704.5	3409.0	5113.5	6818.1	8522.6
21	.405	.81	.22	.62	.02	.43	.84	.24	.65	4.3	8.6	2.9	7.2	1.5
22	.401	.81	.20	.60	2.01	.41	.81	.21	.62	4.1	8.2	2.2	6.4	20.4
23	.398	.80	.19	.59	1.99	.39	.79	.18	.58	3.9	7.7	1.6	5.5	19.4
24	.394	.79	.18	.57	.97	.37	.76	.15	.55	3.7	7.3	0.9	4.7	8.3
23 25	28.391	56.78	85.17	113.56	141.96	170.34	198.74	227.13	255.52	1703.4	3406.9	5110.3	6813.8	8517.2
26	.387	.78	.16	.55	.94	.32	.71	.10	.49	3.2	6.5	09.7	2.9	6.2
27	.384	.77	.15	.53	.92	.30	.69	.07	.46	3.0	6.1	9.0	2.1	5.1
28	.380	.76	.14	.52	.90	.28	.66	.04	.42	2.8	5.6	8.4	1.2	4.0
29	.377	.76	.13	.50	.89	.26	.64	7.01	.39	2.6	5.2	7.7	10.4	3.0
23 30	28.373	56.75	85.12	113.49	141.87	170.24	198.61	226.98	255.36	1702.4	3404.8	5107.1	6809.5	8511.9
31	.369	.74	.11	.48	.85	.22	.59	.95	.33	2.2	4.4	6.5	8.6	10.8
32	.366	.73	.10	.46	.83	.20	.56	.92	.29	2.0	3.9	5.8	7.8	09.8
33	.362	.73	.09	.45	.82	.17	.54	.90	.26	1.7	3.5	5.2	6.9	8.7
34	.359	.72	.08	.43	.80	.15	.51	.87	.23	1.5	3.0	4.5	6.1	7.6
23 35	28.355	56.71	85.06	113.42	141.78	170.13	198.49	226.84	255.19	1701.3	3402.6	5103.9	6805.2	8506.5
36	.352	.70	.05	.41	.76	.11	.46	.81	.16	1.1	2.2	3.3	4.3	5.5
37	.348	.69	.04	.39	.74	.09	.44	.78	.13	0.9	1.8	2.6	3.5	4.4
38	.344	.69	.03	.38	.73	.06	.41	.76	.10	0.6	1.3	2.0	2.6	3.3
39	.341	.68	.02	.36	.71	.04	.39	.73	.06	0.4	0.9	1.3	1.8	2.2
23 40	28.337	56.67	85.01	113.35	141.69	170.02	198.36	226.70	255.03	1700.2	3400.5	5100.7	6800.9	8501.2
41	.334	.66	5.00	.34	.67	70.00	.34	.67	5.00	700.0	400.1	100.0	800.0	500.1
42	.330	.66	4.99	.32	.65	69.98	.31	.64	4.97	699.8	399.6	5099.4	799.2	499.0
43	.326	.65	.98	.31	.64	.96	.29	.61	.93	9.6	9.2	8.7	8.3	7.9
44	.323	.64	.97	.29	.62	.94	.26	.58	.90	9.4	8.7	8.1	7.5	6.8
23 45	28.319	56.63	84.96	113.28	141.60	169.92	198.24	226.56	254.87	1699.2	3398.3	5097.4	6796.6	8495.8
46	.316	.63	.95	.26	.58	.89	.21	.53	.84	8.9	7.9	6.8	5.7	4.7
47	.312	.62	.94	.25	.56	.87	.19	.50	.81	8.7	7.4	6.1	4.9	3.6
48	.308	.61	.93	.23	.55	.85	.16	.47	.77	8.5	7.0	5.5	4.0	2.5
49	.305	.61	.91	.22	.53	.83	.14	.44	.74	8.3	6.5	4.8	3.2	1.4
23 50	28.301	56.60	84.90	113.20	141.51	169.81	198.11	226.41	254.71	1698.1	3396.1	5094.2	6792.3	8490.4
51	.298	.59	.89	.19	.49	.79	.08	.38	.68	7.9	5.7	3.5	1.4	89.3
52	.294	.59	.88	.17	.47	.77	.06	.35	.64	7.7	5.3	2.9	90.5	8.2
53	.290	.58	.87	.16	.45	.74	.03	.32	.61	7.4	4.8	2.2	89.7	7.1
54	.287	.57	.86	.14	.43	.72	8.01	.29	.58	7.2	4.4	1.6	8.8	6.0
23 55	28.283	56.56	84.85	113.13	141.42	169.70	197.98	226.27	254.54	1697.0	3394.0	5090.9	6787.9	8484.9
56	.279	.56	.84	.12	.40	.68	.95	.24	.51	6.8	3.6	90.3	7.0	3.8
57	.276	.55	.83	.10	.38	.66	.93	.21	.48	6.6	3.1	89.6	6.2	2.7
58	.272	.54	.82	.09	.36	.63	.90	.18	.45	6.3	2.7	9.0	5.3	1.6
59	.268	.54	.80	.07	.34	.61	.88	.15	.41	6.1	2.2	8.3	4.5	80.5
23 60	28.265	56.53	84.79	113.06	141.32	169.59	197.85	226.12	254.38	1695.9	3391.8	5087.7	6783.6	8479.5

Lat.		Latitude 23° to 24°—Meridional arcs.						Latitude 23°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 23° 30′		Value of 1′	Continuous sums of minutes from latitude 23° 00′		Longitude.	X	Y
°	′	*Meters.*	″	*Meters.*	*Meters.*	′	*Meters.*	° ′	*Meters.*	*Meters.*
23	00	30.761			1845.65					
	1	1	1	30.76	.65	1	1 845.6	0 1	1 708.7	0.1
	2	1	2	61.53	.66	2	3 691.3	2	3 417.5	0.4
	3	1	3	92.29	.66	3	5 537.0	3	5 126.2	0.9
	4	1	4	123.05	.66	4	7 382.6	4	6 835.0	1.6
23	05	30.761	5	153.81	1845.67	5	9 228.3	0 5	8 543.7	2.4
	6	1	6	184.58	.67	6	11 073.9	6	10 252.4	3.5
	7	1	7	215.34	.67	7	12 919.6	7	11 961.2	4.8
	8	1	8	246.10	.68	8	14 765.3	8	13 669.9	6.2
	9	1	9	276.86	.68	9	16 611.0	9	15 378.6	7.9
23	10	30.761	10	307.63	1845.69	10	18 456.7	0 10	17 087.4	9.7
	11	2	1	338.39	.69	1	20 302.3	15	25 631.0	21.8
	12	2	2	369.15	.69	2	22 148.0	20	34 174.7	38.8
	13	2	3	399.92	.70	3	23 993.7	25	42 718.4	60.7
	14	2	4	430.68	.70	4	25 839.4	30	51 262.0	87.4
23	15	30.762	15	461.44	1845.71	15	27 685.1	0 35	59 805.7	118.9
	16	2	6	492.20	.71	6	29 530.8	40	68 349.3	155.4
	17	2	7	522.97	.71	7	31 376.6	45	76 892.8	196.6
	18	2	8	553.73	.72	8	33 222.3	50	85 436.4	242.8
	19	2	9	584.49	.72	9	35 068.0	55	93 979.9	293.7
23	20	30.762	20	615.26	1845.73	20	36 913.7	1 00	102 523.4	349.6
	21	2	1	646.02	.73	1	38 759.4	05	111 066.9	410.3
	22	2	2	676.78	.73	2	40 605.2	10	119 610.3	475.8
	23	2	3	707.54	.74	3	42 450.9	15	128 153.7	546.2
	24	2	4	738.31	.74	4	44 296.7	20	136 697.1	621.5
23	25	30.762	25	769.07	1845.75	25	46 142.4	1 25	145 240.4	701.6
	26	2	6	799.83	.75	6	47 988.1	30	153 783.6	786.6
	27	3	7	830.59	.75	7	49 833.9	35	162 326.8	876.4
	28	3	8	861.36	.76	8	51 679.7	40	170 870.0	971.1
	29	3	9	892.12	.76	9	53 525.4	45	179 413.1	1 070.6
23	30	30.763	30	922.88	1845.77	30	55 371.2	1 50	187 956.1	1 175.0
	31	3	1	953.65	.77	1	57 216.9	55	196 499.1	1 284.2
	32	3	2	984.41	.77	2	59 062.7	2 00	205 042	1 398
	33	3	3	1 015.17	.78	3	60 908.5	3 00	307 551	3 146
	34	3	4	1 045.93	.78	4	62 754.3	4 00	410 046	5 593
23	35	30.763	35	1 076.70	1845.79	35	64 600.1	5 00	512 522	8 739
	36	3	6	1 107.46	.79	6	66 445.8	6 00	614 974	12 583
	37	3	7	1 138.22	.79	7	68 291.6	7 00	717 397	17 126
	38	3	8	1 168.99	.80	8	70 137.4	8 00	819 787	22 368
	39	3	9	1 199.75	.80	9	71 983.2	9 00	922 139	28 307
23	40	30.763	40	1 230.51	1845.81	40	73 829.0	10 00	1 024 448	34 945
	41	3	1	1 261.27	.81	1	75 674.8	11 00	1 126 709	42 280
	42	4	2	1 292.04	.81	2	77 520.7	12 00	1 228 918	50 312
	43	4	3	1 322.80	.82	3	79 366.5	13 00	1 331 070	59 041
	44	4	4	1 353.56	.82	4	81 212.3	14 00	1 433 160	68 466
23	45	30.764	45	1 384.32	1845.83	45	83 058.1	15 00	1 535 183	78 588
	46	4	6	1 415.09	.83	6	84 903.9	16 00	1 637 135	89 405
	47	4	7	1 445.85	.83	7	86 749.8	17 00	1 739 011	100 917
	48	4	8	1 476.61	.84	8	88 595.6	18 00	1 840 805	113 123
	49	4	9	1 507.38	.84	9	90 441.5	19 00	1 942 514	126 023
23	50	30.764	50	1 538.14	1845.85	50	92 287.3	20 00	2 044 133	139 617
	51	4	1	1 568.90	.85	1	94 133.2	21 00	2 145 657	153 903
	52	4	2	1 599.66	.85	2	95 979.0	22 00	2 247 081	168 882
	53	4	3	1 630.43	.86	3	97 824.9	23 00	2 348 400	184 552
	54	4	4	1 661.19	.86	4	99 670.7	24 00	2 449 611	200 911
23	55	30.764	55	1 691.95	1845.87	55	101 516.6	25 00	2 550 707	217 960
	56	5	6	1 722.72	.87	6	103 362.4	26 00	2 651 685	235 700
	57	5	7	1 753.48	.87	7	105 208.3	27 00	2 752 540	254 127
	58	5	8	1 784.24	.88	8	107 054.2	28 00	2 853 266	273 242
	59	5	9	1 815.00	.88	9	108 900.1	29 00	2 953 859	293 043
23	60	30.765	60	1 845.77	1845.89	60	110 746.0	30 00	3 054 316	313 530

Latitude 24° to 25°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
24 00	28.265	56.53	84.79	113.06	141.32	169.59	197.85	226.12	254.38	1695.9	3391.8	5087.7	6783.6	8479.5
1	.261	.52	.78	.05	.30	.57	.83	.09	.35	5.7	1.4	7.0	2.7	8.4
2	.258	.52	.77	.03	.28	.55	.80	.06	.32	5.5	0.9	6.4	1.8	7.3
3	.254	.51	.76	.02	.27	.52	.78	.03	.28	5.2	0.5	5.7	1.0	6.2
4	.250	.50	.75	3.00	.25	.50	.75	6.00	.25	5.0	90.0	5.1	80.1	5.1
24 05	28.247	56.50	84.74	112.99	141.23	169.48	197.73	225.98	254.22	1694.8	3389.6	5084.4	6779.2	8474.0
6	.243	.49	.73	.97	.21	.46	.70	.95	.19	4.6	9.2	3.7	8.3	2.9
7	.239	.48	.72	.96	.19	.44	.68	.92	.16	4.4	8.7	3.1	7.4	1.8
8	.236	.47	.71	.94	.18	.41	.65	.89	.12	4.1	8.3	2.4	6.6	70.7
9	.232	.47	.70	.93	.16	.39	.63	.86	.09	3.9	7.8	1.8	5.7	69.6
24 10	28.228	56.46	84.69	112.91	141.14	169.37	197.60	225.83	254.06	1693.7	3387.4	5081.1	6774.8	8468.5
11	.225	.45	.67	.90	.12	.35	.57	.80	4.03	3.5	7.0	80.4	3.9	7.4
12	.221	.44	.66	.88	.10	.33	.55	.77	3.99	3.3	6.5	79.8	3.0	6.3
13	.217	.44	.65	.87	.09	.30	.52	.74	.96	3.0	6.1	9.1	2.2	5.2
14	.214	.43	.64	.85	.07	.28	.50	.71	.92	2.8	5.6	8.5	1.3	4.1
24 15	28.210	56.42	84.63	112.84	141.05	169.26	197.47	225.68	253.89	1692.6	3385.2	5077.8	6770.4	8463.0
16	.206	.41	.62	.83	.03	.24	.44	.65	.86	2.4	4.8	7.1	69.5	1.9
17	.203	.40	.61	.81	.01	.22	.42	.62	.82	2.2	4.3	6.5	8.6	60.8
18	.199	.40	.60	.80	1.00	.19	.39	.59	.79	1.9	3.9	5.8	7.8	59.7
19	.195	.39	.59	.78	0.98	.17	.37	.56	.75	1.7	3.4	5.2	6.9	8.6
24 20	28.192	56.38	84.57	112.77	140.96	169.15	197.34	225.53	253.72	1691.5	3383.0	5074.5	6766.0	8457.5
21	.188	.37	.56	.76	.94	.13	.31	.50	.69	1.3	2.6	3.7	5.1	6.4
22	.184	.37	.55	.74	.92	.11	.29	.47	.65	1.1	2.1	3.1	4.2	5.3
23	.180	.36	.54	.73	.90	.08	.26	.44	.62	0.8	1.7	2.5	3.3	4.1
24	.177	.35	.53	.71	.88	.06	.24	.41	.59	0.6	1.2	1.9	2.4	3.0
24 25	28.173	56.34	84.52	112.70	140.87	169.04	197.21	225.39	253.55	1690.4	3380.8	5071.2	6761.5	8451.9
26	.169	.34	.51	.68	.85	.02	.18	.36	.52	0.2	80.4	70.5	60.6	50.8
27	.166	.33	.50	.66	.83	9.00	.16	.33	.49	90.0	79.9	69.8	59.7	49.7
28	.162	.32	.49	.65	.81	8.97	.13	.30	.46	89.7	9.5	9.2	8.9	8.6
29	.158	.32	.47	.63	.79	.95	.11	.27	.42	9.5	9.0	8.5	8.0	7.5
24 30	28.155	56.31	84.46	112.62	140.77	168.93	197.08	225.24	253.39	1689.3	3378.6	5067.8	6757.1	8446.4
31	.151	.30	.45	.61	.75	.91	.05	.21	.36	9.1	8.1	7.1	6.2	5.3
32	.147	.29	.44	.59	.73	.88	.03	.18	.32	8.8	7.7	6.5	5.3	4.1
33	.143	.29	.43	.58	.72	.86	7.00	.15	.29	8.6	7.2	5.8	4.4	3.0
34	.140	.28	.42	.56	.70	.84	6.98	.12	.26	8.4	6.8	5.2	3.5	1.9
24 35	28.136	56.27	84.41	112.55	140.68	168.82	196.95	225.09	253.22	1688.2	3376.3	5064.5	6752.6	8440.8
36	.132	.26	.40	.53	.66	.79	.92	.06	.19	7.9	5.9	3.8	1.7	39.7
37	.129	.25	.39	.51	.64	.77	.90	.03	.16	7.7	5.4	3.1	0.8	8.6
38	.125	.25	.37	.50	.63	.75	.87	5.00	.13	7.5	5.0	2.5	50.0	7.4
39	.121	.24	.36	.48	.61	.72	.85	4.97	.09	7.2	4.5	1.8	49.1	6.3
24 40	28.117	56.23	84.35	112.47	140.59	168.70	196.82	224.94	253.06	1687.0	3374.1	5061.1	6748.2	8435.2
41	.114	.22	.34	.46	.57	.68	.79	.91	3.03	6.8	3.6	60.4	7.3	4.1
42	.110	.22	.33	.44	.55	.66	.77	.88	2.99	6.6	3.2	59.8	6.4	3.0
43	.106	.21	.32	.43	.53	.63	.74	.85	.96	6.3	2.7	9.1	5.5	1.8
44	.102	.20	.31	.41	.51	.61	.72	.82	.92	6.1	2.3	8.5	4.6	30.7
24 45	28.099	56.20	84.30	112.40	140.50	168.59	196.69	224.79	252.89	1685.9	3371.8	5057.8	6743.7	8429.6
46	.095	.19	.28	.38	.48	.57	.66	.76	.86	5.7	1.4	7.1	2.8	8.5
47	.091	.18	.27	.37	.46	.55	.64	.73	.82	5.5	0.9	6.4	1.9	7.3
48	.087	.17	.26	.35	.44	.52	.61	.70	.79	5.2	0.5	5.8	1.0	6.2
49	.084	.17	.25	.34	.42	.50	.59	.67	.75	5.0	70.0	5.1	40.1	5.1
24 50	28.080	56.16	84.24	112.32	140.40	168.48	196.56	224.64	252.72	1684.8	3369.6	5054.4	6739.2	8424.0
51	.076	.15	.23	.31	.38	.46	.53	.61	.69	4.6	9.1	3.7	8.3	2.8
52	.072	.14	.22	.29	.36	.43	.51	.58	.65	4.3	8.7	3.0	7.4	1.7
53	.069	.14	.21	.28	.34	.41	.48	.55	.62	4.1	8.2	2.4	6.4	20.6
54	.065	.13	.19	.26	.32	.39	.46	.52	.58	3.9	7.8	1.7	5.5	19.4
24 55	28.061	56.12	84.18	112.25	140.31	168.37	196.43	224.49	252.55	1683.7	3367.3	5051.0	6734.6	8418.3
56	.057	.11	.17	.23	.29	.34	.40	.46	.52	3.4	6.9	50.3	3.7	7.2
57	.053	.10	.16	.22	.27	.32	.38	.43	.48	3.2	6.4	49.6	2.8	6.0
58	.050	.10	.15	.20	.25	.30	.35	.40	.45	3.0	6.0	9.0	1.9	4.9
59	.046	.09	.14	.19	.23	.27	.33	.37	.41	2.7	5.5	8.3	1.0	3.8
24 60	28.042	56.08	84.13	112.17	140.21	168.25	196.30	224.34	252.38	1682.5	3365.1	5047.6	6730.1	8412.7

Lat.		Latitude 24° to 25°—Meridional arcs.						Latitude 24°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 24° 30′		Value of 1′	Continuous sums of minutes from latitude 24° 00′		Longitude.	X	Y
°	′	Meters.	″	Meters.	Meters.	′	Meters.	° ′	Meters.	Meters.
24	00	30.765			1845.89					
	1	5	1	30.77	.89	1	1 845.9	0 1	1 695.9	0.1
	2	5	2	61.53	.89	2	3 691.8	2	3 391.8	0.4
	3	5	3	92.30	.90	3	5 537.7	3	5 087.7	0.9
	4	5	4	123.07	.90	4	7 383.6	4	6 783.6	1.6
24	05	30.765	5	153.83	1845.91	5	9 229.5	0 5	8 479.5	2.5
	6	5	6	184.60	.91	6	11 075.4	6	10 175.4	3.6
	7	5	7	215.37	.92	7	12 921.3	7	11 871.2	4.9
	8	5	8	246.13	.92	8	14 767.2	8	13 567.1	6.4
	9	5	9	276.90	.92	9	16 613.1	9	15 263.0	8.1
24	10	30.765	10	307.67	1845.93	10	18 459.1	0 10	16 958.9	10.0
	11	6	1	338.44	.93	1	20 305.0	15	25 438.4	22.6
	12	6	2	369.20	.94	2	22 150.9	20	33 917.8	40.1
	13	6	3	399.97	.94	3	23 996.9	25	42 397.2	62.7
	14	6	4	430.74	.94	4	25 842.8	30	50 876.6	90.3
24	15	30.766	15	461.50	1845.95	15	27 688.8	0 35	59 356.0	122.9
	16	6	6	492.27	.95	6	29 534.7	40	67 835.4	160.5
	17	6	7	523.04	.96	7	31 380.7	45	76 314.8	203.2
	18	6	8	553.80	.96	8	33 226.6	50	84 794.1	250.8
	19	6	9	584.57	.96	9	35 072.6	55	93 273.4	303.5
24	20	30.766	20	615.34	1845.97	20	36 918.6	1 00	101 752.7	361.2
	21	6	1	646.10	.97	1	38 764.5	05	110 231.9	423.9
	22	6	2	676.87	.98	2	40 610.5	10	118 711.1	491.6
	23	6	3	707.64	.98	3	42 456.5	15	127 190.2	564.3
	24	6	4	738.40	.98	4	44 302.5	20	135 669.3	642.1
24	25	30.766	25	769.17	1845.99	25	46 148.4	1 25	144 148.3	724.8
	26	7	6	799.94	5.99	6	47 994.4	30	152 627.4	812.6
	27	7	7	830.70	6.00	7	49 840.4	35	161 106.3	905.4
	28	7	8	861.47	.00	8	51 686.4	40	169 585.2	1 003.2
	29	7	9	892.24	.01	9	53 532.4	45	178 064.0	1 106.1
24	30	30.767	30	923.00	1846.01	30	55 378.4	1 50	186 542.8	1 213.9
	31	7	1	953.77	.01	1	57 224 4	55	195 021.5	1 326.8
	32	7	2	984.54	.02	2	59 070.5	2 00	203 500	1 445
	33	7	3	1 015.31	.02	3	60 916.5	3 00	305 237	3 250
	34	7	4	1 046.07	.03	4	62 762.5	4 00	406 959	5 778
24	35	30.767	35	1 076.84	1846.03	35	64 608.5	5 00	508 660	9 028
	36	7	6	1 107.61	.03	6	66 454.6	6 00	610 336	13 001
	37	7	7	1 138.37	.04	7	68 300.6	7 00	711 981	17 695
	38	7	8	1 169.14	.04	8	70 146.6	8 00	813 590	23 109
	39	7	9	1 199.91	.05	9	71 992.7	9 00	915 159	29 245
24	40	30.768	40	1 230.67	1846.05	40	73 838.7	10 00	1 016 681	36 102
	41	8	1	1 261.44	.05	1	75 684.8	11 00	1 118 152	43 679
	42	8	2	1 292.21	.06	2	77 530.8	12 00	1 219 566	51 977
	43	8	3	1 322.97	.06	3	79 376.9	13 00	1 320 919	60 994
	44	8	4	1 353.74	.07	4	81 223.0	14 00	1 422 205	70 731
24	45	30.768	45	1 384.51	1846.07	45	83 069.0	15 00	1 523 420	81 186
	46	8	6	1 415.27	.08	6	84 915.1	16 00	1 624 558	92 360
	47	8	7	1 446.04	.08	7	86 761.2	17 00	1 725 614	104 251
	48	8	8	1 476.81	.08	8	88 607.3	18 00	1 826 583	116 859
	49	8	9	1 507.57	.09	9	90 453.3	19 00	1 927 460	130 184
24	50	30.768	50	1 538.34	1846.09	50	92 299.4	20 00	2 028 240	144 225
	51	8	1	1 569.11	.10	1	94 145.5	21 00	2 128 918	158 981
	52	8	2	1 599.87	.10	2	95 991.6	22 00	2 229 488	174 451
	53	8	3	1 630.64	.10	3	97 837.7	23 00	2 329 946	190 634
	54	8	4	1 661.41	.11	4	99 683.8	24 00	2 430 287	207 530
24	55	30.769	55	1 692.17	1846.11	55	101 529.9	25 00	2 530 505	225 138
	56	9	6	1 722.94	.12	6	103 376.1	26 00	2 630 596	243 458
	57	9	7	1 753.71	.12	7	105 222.2	27 00	2 730 554	262 487
	58	9	8	1 784.48	.13	8	107 068.3	28 00	2 830 374	282 225
	59	9	9	1 815.24	.13	9	108 914.4	29 00	2 930 052	302 671
24	60	30.769	60	1 846.01	1846.13	60	110 760.6	30 00	3 029 582	323 825

Latitude 25° to 26°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
25 00	28.042	56.08	84.13	112.17	140.21	168.25	196.30	224.34	252.38	1682.5	3365.1	5047.6	6730.1	8412.7
1	.038	.07	.12	.16	.19	.23	.27	.31	.35	2.3	4.6	6.9	29.2	1.5
2	.035	.07	.10	.14	.17	.21	.25	.28	.31	2.1	4.2	6.2	8.3	10.4
3	.031	.06	.09	.13	.15	.18	.22	.25	.28	1.8	3.7	5.6	7.4	09.2
4	.027	.05	.08	.11	.13	.16	.19	.22	.24	1.6	3.3	4.9	6.5	8.1
25 05	28.023	56.04	84.07	112.10	140.12	168.14	196.17	224.18	252.21	1681.4	3362.8	5044.2	6725.6	8407.0
6	.019	.04	.06	.08	.10	.12	.14	.15	.18	1.2	2.3	3.5	4.7	5.8
7	.016	.03	.05	.07	.08	.10	.11	.12	.14	1.0	1.9	2.8	3.8	4.7
8	.012	.02	.03	.05	.06	.07	.08	.09	.11	0.7	1.4	2.2	2.8	3.5
9	.008	.02	.02	.04	.04	.05	.06	.06	.07	0.5	1.0	1.5	1.9	2.4
25 10	28.004	56.01	84.01	112.02	140.02	168.03	196.03	224.03	252.04	1680.3	3360.5	5040.8	6721.0	8401.3
11	8.000	6.00	4.00	2.00	40.00	8.00	6.00	4.00	2.01	80.0	60.0	40.1	20.1	400.1
12	7.997	5.99	3.99	1.99	39.98	7.98	5.98	3.97	1.97	79.8	59.6	39.4	19.2	399.0
13	.993	.99	.98	.97	.96	.96	.95	.94	.94	9.6	9.1	8.7	8.2	7.8
14	.989	.98	.97	.96	.94	.93	.92	.91	.90	9.3	8.7	8.0	7.3	6.7
25 15	27.985	55.97	83.95	111.94	139.93	167.91	195.90	223.88	251.87	1679.1	3358.2	5037.3	6716.4	8395.5
16	.981	.96	.94	.92	.91	.89	.87	.85	.83	8.9	7.7	6.6	5.5	4.4
17	.977	.95	.93	.91	.89	.86	.84	.82	.80	8.6	7.3	5.9	4.6	3.2
18	.974	.95	.92	.89	.87	.84	.81	.79	.76	8.4	6.8	5.3	3.6	2.1
19	.970	.94	.91	.88	.85	.82	.79	.76	.73	8.2	6.4	4.6	2.7	91.0
25 20	27.966	55.93	83 90	111.86	139.83	167.80	195.76	223.73	251.69	1678.0	3355.9	5033.9	6711.8	8389.8
21	.962	.92	.89	.85	.81	.78	.73	.70	.66	7.8	5.4	3.2	0.9	8.7
22	.958	.92	.88	.83	.79	.75	.71	.67	.62	7.5	5.0	2.5	10.0	7.5
23	.954	.91	.86	.82	.77	.73	.68	.64	.59	7.3	4.5	1.8	09.0	6.3
24	.951	.90	.85	.80	.75	.70	.65	.61	.55	7.0	4.1	1.1	8.1	5.2
25 25	27.947	55.90	83.84	111.79	139.74	167.68	195.62	223.57	251.52	1676.8	3353.6	5030.4	6707.2	8384.0
26	.943	.89	.83	.77	.72	.66	.60	.54	.48	6.6	3.1	29.7	6.3	2.9
27	.939	.88	.82	.76	.70	.63	.57	.51	.45	6.3	2.7	9.0	5.4	1.7
28	.935	.87	.81	.74	.68	.61	.54	.48	.41	6.1	2.2	8.4	4.4	80.6
29	.931	.87	.79	.73	.66	.59	.52	.45	.38	5.9	1.8	7.7	3.5	79.4
25 30	27.928	55.86	83.78	111.71	139.64	167.57	195.49	223.42	251.34	1675.7	3351.3	5027.0	6702.6	8378.3
31	.924	.85	.77	.70	.62	.55	.46	.39	.31	5.5	0.8	6.3	1.7	7.1
32	.920	.84	.76	.68	.60	.52	.44	.36	.27	5.2	50.4	5.6	700.8	6.0
33	.916	.84	.75	.67	.58	.50	.41	.33	.24	5.0	49.9	4.9	699.8	4.8
34	.912	.83	.74	.65	.56	.47	.38	.30	.20	4.7	9.5	4.2	8.9	3.7
25 35	27.908	55.82	83.72	111.64	139.55	167.45	195.36	223.26	251.17	1674.5	3349.0	5023.5	6698.0	8372.5
36	.904	.81	.71	.62	.53	.43	.33	.23	.14	4.3	8.5	2.8	7.1	1.3
37	.901	.80	.70	.61	.51	.40	.30	.20	.10	4.0	8.1	2.1	6.2	70.2
38	.897	.80	.69	.59	.49	.38	.27	.17	.07	3.8	7.6	1.4	5.2	69.0
39	.893	.79	.68	.58	.47	.36	.25	.14	.03	3.6	7.2	0.7	4.3	7.9
25 40	27.889	55.78	83.67	111.56	139.45	167.33	195.22	223.11	251.00	1673.3	3346.7	5020.0	6693.4	8366.7
41	.885	.77	.66	.54	.43	.31	.19	.08	0.97	3.1	6.2	19.3	2.5	5.5
42	.881	.76	.64	.53	.41	.29	.17	.05	.93	2.9	5.7	8.6	1.5	4.4
43	.877	.76	.63	.51	.39	.26	.14	3.02	.90	2.6	5.3	7.9	90.6	3.2
44	.873	.75	.62	.50	.37	.24	.11	2.99	.86	2.4	4.8	7.2	89.6	2.0
25 45	27.869	55.74	83.61	111.48	139.35	167.22	195.09	222.95	250.82	1672.2	3344.3	5016.5	6688.7	8360.8
46	.866	.73	.60	.46	.33	.19	.06	.92	.79	1.9	3.8	5.8	7.8	59.7
47	.862	.72	.59	.45	.31	.17	.03	.89	.75	1.7	3.4	5.1	6.8	8.5
48	.858	.72	.57	.43	.29	.15	5.00	.86	.72	1.5	2.9	4.4	5.9	7.4
49	.854	.71	.56	.42	.27	.12	4.98	.83	.68	1.2	2.5	3.7	4.9	6.2
25 50	27.850	55.70	83.55	111.40	139.25	167.10	194.95	222.80	250.65	1671.0	3342.0	5013.0	6684.0	8355.0
51	.846	.69	.54	.38	.23	.08	.92	.77	.62	0.8	1.5	2.3	3.1	3.8
52	.842	.68	.53	.37	.21	.05	.90	.74	.58	0.5	1.1	1.6	2.1	2.7
53	.838	.68	.51	.35	.19	.03	.87	.71	.55	0.3	0.6	0.9	1.2	1.5
54	.834	.67	.50	.34	.17	7.01	.84	.68	.51	70.1	40.2	10.2	80.2	50.3
25 55	27.831	55.66	83.49	111.32	139.16	166.98	194.82	222.64	250.48	1669.8	3339.7	5009.5	6679.3	8349.2
56	.827	.65	.48	.30	.14	.96	.79	.61	.44	9.6	9.2	8.8	8.4	8.0
57	.823	.64	.47	.29	.12	.94	.76	.58	.41	9.4	8.7	8.1	7.4	6.8
58	.819	.64	.46	.27	.10	.91	.73	.55	.37	9.1	8.3	7.4	6.5	5.6
59	.815	.63	.44	.26	.08	.89	.71	.52	.34	8.9	7.8	6.7	5.5	4.5
25 60	27.811	55.62	83.43	111.24	139.06	166.87	194.68	222.49	250.30	1668.7	3337.3	5006.0	6674.6	8343.3

Lat.		Latitude 25° to 26°—Meridional arcs.						Latitude 25°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 25° 30′		Value of 1′	Continuous sums of minutes from latitude 25° 00′		Longitude.	X	Y
°	′	Meters.	″	Meters.	Meters.	′	Meters.	° ′	Meters.	Meters.
25	00	30.769			1846.13					
	1	9	1	30.77	.14	1	1 846.1	0 1	1 682.5	0.1
	2	9	2	61.54	.14	2	3 692.3	2	3 365.1	0.4
	3	9	3	92.31	.15	3	5 538.4	3	5 047.6	0.9
	4	9	4	123.08	.15	4	7 384.6	4	6 730.1	1.7
25	05	30.769	5	153.86	1846.15	5	9 230.7	0 5	8 412.7	2.6
	6	9	6	184.63	.16	6	11 076.9	6	10 095.2	3.7
	7	9	7	215.40	.16	7	12 923.0	7	11 777.7	5.1
	8	69	8	246.17	.17	8	14 769.2	8	13 460.3	6.6
	9	70	9	276.94	.17	9	16 615.4	9	15 142.8	8.4
25	10	30.770	10	307.71	1846.18	10	18 461.5	0 10	16 825.3	10.3
	11	0	1	338.48	.18	1	20 307.7	15	25 238.0	23.3
	12	0	2	369.25	.18	2	22 153.9	20	33 650.6	41.4
	13	0	3	400.02	.19	3	24 000.1	25	42 063.2	64.6
	14	0	4	430.79	.19	4	25 846.3	30	50 475.8	93.1
25	15	30.770	15	461.57	1846.20	15	27 692.5	0 35	58 888.4	126.7
	16	0	6	492.34	.20	6	29 538.7	40	67 301.0	165.5
	17	0	7	523.11	.21	7	31 384.9	45	75 713.5	209.4
	18	0	8	553.88	.21	8	33 231.1	50	84 126.0	258.5
	19	0	9	584.65	.21	9	35 077.3	55	92 538.5	312.8
25	20	30.770	20	615.42	1846.22	20	36 923.5	1 00	100 950.9	372.3
	21	0	1	646.19	.22	1	38 769.7	05	109 363.4	436.9
	22	0	2	676.96	.23	2	40 615.9	10	117 775.7	506.8
	23	1	3	707.73	.23	3	42 462.2	15	126 188.0	581.7
	24	1	4	738.50	.23	4	44 308.4	20	134 600.3	661.9
25	25	30.771	25	769.28	1846.24	25	46 154.6	1 25	143 012.5	747.2
	26	1	6	800.05	.24	6	48 000.9	30	151 424.7	837.7
	27	1	7	830.82	.25	7	49 847.1	35	159 836.8	933.4
	28	1	8	861.59	.25	8	51 693.4	40	168 248.9	1 034.2
	29	1	9	892.36	.26	9	53 539.6	45	176 660.9	1 140.2
25	30	30.771	30	923.13	1846.26	30	55 385.9	1 50	185 072.8	1 251.4
	31	1	1	953.90	.26	1	57 232.1	55	193 484.6	1 367.7
	32	1	2	984.67	.27	2	59 078.4	2 00	201 896	1 489
	33	1	3	1 015.44	.27	3	60 924.7	3 00	302 831	3 351
	34	1	4	1 046.21	.28	4	62 771.0	4 00	403 749	5 957
25	35	30.771	35	1 076.99	1846.28	35	64 617.2	5 00	504 645	9 307
	36	1	6	1 107.76	.29	6	66 463.5	6 00	605 514	13 401
	37	1	7	1 138.53	.29	7	68 309.8	7 00	706 349	18 239
	38	2	8	1 169.30	.29	8	70 156.1	8 00	807 146	23 821
	39	2	9	1 200.07	.30	9	72 002.4	9 00	907 899	30 146
25	40	30.772	40	1 230.84	1846.30	40	73 848.7	10 00	1 008 603	37 215
	41	2	1	1 261.61	.31	1	75 695.0	11 00	1 109 252	45 026
	42	2	2	1 292.38	.31	2	77 541.3	12 00	1 209 841	53 578
	43	2	3	1 323.15	.32	3	79 387.6	13 00	1 310 364	62 873
	44	2	4	1 353.92	.32	4	81 233.9	14 00	1 410 815	72 909
25	45	30.772	45	1 384.70	1846.32	45	83 080.3	15 00	1 511 190	8[illegible] 685
	46	2	6	1 415.47	.33	6	84 926.6	16 00	1 611 483	95 202
	47	2	7	1 446.24	.33	7	86 772.9	17 00	1 711 688	107 458
	48	2	8	1 477.01	.34	8	88 619.3	18 00	1 811 800	120 453
	49	2	9	1 507.78	.34	9	90 465.6	19 00	1 911 813	134 186
25	50	30.772	50	1 538.55	1846.35	50	92 311.9	20 00	2 011 722	148 656
	51	2	1	1 569.32	.35	1	94 158.3	21 00	2 111 522	163 862
	52	3	2	1 600.09	.35	2	96 004.6	22 00	2 211 207	179 805
	53	3	3	1 630.86	.36	3	97 851.0	23 00	2 310 771	196 482
	54	3	4	1 661.63	.36	4	99 697.4	24 00	2 410 210	213 894
25	55	30.773	55	1 692.41	1846.37	55	101 543.7	25 00	2 509 518	232 038
	56	3	6	1 723.18	.37	6	103 390.1	26 00	2 608 689	250 914
	57	3	7	1 753.95	.38	7	105 236.5	27 00	2 707 718	270 521
	58	3	8	1 784.72	.38	8	107 082.8	28 00	2 806 600	290 859
	59	3	9	1 815.49	.38	9	108 929.2	29 00	2 905 329	311 925
25	60	30.773	60	1 846.26	1846.39	60	110 775.6	30 00	3 003 900	333 718

Latitude 26° to 27°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
26 00	27.811	55.62	83.43	111.24	139.06	166.87	194.68	222.49	250.30	1668.7	3337.3	5006.0	6674.6	8343.3
1	.807	.61	.42	.23	.04	.85	.65	.46	.26	8.5	6.8	5.3	3.7	2.1
2	.803	.60	.41	.21	.02	.82	.62	.43	.23	8.2	6.3	4.6	2.7	40.9
3	.799	.60	.40	.20	9.00	.80	.60	.39	.19	8.0	5.9	3.8	1.8	39.7
4	.795	.59	.39	.18	8.98	.77	.57	.36	.16	7.7	5.4	3.1	70.8	8.6
26 05	27.791	55.58	83.37	111.17	138.96	166.75	194.54	222.33	250.12	1667.5	3334.9	5002.4	6669.9	8337.4
6	.787	.57	.36	.15	.94	.73	.51	.30	.08	7.3	4.4	1.7	9.0	6.2
7	.783	.56	.35	.14	.92	.70	.48	.27	.05	7.0	4.0	1.0	8.0	5.0
8	.779	.56	.34	.12	.90	.68	.46	.23	50.01	6.8	3.5	5000.3	7.1	3.8
9	.776	.55	.33	.11	.88	.65	.43	.20	49.98	6.5	3.1	4999.6	6.1	2.7
26 10	27.772	55.54	83.31	111.09	138.86	166.63	194.40	222.17	249.94	1666.3	3332.6	4998.9	6665.2	8331.5
11	.768	.53	.30	.07	.84	.61	.37	.14	.91	6.1	2.1	8.2	4.2	30.3
12	.764	.52	.29	.06	.82	.58	.34	.11	.87	5.8	1.6	7.5	3.3	29.1
13	.760	.52	.28	.04	.80	.56	.32	.08	.84	5.6	1.2	6.7	2.3	7.9
14	.756	.51	.27	.03	.78	.53	.29	.05	.80	5.3	0.7	6.0	1.4	6.7
26 15	27.752	55.50	83.25	111.01	138.76	166.51	194.26	222.01	249.77	1665.1	3330.2	4995.3	6660.4	8325.5
16	.748	.49	.24	0.99	.74	.49	.23	1.98	.73	4.9	29.7	4.6	59.5	4.4
17	.744	.48	.23	.98	.72	.46	.20	.95	.70	4.6	9.2	3.9	8.5	3.2
18	.740	.48	.22	.96	.70	.44	.18	.92	.66	4.4	8.8	3.2	7.6	2.0
19	.736	.47	.21	.95	.68	.41	.15	.89	.63	4.1	8.3	2.5	6.6	20.8
26 20	27.732	55.46	83.20	110.93	138.66	166.39	194.12	221.86	249.59	1663.9	3327.8	4991.8	6655.7	8319.6
21	.728	.45	.18	.91	.64	.37	.09	.83	.55	3.7	7.3	1.1	4.7	8.4
22	.724	.44	.17	.90	.62	.34	.07	.80	.52	3.4	6.9	90.4	3.8	7.2
23	.720	.44	.16	.88	.60	.32	.04	.76	.48	3.2	6.4	89.6	2.8	6.0
24	.716	.43	.15	.87	.58	.29	4.01	.73	.45	2.9	6.0	8.9	1.9	4.8
26 25	27.712	55.42	83.14	110.85	138.56	166.27	193.98	221.70	249.41	1662.7	3325.5	4988.2	6650.9	8313.6
26	.708	.41	.12	.83	.54	.25	.96	.67	.37	2.5	5.0	7.5	49.9	2.4
27	.704	.40	.11	.82	.52	.22	.93	.64	.34	2.2	4.5	6.8	9.0	1.2
28	.700	.40	.10	.80	.50	.20	.90	.60	.30	2.0	4.1	6.0	8.0	10.0
29	.696	.39	.09	.79	.48	.17	.88	.57	.27	1.7	3.6	5.3	7.1	08.9
26 30	27.692	55.38	83.08	110.77	138.46	166.15	193.85	221.54	249.23	1661.5	3323.1	4984.6	6646.1	8307.7
31	.688	.37	.07	.75	.44	.13	.82	.51	.19	1.3	2.6	3.9	5.1	6.5
32	.684	.36	.05	.74	.42	.10	.79	.48	.16	1.0	2.1	3.2	4.2	5.3
33	.680	.36	04	.72	.40	.08	.76	.44	.12	0.8	1.7	2.4	3.2	4.0
34	.676	.35	.03	.71	.38	.05	.73	.41	.09	0.5	1.2	1.7	2.3	2.8
26 35	27.672	55.34	83.02	110.69	138.36	166.03	193.71	221.38	249.05	1660.3	3320.7	4981.0	6641.3	8301.6
36	.668	.33	3.00	.67	.34	6.01	.68	.35	9.01	60.1	20.2	80.3	40.3	300.4
37	.664	.32	2.99	.66	.32	5.98	.65	.32	8.98	59.8	19.7	79.6	39.4	299.2
38	.660	.32	.98	.64	.30	.96	.62	.28	.94	9.6	9.3	8.8	8.4	8.0
39	.656	.31	.97	.63	.28	.93	.59	.25	.91	9.3	8.8	8.1	7.5	6.8
26 40	27.652	55.30	82.96	110.61	138.26	165.91	193.56	221.22	248.87	1659.1	3318.3	4977.4	6636.5	8295.6
41	.648	.29	.94	.59	.24	.89	.53	.19	.83	8.9	7.8	6.7	5.5	4.4
42	.644	.28	.93	.58	.22	.86	.50	.16	.80	8.6	7.3	6.0	4.6	3.2
43	.640	.28	.92	.56	.20	.84	.48	.12	.76	8.4	6.8	5.2	3.6	2.0
44	.636	.27	.91	.55	.18	.81	.45	.09	.73	8.1	6.3	4.5	2.7	90.8
26 45	27.632	55.26	82.90	110.53	138.16	165.79	193.42	221.06	248.69	1657.9	3315.8	4973.8	6631.7	8289.6
46	.628	.25	.88	.51	.14	.77	.39	.03	.65	7.7	5.3	3.1	30.7	8.4
47	.624	.24	.87	.50	.12	.74	.36	1.00	.62	7.4	4.8	2.3	29.7	7.2
48	.620	.24	.86	.48	.10	.72	.34	0.96	.58	7.2	4.4	1.6	8.8	6.0
49	.616	.23	.85	.47	.08	.69	.31	.93	.55	6.9	3.9	0.8	7.8	4.8
26 50	27.612	55.22	82.84	110.45	138.06	165.67	193.28	220.90	248.51	1656.7	3313.4	4970.1	6626.8	8283.6
51	.608	.21	.82	.43	.04	.65	.25	.87	.47	6.5	2.9	69.4	5.8	2.3
52	.604	.20	.81	.42	.02	.62	.22	.83	.44	6.2	2.4	8.7	4.9	81.1
53	.600	.20	.80	.40	8.00	.60	.20	.80	.40	6.0	2.0	7.9	3.9	79.9
54	.596	.19	.79	.39	7.98	.57	.17	.77	.36	5.7	1.5	7.2	3.0	8.7
26 55	27.592	55.18	82.78	110.37	137.96	165.55	193.14	220.73	248.32	1655.5	3311.0	4966.5	6622.0	8277.5
56	.588	.17	.76	.35	.94	.53	.11	.70	.29	5.3	0.5	5.8	1.0	6.3
57	.583	.16	.75	.34	.92	.50	.08	.67	.25	5.0	10.0	5.0	20.0	5.0
58	.579	.16	.74	.32	.90	.48	.06	.64	.21	4.8	09.6	4.3	19.1	3.8
59	.575	.15	.73	.31	.88	.45	.03	.60	.18	4.5	9.1	3.5	8.1	2.6
26 60	27.571	55.14	82.71	110.29	137.86	165.43	193.00	220.57	248.14	1654.3	3308.6	4962.8	6617.1	8271.4

Lat.		Latitude 26° to 27°—Meridional arcs.						Latitude 26°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 26° 30′		Value of 1′	Continuous sums of minutes from latitude 26° 00′		Longitude.	X	Y
°	′	Meters.	″	Meters.	Meters.	′	Meters.	° ′	Meters.	Meters.
26	00	30.773			1846.39					
	1	3	1	30.78	.39	1	1 846.4	0 1	1 668.7	0.1
	2	3	2	61.55	.40	2	3 692.8	2	3 337.3	0.4
	3	3	3	92.33	.40	3	5 539.2	3	5 006.0	1.0
	4	3	4	123.10	.41	4	7 385.6	4	6 674.6	1.7
26	05	30.773	5	153.88	1846.41	5	9 232.0	0 5	8 343.3	2.7
	6	4	6	184.65	.41	6	11 078.4	6	10 011.9	3.8
	7	4	7	215.43	.42	7	12 924.8	7	11 680.6	5.2
	8	4	8	246.20	.42	8	14 771.2	8	13 349.2	6.8
	9	4	9	276.98	.43	9	16 617.7	9	15 017.9	8.6
26	10	30.774	10	307.75	1846.43	10	18 464.1	0 10	16 686.6	10.6
	11	4	1	338.53	.44	1	20 310.5	15	25 029.8	23.9
	12	4	2	369.30	.44	2	22 157.0	20	33 373.1	42.6
	13	4	3	400.08	.44	3	24 003.4	25	41 716.4	66.5
	14	4	4	430.85	.45	4	25 849.9	30	50 059.6	95.8
26	15	30.774	15	461.63	1846.45	15	27 696.3	0 35	58 402.9	130.3
	16	4	6	492.40	.46	6	29 542.8	40	66 746.1	170.2
	17	4	7	523.18	.46	7	31 389.2	45	75 089.2	215.4
	18	4	8	553.96	.47	8	33 235.7	50	83 432.4	266.0
	19	5	9	584.73	.47	9	35 082.2	55	91 775.5	321.8
26	20	30.775	20	615.51	1846.47	20	36 928.6	1 00	100 118.5	383.0
	21	5	1	646.28	.48	1	38 775.1	05	108 461.5	449.5
	22	5	2	677.06	.48	2	40 621.6	10	116 804.6	521.3
	23	5	3	707.83	.49	3	42 468.1	15	125 147.5	598.4
	24	5	4	738.61	.49	4	44 314.6	20	133 490.4	680.9
26	25	30.775	25	769.38	1846.50	25	46 161.1	1 25	141 833.2	768.7
	26	5	6	800.16	.50	6	48 007.6	30	150 176.0	861.7
	27	5	7	830.93	.51	7	49 854.1	35	158 518.7	960.2
	28	5	8	861.71	.51	8	51 700.6	40	166 861.3	1 063.9
	29	5	9	892.48	.51	9	53 547.1	45	175 203.9	1 172.9
26	30	30.775	30	923.26	1846.52	30	55 393.6	1 50	183 546.4	1 287.3
	31	5	1	954.03	.52	1	57 240.1	55	191 888.9	1 407.0
	32	5	2	984.81	.53	2	59 086.7	2 00	200 231	1 532
	33	6	3	1 015.59	.53	3	60 933.2	3 00	300 332	3 447
	34	6	4	1 046.36	.54	4	62 779.7	4 00	400 416	6 128
26	35	30.776	35	1 077.14	1846.54	35	64 626.2	5 00	500 476	9 574
	36	6	6	1 107.91	.54	6	66 472.8	6 00	600 506	13 786
	37	6	7	1 138.69	.55	7	68 319.3	7 00	700 501	18 763
	38	6	8	1 169.46	.55	8	70 165.9	8 00	800 456	24 505
	39	6	9	1 200.24	.56	9	72 012.4	9 00	900 364	31 011
26	40	30.776	40	1 231.01	1846.56	40	73 859.0	10 00	1 000 218	38 282
	41	6	1	1 261.79	.57	1	75 705.6	11 00	1 100 015	46 316
	42	6	2	1 292.56	.57	2	77 552.1	12 00	1 199 747	55 114
	43	6	3	1 323.34	.58	3	79 398.7	13 00	1 299 409	64 675
	44	6	4	1 354.11	.58	4	81 245.3	14 00	1 398 994	74 998
26	45	30.776	45	1 384.89	1846.58	45	83 091.9	15 00	1 498 498	86 082
	46	6	6	1 415.66	.59	6	84 938.4	16 00	1 597 914	97 928
	47	7	7	1 446.44	.59	7	86 785.0	17 00	1 697 237	110 534
	48	7	8	1 477.21	.60	8	88 631.6	18 00	1 796 460	123 899
	49	7	9	1 507.99	.60	9	90 478.2	19 00	1 895 578	138 023
26	50	30.777	50	1 538.77	1846.61	50	92 324.8	20 00	1 994 585	152 905
	51	7	1	1 569.54	.61	1	94 171.4	21 00	2 093 475	168 544
	52	7	2	1 600.32	.61	2	96 018.1	22 00	2 192 243	184 939
	53	7	3	1 631.09	.62	3	97 864.7	23 00	2 290 882	202 089
	54	7	4	1 661.87	.62	4	99 711.3	24 00	2 389 387	219 993
26	55	30.777	55	1 692.64	1846.63	55	101 557.9	25 00	2 487 753	238 650
	56	7	6	1 723.42	.63	6	103 404.6	26 00	2 585 973	258 061
	57	7	7	1 754.19	.64	7	105 251.2	27 00	2 684 042	278 222
	58	7	8	1 784.97	.64	8	107 097.8	28 00	2 781 953	299 132
	59	7	9	1 815.74	.65	9	108 944.5	29 00	2 879 702	320 788
26	60	30.777	60	1 846.52	1846.65	60	110 791.1	30 00	2 977 281	343 197

Latitude 27° to 28°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
27 00	27.571	55.14	82.71	110.29	137.86	165.43	193.00	220.57	248.14	1654.3	3308.6	4962.8	6617.1	8271.4
1	.567	.13	.70	.27	.84	.41	2.97	.54	.10	4.1	8.1	2.1	6.1	70.2
2	.563	.12	.69	.26	.82	.38	.94	.50	.07	3.8	7.6	1.4	5.1	68.9
3	.559	.12	.68	.24	.80	.35	.91	.47	8.03	3.5	7.1	60.6	4.2	7.7
4	.555	.11	.66	.22	.78	.33	.88	.44	7.99	3.3	6.6	59.9	3.2	6.5
27 05	27.551	55.10	82.65	110.21	137.76	165.31	192.86	220.40	247.96	1653.1	3306.1	4959.2	6612.2	8265.3
6	.547	.09	.64	.19	.73	.28	.83	.37	.92	2.8	5.6	8.5	1.2	4.1
7	.543	.08	.63	.17	.71	.26	.80	.34	.88	2.6	5.1	7.7	10.2	2.8
8	.539	.08	.62	.15	.69	.23	.77	.31	.84	2.3	4.7	6.9	09.3	1.6
9	.535	.07	.60	.14	.67	.21	.74	.27	.81	2.1	4.2	6.2	8.3	60.4
27 10	27.531	55.06	82.59	110.12	137.65	165.18	192.71	220.24	247.77	1651.8	3303.7	4955.5	6607.3	8259.2
11	.526	.05	.58	.10	.63	.16	.68	.21	.73	1.6	3.2	4.8	6.3	7.9
12	.522	.04	.57	.09	.61	.13	.65	.18	.70	1.3	2.7	4.0	5.3	6.7
13	.518	.04	.55	.08	.59	.11	.63	.14	.66	1.1	2.2	3.3	4.4	5.5
14	.514	.03	.54	.06	.57	.08	.60	.11	.63	0.8	1.7	2.5	3.4	4.2
27 15	27.510	55.02	82.53	110.04	137.55	165.06	192.57	220.08	247.59	1650.6	3301.2	4951.8	6602.4	8253.0
16	.506	.01	.52	.03	.53	.04	.54	.05	.55	0.4	0.7	1.1	1.4	1.8
17	.502	.00	.51	10.01	.51	5.01	.51	20.02	.52	50.1	300.2	50.3	600.4	50.6
18	.498	5.00	.49	09.99	.49	4.99	.49	19.98	.48	49.9	299.7	49.6	599.5	49.3
19	.494	4.99	.48	.98	.47	.96	.46	.95	.45	9.6	9.2	8.8	8.5	8.1
27 20	27.490	54.98	82.47	109.96	137.45	164.94	192.43	219.92	247.41	1649.4	3298.7	4948.1	6597.5	8246.9
21	.485	.97	.46	.94	.43	.91	.40	.89	.37	9.1	8.2	7.4	6.5	5.6
22	.481	.96	.44	.93	.41	.89	.37	.85	.33	8.9	7.7	6.6	5.5	4.4
23	.477	.96	.43	.91	.39	.86	.34	.82	.30	8.6	7.3	5.9	4.5	3.2
24	.473	.95	.42	.89	.37	.84	.31	.79	.26	8.4	6.8	5.1	3.5	1.9
27 25	27.469	54.94	82.41	109.88	137.34	164.81	192.29	219.75	247.22	1648.1	3296.3	4944.4	6592.5	8240.7
26	.465	.93	.39	.86	.32	.79	.26	.72	.18	7.9	5.8	3.7	1.5	39.4
27	.461	.92	.38	.84	.30	.76	.23	.69	.14	7.6	5.3	2.9	90.5	8.2
28	.457	.92	.37	.82	.28	.74	.20	.66	.11	7.4	4.8	2.2	89.6	7.0
29	.452	.91	.36	.81	.26	.71	.17	.62	.07	7.1	4.3	1.4	8.6	5.7
27 30	27.448	54.90	82.34	109.79	137.24	164.69	192.14	219.59	247.03	1646.9	3293.8	4940.7	6587.6	8234.5
31	.444	.89	.33	.77	.22	.67	.11	.56	6.99	6.7	3.3	40.0	6.6	3.3
32	.440	.88	.32	.76	.20	.64	.08	.52	.96	6.4	2.8	39.2	5.6	2.0
33	.436	.87	.31	.74	.18	.62	.05	.49	.92	6.2	2.3	8.5	4.6	30.8
34	.432	.86	.29	.73	.16	.59	.02	.46	.88	5.9	1.8	7.7	3.6	29.5
27 35	27.428	54.86	82.28	109.71	137.13	164.57	192.00	219.42	246.84	1645.7	3291.3	4937.0	6582.6	8228.3
36	.423	.85	.27	.69	.11	.54	1.97	.39	.81	5.4	0.8	6.2	1.6	7.0
37	.419	.84	.26	.68	.09	.52	.94	.36	.77	5.2	90.3	5.5	80.6	5.8
38	.415	.83	.24	.66	.07	.49	.91	.33	.73	4.9	89.8	4.7	79.6	4.5
39	.411	.82	.23	.65	.05	.47	.88	.29	.70	4.7	9.3	4.0	8.6	3.3
27 40	27.407	54.81	82.22	109.63	137.03	164.44	191.85	219.26	246.66	1644.4	3288.8	4933.2	6577.6	8222.1
41	.403	.80	.21	.61	7.01	.42	.82	.23	.62	4.2	8.3	2.5	6.6	20.8
42	.399	.79	.20	.60	6.99	.39	.79	.19	.59	3.9	7.8	1.7	5.6	19.6
43	.394	.79	.18	.58	.97	.37	.76	.16	.55	3.7	7.3	1.0	4.6	8.3
44	.390	.78	.17	.56	.95	.34	.73	.12	.51	3.4	6.8	30.2	3.6	7.1
27 45	27.386	54.77	82.16	109.55	136.93	164.32	191.71	219.09	246.48	1643.2	3286.3	4929.5	6572.6	8215.8
46	.382	.76	.15	.53	.91	.29	.68	.06	.44	2.9	5.8	8.7	1.6	4.6
47	.378	.75	.13	.51	.89	.27	.65	9.02	.40	2.7	5.3	8.0	70.6	3.3
48	.374	.75	.12	.49	.87	.24	.62	8.99	.36	2.4	4.8	7.2	69.6	2.1
49	.369	.74	.11	.48	.85	.22	.59	.95	.33	2.2	4.3	6.5	8.6	10.8
27 50	27.365	54.73	82.10	109.46	136.83	164.19	191.56	218.92	246.29	1641.9	3283.8	4925.7	6567.6	8209.6
51	.361	.72	.08	.44	.81	.17	.53	.89	.25	1.7	3.3	5.0	6.6	8.3
52	.357	.71	.07	.43	.79	.14	.50	.85	.21	1.4	2.8	4.2	5.6	7.0
53	.353	.71	.06	.41	.77	.12	.47	.82	.18	1.2	2.3	3.5	4.6	5.8
54	.348	.70	.05	.39	.75	.09	.44	.79	.14	0.9	1.8	2.7	3.6	4.5
27 55	27.344	54.69	82.03	109.38	136.72	164.07	191.41	218.75	246.10	1640.7	3281.3	4922.0	6562.6	8203.3
56	.340	.68	.02	.36	.70	.04	.38	.72	.06	0.4	0.8	1.2	1.6	2.0
57	.336	.67	.01	.34	.68	4.02	.35	.69	6.02	40.2	80.3	20.5	60.6	200.7
58	.332	.67	2.00	.32	.66	3.99	.32	.66	5.99	39.9	79.8	19.7	59.6	199.5
59	.327	.66	1.98	.31	.64	.96	.29	.62	.95	9.6	9.3	8.9	8.6	8.2
27 60	27.323	54.65	81.97	109.29	136.62	163.94	191.26	218.59	245.91	1639.4	3278.8	4918.2	6557.6	8197.0

Lat.		Latitude 27° to 28°—Meridional arcs.						Latitude 27°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 27° 30′		Value of 1′	Continuous sums of minutes from latitude 27° 00′		Longitude.	X	Y
°	′	Meters.	″	Meters.	Meters.	′	Meters.	° ′	Meters.	Meters.
27	00	30.777			1846.65					
	1	8	1	30.78	.65	1	1 846.7	0 1	1 654.3	0.1
	2	8	2	61.56	.66	2	3 693.3	2	3 308.5	0.4
	3	8	3	92.34	.66	3	5 540.0	3	4 962.8	1.0
	4	8	4	123.12	.67	4	7 386.6	4	6 617.1	1.7
27	05	30.778	5	153.90	1846.67	5	9 233.3	0 5	8 271.4	2.7
	6	8	6	184.68	.68	6	11 080.0	6	9 925.7	3.9
	7	8	7	215.46	.68	7	12 926.7	7	11 579.9	5.4
	8	8	8	246.24	.69	8	14 773.3	8	13 234.2	7.0
	9	8	9	277.02	.69	9	16 620.0	9	14 888.5	8.8
27	10	30.778	10	307.80	1846.69	10	18 466.7	0 10	16 542.8	10.9
	11	8	1	338.58	.70	1	20 313.4	15	24 814.1	24.6
	12	8	2	369.36	.70	2	22 160.1	20	33 085.5	43.7
	13	8	3	400.14	.71	3	24 006.8	25	41 356.9	68.3
	14	9	4	430.92	.71	4	25 853.5	30	49 628.2	98.3
27	15	30.779	15	461.70	1846.72	15	27 700.2	0 35	57 899.5	133.8
	16	9	6	492.48	.72	6	29 547.0	40	66 170.8	174.8
	17	9	7	523.26	.73	7	31 393.7	45	74 442.1	221.2
	18	9	8	554.04	.73	8	33 240.4	50	82 713.3	273.1
	19	9	9	584.81	.73	9	35 087.2	55	90 984.5	330.4
27	20	30.779	20	615.59	1846.74	20	36 933.9	1 00	99 255.7	393.2
	21	9	1	646.37	.74	1	38 780.6	05	107 526.8	461.5
	22	9	2	677.15	.75	2	40 627.4	10	115 797.9	535.2
	23	9	3	707.93	.75	3	42 474.1	15	124 068.9	614.4
	24	9	4	738.71	.76	4	44 320.9	20	132 339.9	699.1
27	25	30.779	25	769.49	1846.76	25	46 167.6	1 25	140 610.8	789.2
	26	9	6	800.27	.77	6	48 014.4	30	148 881.6	884.8
	27	9	7	831.05	.77	7	49 861.2	35	157 152.3	985.8
	28	80	8	861.83	.77	8	51 707.9	40	165 423.1	1 092.3
	29	0	9	892.61	.78	9	53 554.7	45	173 693.7	1 204.3
27	30	30.780	30	923.39	1846.78	30	55 401.5	1 50	181 964.3	1 321.7
	31	0	1	954.17	.79	1	57 248.3	55	190 234.7	1 444.6
	32	0	2	984.95	.79	2	59 095.1	2 00	198 505	1 573
	33	0	3	1 015.73	.80	3	60 941.9	3 00	297 742	3 539
	34	0	4	1 046.51	.80	4	62 788.7	4 00	396 960	6 291
27	35	30.780	35	1 077.29	1846.81	35	64 635.5	5 00	496 154	9 829
	36	0	6	1 108.07	.81	6	66 482.3	6 00	595 316	14 154
	37	0	7	1 138.85	.81	7	68 329.1	7 00	694 440	19 264
	38	0	8	1 169.63	.82	8	70 175.9	8 00	793 522	25 159
	39	0	9	1 200.41	.82	9	72 022.7	9 00	892 554	31 839
27	40	30.780	40	1 231.19	1846.83	40	73 869.6	10 00	991 529	39 303
	41	1	1	1 261.97	.83	1	75 716.4	11 00	1 090 442	47 551
	42	1	2	1 292.75	.84	2	77 563.2	12 00	1 189 287	56 583
	43	1	3	1 323.53	.84	3	79 410.1	13 00	1 288 057	66 398
	44	1	4	1 354.31	.85	4	81 256.9	14 00	1 386 746	76 995
27	45	30.781	45	1 385.09	1846.85	45	83 103.7	15 00	1 485 348	88 374
	46	1	6	1 415.87	.86	6	84 950.6	16 00	1 583 857	100 534
	47	1	7	1 446.65	.86	7	86 797.5	17 00	1 682 267	113 474
	48	1	8	1 477.43	.86	8	88 644.3	18 00	1 780 570	127 193
	49	1	9	1 508.21	.87	9	90 491.2	19 00	1 878 762	141 690
27	50	30.781	50	1 538.99	1846.87	50	92 338.1	20 00	1 976 836	156 966
	51	1	1	1 569.77	.88	1	94 184.9	21 00	2 074 786	173 018
	52	1	2	1 600.55	.88	2	96 031.8	22 00	2 172 606	189 845
	53	1	3	1 631.33	.89	3	97 878.7	23 00	2 270 289	207 447
	54	2	4	1 662.11	.89	4	99 725.6	24 00	2 367 830	225 823
27	55	30.782	55	1 692.88	1846.90	55	101 572.5	25 00	2 465 222	244 970
	56	2	6	1 723.66	.90	6	103 419.4	26 00	2 562 459	264 889
	57	2	7	1 754.44	.90	7	105 266.3	27 00	2 659 535	285 577
	58	2	8	1 785.22	.91	8	107 113.2	28 00	2 756 445	307 035
	59	2	9	1 816.00	.91	9	108 960.1	29 00	2 853 181	329 259
27	60	30.782	60	1 846.78	1846.92	60	110 807.0	30 00	2 949 739	352 249

Latitude 28° to 29°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
28 00	27.323	54.65	81.97	109.29	136.62	163.94	191.26	218.59	245.91	1639.4	3278.8	4918.2	6557.6	8197.0
1	.319	.64	.96	.27	.60	.91	.23	.56	.87	9.1	8.3	7.4	6.6	5.7
2	.315	.63	.94	.26	.58	.89	.20	.52	.83	8.9	7.8	6.7	5.6	4.4
3	.311	.62	.93	.24	.56	.86	.17	.49	.80	8.6	7.3	5.9	4.5	3.2
4	.306	.61	.92	.22	.54	.84	.14	.45	.76	8.4	6.8	5.2	3.5	1.9
28 05	27.302	54.60	81.91	109.21	136.51	163.81	191.12	218.42	245.72	1638.1	3276.3	4914.4	6552.5	8190.7
6	.298	.60	.89	.19	.49	.79	.09	.39	.68	7.9	5.8	3.6	1.5	89.4
7	.294	.59	.88	.17	.47	.76	.06	.35	.66	7.6	5.3	2.9	50.5	8.1
8	.290	.58	.87	.15	.45	.74	.03	.32	.61	7.4	4.7	2.1	49.5	6.9
9	.285	.57	.86	.14	.43	.71	1.00	.28	.57	7.1	4.2	1.4	8.5	5.6
28 10	27.281	54.56	81.84	109.12	136.41	163.69	190.97	218.25	245.53	1636.9	3273.7	4910.6	6547.5	8184.3
11	.277	.55	.83	.10	.39	.66	.94	.22	.49	6.6	3.2	09.8	6.5	3.1
12	.273	.54	.82	.09	.37	.64	.91	.18	.45	6.4	2.7	9.1	5.4	1.8
13	.268	.54	.80	.07	.34	.61	.88	.15	.42	6.1	2.2	8.5	4.4	80.5
14	.264	.53	.79	.05	.32	.59	.85	.11	.38	5.9	1.7	7.6	3.4	79.3
28 15	27.260	54.52	81.78	109.04	136.30	163.56	190.82	218.08	245.34	1635.6	3271.2	4906.8	6542.4	8178.0
16	.256	.51	.77	.02	.28	.53	.79	.05	.30	5.3	0.7	6.0	1.4	6.7
17	.251	.50	.75	9.00	.26	.51	.76	8.01	.26	5.1	70.2	5.3	40.3	5.4
18	.247	.50	.74	8.98	.23	.48	.73	7.98	.23	4.8	69.6	4.5	39.3	4.2
19	.243	.49	.73	.97	.21	.46	.70	.94	.19	4.6	9.1	3.8	8.3	2.9
28 20	27.239	54.48	81.72	108.95	136.19	163.43	190.67	217.91	245.15	1634.3	3268.6	4903.0	6537.3	8171.6
21	.234	.47	.70	.93	.17	.41	.64	.88	.11	4.1	8.1	2.2	6.3	70.3
22	.230	.46	.69	.92	.15	.38	.61	.84	.07	3.8	7.6	1.4	5.2	69.1
23	.226	.45	.68	.90	.13	.36	.58	.81	.03	3.6	7.1	900.7	4.2	7.8
24	.222	.44	.67	.88	.11	.33	.55	.77	5.01	3.3	6.6	899.9	3.2	6.5
28 25	27.217	54.44	81.65	108.87	136.08	163.30	190.52	217.74	244.96	1633.0	3266.1	4899.1	6532.2	8165.2
26	.213	.43	.64	.85	.06	.28	.49	.71	.92	2.8	5.6	8.3	1.2	3.9
27	.209	.42	.63	.83	.04	.25	.46	.67	.88	2.5	5.1	7.6	30.1	2.7
28	.205	.41	.61	.81	.02	.23	.43	.64	.84	2.3	4.5	6.8	29.1	1.4
29	.200	.40	.60	.80	6.00	.20	.40	.60	.80	2.0	4.0	6.1	8.1	60.1
28 30	27.196	54.39	81.59	108.78	135.98	163.18	190.37	217.57	244.76	1631.8	3263.5	4895.3	6527.1	8158.8
31	.192	.38	.58	.76	.96	.15	.34	.54	.72	1.5	3.0	4.5	6.0	7.5
32	.188	.37	.56	.75	.94	.13	.31	.50	.68	1.3	2.5	3.7	5.0	6.3
33	.183	.37	.55	.73	.92	.10	.28	.47	.65	1.0	2.0	3.0	4.0	5.0
34	.179	.36	.54	.71	.90	.08	.25	.43	.61	0.8	1.5	2.2	2.9	3.7
28 35	27.175	54.35	81.52	108.70	135.87	163.05	190.22	217.40	244.57	1630.5	3261.0	4891.4	6521.9	8152.4
36	.170	.34	.51	.68	.85	.02	.19	.37	.53	0.2	0.5	90.6	20.9	51.1
37	.166	.33	.50	.66	.83	3.00	.16	.33	.49	30.0	60.0	89.9	19.9	49.8
38	.162	.33	.49	.64	.81	2.97	.13	.30	.46	29.7	59.4	9.1	8.8	8.5
39	.158	.32	.47	.63	.79	.95	.10	.26	.42	9.5	8.9	8.4	7.8	7.3
28 40	27.153	54.31	81.46	108.61	135.77	162.92	190.07	217.23	244.38	1629.2	3258.4	4887.6	6516.8	8146.0
41	.149	.30	.45	.59	.75	.89	.04	.20	.34	8.9	7.9	6.8	5.7	4.7
42	.145	.29	.43	.58	.73	.87	90.01	.16	.30	8.7	7.4	6.0	4.7	3.4
43	.140	.28	.42	.56	.70	.84	89.98	.13	.26	8.4	6.8	5.3	3.7	2.1
44	.136	.27	.41	.54	.68	.82	.95	.09	.22	8.2	6.3	4.5	2.6	40.8
28 45	27.132	54.27	81.40	108.53	135.66	162.79	189.92	217.06	244.18	1627.9	3255.8	4883.7	6511.6	8139.5
46	.127	.26	.38	.51	.64	.76	.89	7.02	.15	7.6	5.3	2.9	10.6	8.2
47	.123	.25	.37	.49	.62	.74	.86	6.99	.11	7.4	4.8	2.1	09.5	6.9
48	.119	.24	.36	.47	.59	.71	.83	.95	.07	7.1	4.2	1.4	8.5	5.6
49	.115	.23	.34	.46	.57	.69	.80	.92	4.03	6.9	3.7	80.6	7.5	4.4
28 50	27.110	54.22	81.33	108.44	135.55	162.66	189.77	216.88	243.99	1626.6	3253.2	4879.8	6506.4	8133.1
51	.106	.21	.32	.42	.53	.64	.74	.85	.95	6.4	2.7	9.1	5.4	1.8
52	.102	.20	.30	.41	.51	.61	.71	.81	.91	6.1	2.2	8.2	4.4	30.5
53	.097	.19	.29	.39	.48	.58	.68	.78	.87	5.8	1.6	7.5	3.3	29.2
54	.093	.18	.28	.37	.46	.56	.65	.74	.83	5.6	1.1	6.7	2.3	7.9
28 55	27.089	54.18	81.27	108.36	135.44	162.53	189.62	216.71	243.80	1625.3	3250.6	4875.9	6501.2	8126.6
56	.084	.17	.25	.34	.42	.51	.59	.68	.76	5.1	50.1	5.2	500.2	5.3
57	.080	.16	.24	.32	.40	.48	.56	.64	.72	4.8	49.6	4.3	499.2	4.0
58	.076	.15	.23	.30	.37	.45	.53	.61	.68	4.5	9.0	3.6	8.1	2.7
59	.071	.14	.21	.29	.35	.43	.50	.57	.64	4.3	8.5	2.8	7.1	1.4
28 60	27.067	54.13	81.20	108.27	135.33	162.40	189.47	216.54	243.60	1624.0	3248.0	4872.0	6496.1	8120.1

Lat.		Latitude 28° to 29°—Meridional arcs.						Latitude 28°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 28° 30′		Value of 1′.	Continuous sums of minutes from latitude 28° 00′		Longitude.	X	Y
°	′	Meters.	″	Meters.	Meters.	′	Meters.	° ′	Meters.	Meters.
28	00	30.782			1846.92					
	1	2	1	30.78	.92	1	1 846.9	0 1	1 639.4	0.1
	2	2	2	61.57	.93	2	3 693.8	2	3 278.8	0.4
	3	2	3	92.35	.93	3	5 540.8	3	4 918.2	1.0
	4	2	4	123.14	.94	4	7 387.7	4	6 557.6	1.8
28	05	30.782	5	153.92	1846.94	5	9 234.6	0 5	8 197.0	2.8
	6	2	6	184.71	.95	6	11 081.6	6	9 836.4	4.0
	7	2	7	215.49	.95	7	12 928.5	7	11 475.7	5.5
	8	3	8	246.27	.95	8	14 775.5	8	13 115.1	7.2
	9	3	9	277.06	.96	9	16 622.5	9	14 754.5	9.1
28	10	30.783	10	307.84	1846.96	10	18 469.4	0 10	16 393.9	11.2
	11	3	1	338.63	.97	1	20 316.4	15	24 590.9	25.2
	12	3	2	369.41	.97	2	22 163.3	20	32 787.9	44.8
	13	3	3	400.20	.98	3	24 010.3	25	40 984.8	70.0
	14	3	4	430.98	.98	4	25 857.3	30	49 181.7	100.7
28	15	30.783	15	461.76	1846.99	15	27 704.3	0 35	57 378.6	137.1
	16	3	6	492.55	6.99	6	29 551.3	40	65 575.5	179.1
	17	3	7	523.33	7.00	7	31 398.3	45	73 772.4	226.7
	18	3	8	554.12	.00	8	33 245.3	50	81 969.2	279.8
	19	3	9	584.90	.00	9	35 092.3	55	90 165.9	338.6
28	20	30.783	20	615.69	1847.01	20	36 939.3	1 00	98 362.6	403.0
	21	4	1	646.47	.01	1	38 786.3	05	106 559.3	472.9
	22	4	2	677.25	.02	2	40 633.3	10	114 756.0	548.5
	23	4	3	708.04	.02	3	42 480.3	15	122 952.5	629.6
	24	4	4	738.82	.03	4	44 327.4	20	131 149.0	716.4
28	25	30.784	25	769.61	1847.03	25	46 174.4	1 25	139 345.5	808.7
	26	4	6	800.39	.04	6	48 021.4	30	147 541.9	906.7
	27	4	7	831.17	.04	7	49 868.5	35	155 738.2	1 010.2
	28	4	8	861.96	.05	8	51 715.5	40	163 934.5	1 119.4
	29	4	9	892.74	.05	9	53 562.5	45	172 130.7	1 234.1
28	30	30.784	30	923.53	1847.06	30	55 409.6	1 50	180 326.8	1 354.4
	31	4	1	954.31	.06	1	57 256.7	55	188 522.8	1 480.4
	32	4	2	985.10	.06	2	59 103.7	2 00	196 719	1 612
	33	4	3	1 015.88	.07	3	60 950.8	3 00	295 062	3 627
	34	5	4	1 046.66	.07	4	62 797.9	4 00	393 385	6 447
28	35	30.785	35	1 077.45	1847.08	35	64 644.9	5 00	491 682	10 073
	36	5	6	1 108.23	.08	6	66 492.0	6 00	589 945	14 505
	37	5	7	1 139.02	.09	7	68 339.1	7 00	688 168	19 741
	38	5	8	1 169.80	.09	8	70 186.2	8 00	786 347	25 782
	39	5	9	1 200.59	.10	9	72 033.3	9 00	884 472	32 627
28	40	30.785	40	1 231.37	1847.10	40	73 880.4	10 00	982 537	40 276
	41	5	1	1 262.15	.11	1	75 727.5	11 00	1 080 537	48 728
	42	5	2	1 292.94	.11	2	77 574.6	12 00	1 178 464	57 983
	43	5	3	1 323.72	.11	3	79 421.7	13 00	1 276 312	68 040
	44	5	4	1 354.51	.12	4	81 268.8	14 00	1 374 075	78 899
28	45	30.785	45	1 385.29	1847.12	45	83 115.9	15 00	1 471 745	90 558
	46	5	6	1 416.08	.13	6	84 963.1	16 00	1 569 315	103 017
	47	6	7	1 446.86	.13	7	86 810.2	17 00	1 666 781	116 275
	48	6	8	1 477.64	.14	8	88 657.3	18 00	1 764 135	130 331
	49	6	9	1 508.43	.14	9	90 504.5	19 00	1 861 371	145 185
28	50	30.786	50	1 539.21	1847.15	50	92 351.6	20 00	1 958 481	160 835
	51	6	1	1 570.00	.15	1	94 198.8	21 00	2 055 460	177 280
	52	6	2	1 600.78	.16	2	96 045.9	22 00	2 152 302	194 518
	53	6	3	1 631.57	.16	3	97 893.1	23 00	2 248 998	212 550
	54	6	4	1 662.35	.17	4	99 740.2	24 00	2 345 544	231 374
28	55	30.786	55	1 693.13	1847.17	55	101 587.4	25 00	2 441 932	250 988
	56	6	6	1 723.92	.17	6	103 434.6	26 00	2 538 156	271 391
	57	6	7	1 754.70	.18	7	105 281.8	27 00	2 634 210	292 582
	58	6	8	1 785.49	.18	8	107 128.9	28 00	2 730 087	314 559
	59	6	9	1 816.27	.19	9	108 976.1	29 00	2 825 779	337 321
28	60	30.787	60	1 847.06	1847.19	60	110 823.3	30 00	2 921 284	360 866

Latitude 29° to 30°—arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
29 00	27.067	54.13	81.20	108.27	135.33	162.40	189.47	216.54	243.60	1624.0	3248.0	4872.0	6496.1	8120.1
1	.063	.12	.19	.25	.31	.38	.44	.50	.56	3.8	7.5	1.2	5.0	18.8
2	.058	.11	.17	.23	.29	.35	.41	.47	.52	3.5	7.0	70.4	4.0	7.5
3	.054	.11	.16	.22	.27	.32	.38	.43	.48	3.2	6.4	69.7	2.9	6.1
4	.049	.10	.15	.20	.25	.30	.35	.40	.44	3.0	5.9	8.9	1.9	4.8
29 05	27.045	54.09	81.13	108.18	135.22	162.27	189.31	216.36	243.40	1622.7	3245.4	4868.1	6490.8	8113.5
6	.041	.08	.12	.16	.20	.24	.28	.33	.37	2.4	4.9	7.3	89.8	2.2
7	.036	.07	.11	.14	.18	.22	.25	.29	.33	2.2	4.4	6.5	8.7	10.9
8	.032	.07	.10	.13	.16	.19	.22	.26	.29	1.9	3.8	5.8	7.7	09.6
9	.028	.06	.08	.11	.14	.17	.19	.22	.25	1.7	3.3	5.0	6.6	8.3
29 10	27.023	54.05	81.07	108.09	135.12	162.14	189.16	216.19	243.21	1621.4	3242.8	4864.2	6485.6	8107.0
11	.019	.04	.06	.07	.10	.11	.13	.15	.17	1.1	2.3	3.4	4.6	5.7
12	.015	.03	.04	.06	.08	.09	.10	.12	.13	0.9	1.8	2.6	3.5	4.4
13	.010	.02	.03	.04	.05	.06	.07	.08	.09	0.6	1.2	1.9	2.5	3.1
14	.006	.01	.02	.02	.03	.03	.04	.05	.05	0.3	0.7	1.1	1.4	1.7
29 15	27.001	54.00	81.00	108.00	135.01	162.01	189.01	216.01	243.02	1620.1	3240.2	4860.3	6480.4	8100.4
16	6.997	4.00	0.99	7.99	4.99	1.98	8.98	5.98	2.97	19.8	39.6	59.5	79.3	099.1
17	.993	3.99	.98	.97	.97	.96	.95	.94	.93	9.6	9.1	8.7	8.3	7.8
18	.988	.98	.97	.95	.94	.93	.92	.91	.90	9.3	8.6	7.9	7.2	6.5
19	.984	.97	.95	.94	.92	.90	.89	.87	.86	9.0	8.1	7.1	6.2	5.2
29 20	26.980	53.96	80.94	107.92	134.90	161.88	188.86	215.84	242.82	1618.8	3237.6	4856.3	6475.1	8093.9
21	.975	.95	.93	.90	.88	.85	.83	.80	.78	8.5	7.0	5.5	4.1	2.6
22	.971	.94	.91	.88	.85	.82	.80	.77	.74	8.2	6.5	4.7	3.0	91.2
23	.966	.93	.90	.87	.83	.80	.77	.73	.70	8.0	6.0	4.0	1.9	89.9
24	.962	.92	.89	.85	.81	.77	.74	.70	.66	7.7	5.4	3.2	70.9	8.6
29 25	26.958	53.91	80.87	107.83	134.79	161.75	188.70	215.66	242.62	1617.5	3234.9	4852.4	6469.8	8087.3
26	.953	.91	.86	.81	.77	.72	.67	.62	.58	7.2	4.4	1.6	8.8	6.0
27	.949	.90	.85	.79	.75	.69	.64	.59	.54	6.9	3.8	0.8	7.7	4.6
28	.944	.89	.83	.78	.72	.67	.61	.55	.50	6.7	3.3	50.0	6.6	3.3
29	.940	.88	.82	.76	.70	.64	.58	.52	.46	6.4	2.8	49.2	5.6	2.0
29 30	26.936	53.87	80.81	107.74	134.68	161.61	188.55	215.48	242.42	1616.1	3232.3	4848.4	6464.5	8080.7
31	.931	.86	.79	.72	.66	.59	.52	.45	.38	5.9	1.8	7.6	3.5	79.4
32	.927	.85	.78	.71	.64	.56	.49	.41	.34	5.6	1.2	6.8	2.4	8.0
33	.922	.84	.77	.69	.61	.53	.46	.38	.30	5.3	0.7	6.0	1.4	6.7
34	.918	.83	.75	.67	.59	.51	.43	.34	.26	5.1	30.2	5.2	60.3	5.4
29 35	26.913	53.83	80.74	107.66	134.57	161.48	188.39	215.31	242.22	1614.8	3229.6	4844.4	6459.2	8074.0
36	.909	.82	.73	.64	.55	.45	.36	.27	.18	4.5	9.1	3.6	8.2	2.7
37	.905	.81	.71	.62	.53	.43	.33	.24	.14	4.3	8.6	2.8	7.1	1.4
38	.900	.80	.70	.60	.50	.40	.30	.20	.10	4.0	8.0	2.0	6.0	70.1
39	.896	.79	.69	.59	.48	.37	.27	.17	.06	3.7	7.5	1.2	5.0	68.7
29 40	26.891	53.78	80.67	107.57	134.46	161.35	188.24	215.13	242.02	1613.5	3227.0	4840.4	6453.9	8067.4
41	.887	.77	.66	.55	.44	.32	.21	.10	1.98	3.2	6.4	39.6	2.9	6.1
42	.882	.76	.65	.53	.41	.29	.18	.06	.94	2.9	5.9	8.8	1.8	4.7
43	.878	.75	.63	.51	.39	.27	.15	5.02	.90	2.7	5.4	8.0	50.7	3.4
44	.874	.75	.62	.50	.37	.24	.12	4.99	.86	2.4	4.8	7.2	49.7	2.1
29 45	26.869	53.74	80.61	107.48	134.35	161.21	188.08	214.95	241.82	1612.1	3224.3	4836.4	6448.6	8060.7
46	.865	.73	.59	.46	.33	.19	.05	.92	.78	1.9	3.8	5.6	7.5	59.4
47	.860	.72	.58	.44	.31	.16	8.02	.88	.74	1.6	3.2	4.8	6.5	8.1
48	.856	.71	.57	.43	.28	.13	7.99	.85	.70	1.3	2.7	4.1	5.4	6.7
49	.851	.70	.55	.41	.26	.11	.96	.81	.66	1.1	2.2	3.3	4.3	5.4
29 50	26.847	53.69	80.54	107.39	134.24	161.08	187.93	214.78	241.62	1610.8	3221.6	4832.5	6443.3	8054.1
51	.842	.68	.53	.37	.21	.05	.90	.74	.58	0.5	1.1	1.7	2.2	2.7
52	.838	.67	.51	.35	.19	.03	.87	.70	.54	0.3	0.6	0.9	1.1	1.4
53	.834	.67	.50	.34	.17	1.00	.84	.67	.50	10.0	20.0	30.0	40.1	50.1
54	.829	.66	.49	.32	.15	0.97	.81	.63	.46	09.7	19.5	29.2	39.0	48.7
29 55	26.825	53.65	80.47	107.30	134.12	160.95	187.77	214.60	241.42	1609.5	3219.0	4828.4	6437.9	8047.4
56	.820	.64	.46	.28	.10	.92	.74	.56	.38	9.2	8.4	7.6	6.8	6.0
57	.816	.63	.45	.26	.08	.89	.71	.53	.34	8.9	7.9	6.8	5.8	4.7
58	.811	.62	.43	.25	.06	.87	.68	.49	.30	8.7	7.4	6.0	4.7	3.4
59	.807	.61	.42	.23	.03	.84	.65	.45	.26	8.4	6.8	5.2	3.6	2.0
29 60	26.802	53.60	80.41	107.21	134.01	160.81	187.62	214.42	241.22	1608.1	3216.3	4824.4	6432.5	8040.7

Lat.		Latitude 29° to 30°—Meridional arcs.						Latitude 29°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 29° 30′		Value of 1′	Continuous sums of minutes from latitude 29° 00′		Longitude.	X	Y
°	′	Meters.	″	Meters.	Meters.	′	Meters.	° ′	Meters.	Meters.
29	00	30.787			1847.19					
	1	7	1	30.79	.20	1	1 847.2	0 1	1 624.0	0.1
	2	7	2	61.58	.20	2	3 694.4	2	3 248.0	0.5
	3	7	3	92.37	.21	3	5 541.6	3	4 872.0	1.0
	4	7	4	123.16	.21	4	7 388.8	4	6 496.1	1.8
29	05	30.787	5	153.94	1847.22	5	9 236.0	0 5	8 120.1	2.9
	6	7	6	184.73	.22	6	11 083.2	6	9 744.1	4.1
	7	7	7	215.52	.23	7	12 930.5	7	11 368.1	5.6
	8	7	8	246.31	.23	8	14 777.7	8	12 992.1	7.3
	9	7	9	277.10	.24	9	16 624.9	9	14 616.1	9.3
29	10	30.787	10	307.89	1847.24	10	18 472.2	0 10	16 240.1	11.5
	11	7	1	338.68	.24	1	20 319.4	15	24 360.2	25.8
	12	7	2	369.47	.25	2	22 166.7	20	32 480.2	45.8
	13	8	3	400.26	.25	3	24 013.9	25	40 600.2	71.6
	14	8	4	431.04	.26	4	25 861.2	30	48 720.3	103.1
29	15	30.788	15	461.83	1847.26	15	27 708.4	0 35	56 840.2	140.3
	16	8	6	492.62	.27	6	29 555.7	40	64 960.2	183.2
	17	8	7	523.41	.27	7	31 403.0	45	73 080.1	231.9
	18	8	8	554.20	.28	8	33 250.2	50	81 200.0	286.3
	19	8	9	584.99	.28	9	35 097.5	55	89 319.8	346.4
29	20	30.788	20	615.78	1847.29	20	36 944.8	1 00	97 439.6	412.2
	21	8	1	646.57	.29	1	38 792.1	05	105 559.4	483.8
	22	8	2	677.36	.30	2	40 639.4	10	113 679.1	561.1
	23	8	3	708.14	.30	3	42 486.7	15	121 798.7	644.1
	24	8	4	738.93	.31	4	44 334.0	20	129 918.3	732.9
29	25	30.788	25	769.72	1847.31	25	46 181.3	1 25	138 037.8	827.4
	26	9	6	800.51	.31	6	48 028.6	30	146 157.3	927.6
	27	9	7	831.30	.32	7	49 875.9	35	154 276.7	1 033.5
	28	9	8	862.09	.32	8	51 723.2	40	162 396.0	1 145.1
	29	9	9	892.88	.33	9	53 570.6	45	170 515.2	1 262.5
29	30	30.789	30	923.67	1847.33	30	55 417.9	1 50	178 634.3	1 385.6
	31	9	1	954.46	.34	1	57 265.2	55	186 753.4	1 514.4
	32	9	2	985.24	.34	2	59 112.6	2 00	194 872	1 649
	33	9	3	1 016.03	.35	3	60 959.9	3 00	292 291	3 710
	34	9	4	1 046.82	.35	4	62 807.3	4 00	389 689	6 595
29	35	30.789	35	1 077.61	1847.36	35	64 654.6	5 00	487 059	10 305
	36	9	6	1 108.40	.36	6	66 502.0	6 00	584 394	14 838
	37	9	7	1 139.19	.37	7	68 349.3	7 00	681 687	20 194
	38	90	8	1 169.98	.37	8	70 196.7	8 00	778 931	26 374
	39	0	9	1 200.77	.38	9	72 044.1	9 00	876 120	33 376
29	40	30.790	40	1 231.56	1847.38	40	73 891.5	10 00	973 246	41 199
	41	0	1	1 262.34	.38	1	75 738.9	11 00	1 070 302	49 845
	42	0	2	1 293.13	.39	2	77 586.2	12 00	1 167 282	59 313
	43	0	3	1 323.92	.39	3	79 433.6	13 00	1 264 178	69 601
	44	0	4	1 354.71	.40	4	81 281.0	14 00	1 360 983	80 706
29	45	30.790	45	1 385.50	1847.40	45	83 128.4	15 00	1 457 691	92 631
	46	0	6	1 416.29	.41	6	84 975.8	16 00	1 554 295	105 375
	47	0	7	1 447.08	.41	7	86 823.2	17 00	1 650 787	118 935
	48	0	8	1 477.87	.42	8	88 670.7	18 00	1 747 161	133 311
	49	0	9	1 508.66	.42	9	90 518.1	19 00	1 843 410	148 502
29	50	30.790	50	1 539.44	1847.43	50	92 365.5	20 00	1 939 527	164 506
	51	1	1	1 570.23	.43	1	94 212.9	21 00	2 035 505	181 324
	52	1	2	1 601.02	.44	2	96 060.4	22 00	2 131 338	198 953
	53	1	3	1 631.81	.44	3	97 907.8	23 00	2 227 020	217 392
	54	1	4	1 662.60	.45	4	99 755.3	24 00	2 322 539	236 640
29	55	30.791	55	1 693.39	1847.45	55	101 602.7	25 00	2 417 893	256 695
	56	1	6	1 724.18	.46	6	103 450.2	26 00	2 513 074	277 558
	57	1	7	1 754.97	.46	7	105 297.6	27 00	2 608 075	299 224
	58	1	8	1 785.76	.46	8	107 145.1	28 00	2 702 890	321 694
	59	1	9	1 816.54	.47	9	108 992.5	29 00	2 797 511	344 964
	60	30.791	60	1 847.33	1847.47	60	110 840.0	30 00	2 891 931	369 036

Latitude 30° to 31°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
30 00	26.802	53.60	80.41	107.21	134.01	160.81	187.62	214.42	241.22	1608.1	3216.3	4824.4	6432.5	8040.7
1	.798	.59	.39	.19	3.99	.79	.59	.38	.18	7.9	5.7	3.6	1.4	39.3
2	.793	.58	.38	.17	.97	.76	.56	.35	.14	7.6	5.2	2.8	30.4	8.0
3	.789	.57	.37	.16	.94	.73	.52	.31	.10	7.3	4.6	2.0	29.3	6.6
4	.784	.56	.35	.14	.92	.71	.49	.28	.06	7.1	4.1	1.2	8.3	5.3
30 05	26.780	53.55	80.34	107.12	133.90	160.68	187.46	214.24	241.02	1606.8	3213.6	4820.4	6427.2	8033.9
6	.775	.55	.33	.10	.88	.65	.43	.20	0.98	6.5	3.0	19.6	6.1	2.6
7	.771	.54	.31	.08	.86	.62	.40	.17	.94	6.2	2.5	8.8	5.0	31.3
8	.766	.53	.30	.07	.83	.60	.36	.13	.90	6.0	2.0	7.9	4.0	29.9
9	.762	.52	.29	.05	.81	.57	.33	.10	.86	5.7	1.4	7.1	2.9	8.6
30 10	26.757	53.51	80.27	107.03	133.79	160.54	187.30	214.06	240.82	1605.4	3210.9	4816.3	6421.8	8027.2
11	.753	.50	.26	7.01	.77	.52	.27	4.02	.78	5.2	10.4	5.5	20.7	5.9
12	.748	.49	.24	6.99	.74	.49	.24	3.99	.74	4.9	09.8	4.7	19.6	4.5
13	.744	.48	.23	.98	.72	.46	.21	.95	.70	4.6	9.3	3.9	8.6	3.2
14	.739	.47	.22	.96	.70	.44	.18	.92	.65	4.4	8.7	3.1	7.5	1.8
30 15	26.735	53.46	80.20	106.94	133.68	160.41	187.14	213.88	240.61	1604.1	3208.2	4812.3	6416.4	8020.4
16	.730	.46	.19	.92	.65	.38	.11	.84	.57	3.8	7.6	1.5	5.3	19.1
17	.726	.45	.18	.90	.63	.35	.08	.81	.53	3.5	7.1	10.7	4.2	7.7
18	.721	.44	.16	.89	.61	.33	.05	.77	.49	3.3	6.6	09.8	3.1	6.4
19	.717	.43	.15	.87	.58	.30	7.02	.73	.45	3.0	6.0	9.0	2.0	5.0
30 20	26.712	53.42	80.14	106.85	133.56	160.27	186.99	213.70	240.41	1602.7	3205.5	4808.2	6410.9	8013.7
21	.708	.41	.12	.83	.54	.24	.96	.66	37	2.4	4.9	7.4	09.8	2.3
22	.703	.40	.11	.81	.52	.22	.93	.63	.33	2.2	4.4	6.6	8.7	11.0
23	.699	.39	.10	.80	.49	.19	.89	.59	.29	1.9	3.8	5.7	7.7	09.6
24	.694	.38	.08	.78	.47	.16	.86	.56	.25	1.6	3.3	4.9	6.6	8.2
30 25	26.690	53.37	80.07	106.76	133.45	160.14	186.83	213.52	240.21	1601.4	3202.8	4804.1	6405.5	8006.9
26	.685	.37	.06	.74	.43	.11	.80	.48	.16	1.1	2.2	3.3	4.4	5.5
27	.681	.36	.04	.72	.41	.08	.77	.45	.13	0.8	1.6	2.5	3.3	4.2
28	.676	.35	.03	.71	.38	.06	.73	.41	.08	0.6	1.1	1.6	2.3	2.8
29	.671	.34	.01	.69	.36	.03	.70	.38	.04	0.3	0.6	0.8	1.2	1.4
30 30	26.667	53.33	80.00	106.67	133.34	160.00	186.67	213.34	240.00	1600.0	3200.0	4800.0	6400.1	8000.1
31	.662	.32	79.99	.65	.32	59.97	.64	.30	39.96	599.7	199.5	799.2	399.0	7998.7
32	.658	.31	.97	.63	.29	.95	.61	.27	.92	9.5	8.9	8.4	7.9	7.3
33	.653	.30	.96	.62	.27	.92	.57	.23	.88	9.2	8.4	7.5	6.8	6.0
34	.649	.29	.95	.60	.25	.89	.54	.19	.84	8.9	7.8	6.7	5.7	4.6
30 35	26.644	53.29	79.93	106.58	133.22	159.86	186.51	213.15	239.80	1598.6	3197.3	4795.9	6394.6	7993.2
36	.640	.28	.92	.56	.20	.84	.48	.12	.76	8.4	6.8	5.1	3.5	1.9
37	.635	.27	.90	.54	.18	.81	.45	.08	.71	8.1	6.2	4.3	2.4	90.5
38	.630	.26	.89	.52	.16	.78	.41	.04	.67	7.8	5.7	3.4	1.3	89.1
39	.626	.25	.88	.51	.13	.76	.38	3.01	.63	7.6	5.1	2.6	90.2	7.8
30 40	26.621	53.24	79.86	106.49	133.11	159.73	186.35	212.97	239.59	1597.3	3194.6	4791.8	6389.1	7986.4
41	.617	.23	.85	.47	.09	.70	.32	.93	.55	7.0	4.0	1.0	8.0	5.0
42	.612	.22	.84	.45	.06	.67	.29	.90	.51	6.7	3.5	90.2	6.9	3.6
43	.608	.21	.82	.43	.04	.65	.25	.86	.47	6.5	2.9	89.3	5.8	2.3
44	.603	.20	.81	.41	.02	.62	.22	.82	.43	6.2	2.4	8.5	4.7	80.9
30 45	26.598	53.19	79.80	106.40	133.00	159.59	186.19	212.79	239.39	1595.9	3191.8	4787.7	6383.6	7979.5
46	.594	.19	.78	.38	2.97	.56	.16	.75	.35	5.6	1.3	6.9	2.5	8.2
47	.589	.18	.77	.36	.95	.53	.13	.71	.30	5.3	0.7	6.1	1.4	6.8
48	.585	.17	.75	.34	.93	.51	.09	.68	.26	5.1	90.2	5.2	80.3	5.4
49	.580	.16	.74	.32	.90	.48	.06	.64	.22	4.8	89.6	4.4	79.2	4.0
30 50	26.576	53.15	79.73	106.30	132.88	159.45	186.03	212.60	239.18	1594.5	3189.1	4783.6	6378.1	7972.7
51	.571	.14	.71	.28	.86	.42	6.00	.57	.14	4.2	8.5	2.8	7.0	71.3
52	.566	.13	.70	.26	.83	.40	5.97	.53	.10	4.0	8.0	2.0	5.9	69.9
53	.562	.12	.69	.25	.81	.37	.93	.49	.06	3.7	7.4	1.1	4.8	8.5
54	.557	.11	.67	.23	.79	.34	.90	.46	9.01	3.4	6.9	4780.3	3.7	7.1
30 55	26.553	53.10	79.66	106.21	132.76	159.32	185.87	212.42	238.97	1593.2	3186.3	4779.5	6372.6	7965.8
56	.548	.10	.64	.19	.74	.29	.84	.38	.93	2.9	5.8	8.7	1.5	4.4
57	.543	.09	.63	.17	.72	.26	.81	.35	.89	2.6	5.2	7.8	70.4	3.0
58	.539	.08	.62	.16	.70	.23	.77	.31	.85	2.3	4.6	7.0	69.3	1.6
59	.534	.07	.60	.14	.67	.21	.74	.27	.81	2.1	4.1	6.1	8.2	60.2
30 60	26.530	53.06	79.59	106.12	132.65	159.18	185.71	212.24	238.77	1591.8	3183.5	4775.3	6367.1	7958.9

Lat.		Latitude 30° to 31°—Meridional arcs.						Latitude 30°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 30° 30′		Value of 1′	Continuous sums of minutes from latitude 30° 00′		Longitude.	X	Y
°	′	Meters.	″	Meters.	Meters.	′	Meters.	° ′	Meters.	Meters.
30	00	30.791			1847.47					
	1	1	1	30.79	.48	1	1 847.5	0 1	1 608.1	0.1
	2	1	2	61.59	.48	2	3 695.0	2	3 216.3	0.5
	3	1	3	92.38	.49	3	5 542.4	3	4 824.4	1.1
	4	2	4	123.17	.49	4	7 389.9	4	6 432.6	1.9
30	05	30.792	5	153.97	1847.50	5	9 237.4	0 5	8 040.7	2.9
	6	2	6	184.76	.50	6	11 084.9	6	9 648.8	4.2
	7	2	7	215.56	.51	7	12 932.4	7	11 257.0	5.7
	8	2	8	246.35	.51	8	14 779.9	8	12 865.1	7.5
	9	2	9	277.14	.52	9	16 627.4	9	14 473.2	9.5
30	10	30.792	10	307.94	1847.52	10	18 475.0	0 10	16 081.4	11.7
	11	2	1	338.73	.53	1	20 322.5	15	24 122.0	26.3
	12	2	2	369.52	.53	2	22 170.0	20	32 162.7	46.8
	13	2	3	400.32	.54	3	24 017.5	25	40 203.3	73.1
	14	2	4	431.11	.54	4	25 865.1	30	48 244.0	105.3
30	15	30.792	15	461.90	1847.55	15	27 712.6	0 35	56 284.6	143.3
	16	3	6	492.70	.55	6	29 560.2	40	64 325.1	187.1
	17	3	7	523.49	.56	7	31 407.7	45	72 365.6	236.8
	18	3	8	554.29	.56	8	33 255.3	50	80 406.1	292.4
	19	3	9	585.08	.56	9	35 102.8	55	88 446.6	353.8
30	20	30.793	20	615.87	1847.57	20	36 950.4	1 00	96 487.0	421.0
	21	3	1	646.67	.57	1	38 798.0	05	104 527.3	494.1
	22	3	2	677.46	.58	2	40 645.5	10	112 567.6	573.0
	23	3	3	708.25	.58	3	42 493.1	15	120 607.9	657.8
	24	3	4	739.05	.59	4	44 340.7	20	128 648.0	748.4
30	25	30.793	25	769.84	1847.59	25	46 188.3	1 25	136 688.1	844.9
	26	3	6	800.63	.60	6	48 035.9	30	144 728.2	947.3
	27	3	7	831.43	.60	7	49 883.5	35	152 768.2	1 055.4
	28	3	8	862.22	.61	8	51 731.1	40	160 808.0	1 169.4
	29	4	9	893.01	.61	9	53 578.7	45	168 847.8	1 289.3
30	30	30.794	30	923.81	1847.62	30	55 426.3	1 50	176 887.5	1 415.0
	31	4	1	954.60	.62	1	57 273.9	55	184 927.1	1 546.6
	32	4	2	985.40	.63	2	59 121.6	2 00	192 967	1 684
	33	4	3	1 016.19	.63	3	60 969.2	3 00	289 432	3 789
	34	4	4	1 046.98	.64	4	62 816.8	4 00	385 875	6 735
30	35	30.794	35	1 077.78	1847.64	35	64 664.5	5 00	482 288	10 523
	36	4	6	1 108.57	.65	6	66 512.1	6 00	578 665	15 153
	37	4	7	1 139.36	.65	7	68 359.8	7 00	674 998	20 623
	38	4	8	1 170.16	.66	8	70 207.4	8 00	771 279	26 934
	39	4	9	1 200.95	.66	9	72 055.1	9 00	867 502	34 084
30	40	30.794	40	1 231.74	1847.66	40	73 902.7	10 00	963 658	42 074
	41	4	1	1 262.54	.67	1	75 750.4	11 00	1 059 741	50 903
	42	5	2	1 293.33	.67	2	77 598.1	12 00	1 155 744	60 570
	43	5	3	1 324.13	.68	3	79 445.8	13 00	1 251 658	71 074
	44	5	4	1 354.92	.68	4	81 293.4	14 00	1 347 477	82 415
30	45	30.795	45	1 385.71	1847.69	45	83 141.1	15 00	1 443 193	94 591
	46	5	6	1 416.51	.69	6	84 988.8	16 00	1 538 800	107 603
	47	5	7	1 447.30	.70	7	86 836.5	17 00	1 634 290	121 449
	48	5	8	1 478.09	.70	8	88 684.2	18 00	1 729 654	136 127
	49	5	9	1 508.89	.71	9	90 531.9	19 00	1 824 887	151 637
30	50	30.795	50	1 539.68	1847.71	50	92 379.6	20 00	1 919 982	167 977
	51	5	1	1 570.47	.72	1	94 227.4	21 00	2 014 930	185 147
	52	5	2	1 601.27	.72	2	96 075.1	22 00	2 109 725	203 143
	53	5	3	1 632.06	.73	3	97 922.8	23 00	2 204 359	221 966
	54	6	4	1 662.86	.73	4	99 770.5	24 00	2 298 825	241 616
30	55	30.796	55	1 693.65	1847.74	55	101 618.3	25 00	2 393 116	262 089
	56	6	6	1 724.44	.74	6	103 466.0	26 00	2 487 224	283 383
	57	6	7	1 755.24	.75	7	105 313.7	27 00	2 581 144	305 498
	58	6	8	1 786.03	.75	8	107 161.5	28 00	2 674 867	328 432
	59	6	9	1 816.82	.76	9	109 009.2	29 00	2 768 385	352 183
30	60	30.796	60	1 847.62	.76	60	110 857.0	30 00	2 861 694	376 749

Latitude 31° to 32°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
31 00	26.530	53.06	79.59	106.12	132.65	159.18	185.71	212.24	238.77	1591.8	3183.5	4775.3	6367.1	7958.9
1	.525	.05	.58	.10	.63	.15	.68	.20	.73	1.5	3.0	4.5	6.0	7.5
2	.520	.04	.56	.08	.60	.12	.64	.16	.68	1.2	2.4	3.6	4.9	6.1
3	.516	.03	.55	.06	.58	.09	.61	.13	.64	0.9	1.9	2.8	3.8	4.7
4	.511	.02	.53	.04	.56	.07	.58	.09	.60	0.7	1.3	1.9	2.6	3.3
31 05	26.506	53.02	79.52	106.03	132.53	159.04	185.55	212.05	238.56	1590.4	3180.8	4771.1	6361.5	7951.9
6	.502	.01	.51	6.01	.51	9.01	.51	2.01	.52	90.1	80.2	70.3	60.4	50.5
7	.497	3.00	.49	5.99	.49	8.98	.48	1.98	.48	89.8	79.7	69.5	59.3	49.1
8	.493	2.99	.48	.97	.47	.96	.45	.94	.43	9.6	9.1	8.6	8.2	7.8
9	.488	.98	.46	.95	.44	.93	.41	.90	.39	9.3	8.6	7.8	7.1	6.4
31 10	26.483	52.97	79.45	105.93	132.42	158.90	185.38	211.87	238.35	1589.0	3178.0	4767.0	6356.0	7945.0
11	.479	.96	.44	.91	.39	.87	.35	.83	.31	8.7	7.4	6.2	4.9	3.6
12	.474	.95	.42	.90	.37	.84	.32	.79	.27	8.4	6.9	5.3	3.8	2.2
13	.469	.94	.41	.88	.35	.82	.28	.75	.22	8.2	6.3	4.5	2.6	40.8
14	.465	.93	.39	.86	.32	.79	.25	.72	.18	7.9	5.8	3.6	1.5	39.4
31 15	26.460	52.92	79.38	105.84	132.30	158.76	185.22	211.68	238.14	1587.6	3175.2	4762.8	6350.4	7938.0
16	.455	.91	.37	.82	.28	.73	.19	.64	.10	7.3	4.6	2.0	49.3	6.6
17	.451	.90	.35	.80	.25	.70	.16	.61	.06	7.0	4.1	1.1	8.2	5.2
18	.446	.89	.34	.78	.23	.68	.12	.57	8.01	6.8	3.5	60.3	7.1	3.8
19	.441	.88	.32	.77	.21	.65	.09	.53	7.97	6.5	3.0	59.4	5.9	2.4
31 20	26.437	52.87	79.31	105.75	132.18	158.62	185.06	211.49	237.93	1586.2	3172.4	4758.6	6344.8	7931.0
21	.432	.86	.30	.73	.16	.59	5.03	.46	.89	5.9	1.8	7.8	3.7	29.6
22	.427	.85	.28	.71	.13	.56	4.99	.42	.85	5.6	1.3	6.9	2.6	8.2
23	.423	.84	.27	.69	.11	.54	.96	.38	.80	5.4	0.7	6.1	1.5	6.8
24	.418	.83	.25	.67	.09	.51	.93	.34	.76	5.1	70.2	5.2	40.3	5.4
31 25	26.413	52.83	79.24	105.65	132.06	158.48	184.89	211.31	237.72	1584.8	3169.6	4754.4	6339.2	7924.0
26	.409	.82	.23	.63	.04	.45	.86	.27	.68	4.5	9.0	3.6	8.1	2.6
27	.404	.81	.21	.62	.02	.42	.83	.23	.64	4.2	8.5	2.7	7.0	21.2
28	.399	.80	.20	.60	2.00	.40	.80	.20	.59	4.0	7.9	1.9	5.9	19.8
29	.395	.79	.18	.58	1.97	.37	.76	.16	.55	3.7	7.4	1.0	4.7	8.4
31 30	26.390	52.78	79.17	105.56	131.95	158.34	184.73	211.12	237.51	1583.4	3166.8	4750.2	6333.6	7917.0
31	.385	.77	.16	.54	.93	.31	.70	.08	.47	3.1	6.2	49.4	2.5	5.6
32	.381	.76	.14	.52	.90	.28	.66	.05	.43	2.8	5.7	8.5	1.4	4.2
33	.376	.75	.13	.50	.88	.26	.63	1.01	.38	2.6	5.1	7.7	30.2	2.8
34	.371	.74	.11	.49	.86	.23	.60	0.97	.34	2.3	4.6	6.8	29.1	1.4
31 35	26.367	52.74	79.10	105.47	131.84	158.20	184.56	210.93	237.30	1582.0	3164.0	4746.0	6328.0	7910.0
36	.362	.73	.09	.45	.81	.17	.53	.90	.26	1.7	3.4	5.2	6.9	08.6
37	.357	.72	.07	.43	.79	.14	.50	.86	.22	1.4	2.9	4.3	5.7	7.2
38	.353	.71	.06	.41	.77	.12	.47	.82	.17	1.2	2.3	3.5	4.6	5.8
39	.348	.70	.04	.39	.74	.09	.43	.78	.13	0.9	1.8	2.6	3.5	4.4
31 40	26.343	52.69	79.03	105.37	131.72	158.06	184.40	210.75	237.09	1580.6	3161.2	4741.8	6322.4	7903.0
41	.338	.68	.02	.35	.69	.03	.37	.71	.05	0.3	0.6	0.9	1.2	1.5
42	.334	.67	9.00	.33	.67	8.00	.33	.67	7.00	80.0	60.0	40.1	20.1	900.1
43	.329	.66	8.99	.32	.65	7.98	.30	.63	6.96	79.8	59.5	39.2	19.0	898.7
44	.324	.65	.97	.30	.62	.95	.27	.59	.92	9.5	8.9	8.4	7.8	7.3
31 45	26.320	52.64	78.96	105.28	131.60	157.92	184.24	210.56	236.87	1579.2	3158.3	4737.5	6316.7	7895.9
46	.315	.63	.95	.26	.58	.89	.20	.52	.83	8.9	7.8	6.7	5.6	4.5
47	.310	.62	.93	.24	.55	.86	.17	.48	.79	8.6	7.2	5.8	4.4	3.0
48	.305	.61	.92	.22	.53	.84	.14	.44	.75	8.4	6.6	5.0	3.3	1.6
49	.301	.60	.90	.20	.50	.80	.11	.41	.70	8.0	6.1	4.1	2.2	90.2
31 50	26.296	52.59	78.89	105.18	131.48	157.78	184.07	210.37	236.66	1577.8	3155.5	4733.3	6311.0	7888.8
51	.291	.58	.87	.16	.46	.75	.04	.33	.62	7.5	4.9	2.4	09.9	7.4
52	.287	.57	.86	.15	.43	.72	4.00	.29	.58	7.2	4.4	1.6	8.8	6.0
53	.282	.56	.85	.13	.41	.69	3.97	.25	.53	6.9	3.8	30.7	7.6	4.5
54	.277	.55	.83	.11	.38	.66	.94	.22	.49	6.6	3.3	29.9	6.5	83.1
31 55	26.272	52.55	78.82	105.09	131.36	157.63	183.90	210.18	236.45	1576.3	3152.7	4729.0	6305.4	7881.7
56	.268	.54	.80	.07	.34	.61	.87	.14	.41	6.1	2.1	8.2	4.2	80.3
57	.263	.53	.79	.05	.31	.58	.84	.10	.37	5.8	1.5	7.3	3.1	78.9
58	.258	.52	.77	.03	.29	.55	.81	.07	.32	5.5	1.0	6.5	2.0	7.4
59	.253	.51	.76	5.01	.26	.52	.77	10.03	.28	5.2	50.4	5.6	300.8	6.0
31 60	26.249	52.50	78.75	104.99	131.24	157.49	183.74	209.99	236.24	1574.9	3149.8	4724.8	6299.7	7874.6

Lat.		Latitude 31° to 32°—Meridional arcs.						Latitude 31°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 31° 30′		Value of 1′	Continuous sums of minutes from latitude 31° 00′		Longitude.	X	Y
°	′	Meters.	″	Meters.	Meters.	′	Meters.	° ′	Meters.	Meters.
31	00	30.796			1847.76					
	1	6	1	30.80	.77	1	1 847.8	0 1	1 591.8	0.1
	2	6	2	61.60	.77	2	3 695.5	2	3 183.5	0.5
	3	6	3	92.40	.78	3	5 543.3	3	4 775.3	1.1
	4	6	4	123.19	.78	4	7 391.1	4	6 367.1	1.9
31	05	30.796	5	153.99	1847.79	5	9 238.9	0 5	7 958.9	3.0
	6	7	6	184.79	.79	6	11 086.7	6	9 550.6	4.3
	7	7	7	215.59	.80	7	12 934.4	7	11 142.4	5.8
	8	7	8	246.39	.80	8	14 782.2	8	12 734.2	7.6
	9	7	9	277.19	.80	9	16 630.0	9	14 325.9	9.7
31	10	30.797	10	307.98	1847.81	10	18 477.9	0 10	15 917.7	11.9
	11	7	1	338.78	.81	1	20 325.7	15	23 876.5	26.8
	12	7	2	369.58	.82	2	22 173.5	20	31 835.4	47.7
	13	7	3	400.38	.82	3	24 021.3	25	39 794.2	74.5
	14	7	4	431.18	.83	4	25 869.1	30	47 753.0	107.3
31	15	30.797	15	461.98	1847.83	15	27 717.0	0 35	55 711.7	146.1
	16	7	6	492.78	.84	6	29 564.8	40	63 670.4	190.8
	17	7	7	523.57	.84	7	31 412.6	45	71 629.2	241.5
	18	7	8	554.37	.85	8	33 260.5	50	79 587.8	298.1
	19	8	9	585.17	.85	9	35 108.3	55	87 546.4	360.7
31	20	30.798	20	615.97	1847.86	20	36 956.2	1 00	95 505.0	429.3
	21	8	1	646.77	.86	1	38 804.0	05	103 463.5	503.8
	22	8	2	677.57	.87	2	40 651.9	10	111 421.9	584.3
	23	8	3	708.36	.87	3	42 499.8	15	119 380.3	670.7
	24	8	4	739.16	.88	4	44 347.7	20	127 338.6	763.1
31	25	30.798	25	769.96	1847.88	25	46 195.5	1 25	135 296.9	861.5
	26	8	6	800.76	.89	6	48 043.4	30	143 255.1	965.8
	27	8	7	831.56	.89	7	49 891.3	35	151 213.1	1 076.1
	28	8	8	862.36	.90	8	51 739.2	40	159 171.1	1 192.4
	29	8	9	893.15	.90	9	53 587.1	45	167 129.0	1 314.6
31	30	30.798	30	923.95	1847.91	30	55 435.0	1 50	175 086.8	1 442.8
	31	9	1	954.75	.91	1	57 282.9	55	183 044.6	1 576.9
	32	9	2	985.55	.92	2	59 130.8	2 00	191 002	1 717
	33	9	3	1 016.35	.92	3	60 978.8	3 00	286 484	3 863
	34	9	4	1 047.15	.93	4	62 826.7	4 00	381 943	6 867
31	35	30.799	35	1 077.95	1847.93	35	64 674.6	5 00	477 371	10 729
	36	9	6	1 108.74	.94	6	66 522.5	6 00	572 760	15 450
	37	9	7	1 139.54	.94	7	68 370.5	7 00	668 103	21 027
	38	9	8	1 170.34	.95	8	70 218.4	8 00	763 392	27 461
	39	9	9	1 201.14	.95	9	72 066.4	9 00	858 619	34 751
31	40	30.799	40	1 231.94	1847.96	40	73 914.3	10 00	953 777	42 897
	41	9	1	1 262.74	.96	1	75 762.3	11 00	1 048 858	51 898
	42	799	2	1 293.53	.97	2	77 610.2	12 00	1 143 854	61 753
	43	800	3	1 324.33	.97	3	79 458.2	13 00	1 238 758	72 462
	44	0	4	1 355.13	.98	4	81 306.2	14 00	1 333 561	84 024
31	45	30.800	45	1 385.93	1847.98	45	83 154.2	15 00	1 428 257	96 437
	46	0	6	1 416.73	.98	6	85 002.1	16 00	1 522 837	109 701
	47	0	7	1 447.53	.99	7	86 850.1	17 00	1 617 294	123 815
	48	0	8	1 478.33	7.99	8	88 698.1	18 00	1 711 621	138 777
	49	0	9	1 509.12	1848.00	9	90 546.1	19 00	1 805 810	154 586
31	50	30.800	50	1 539.92	1848.00	50	92 394.1	20 00	1 899 852	171 241
	51	0	1	1 570.72	.01	1	94 242.1	21 00	1 993 740	188 741
	52	0	2	1 601.52	.01	2	96 090.1	22 00	2 087 468	207 085
	53	0	3	1 632.32	.02	3	97 938.2	23 00	2 181 027	226 270
	54	0	4	1 663.12	.02	4	99 786.2	24 00	2 274 411	246 295
31	55	30.800	55	1 693.91	1848.03	55	101 634.2	25 00	2 367 610	267 159
	56	1	6	1 724.71	.03	6	103 482.2	26 00	2 460 618	288 860
	57	1	7	1 755.51	.04	7	105 330.3	27 00	2 553 427	311 396
	58	1	8	1 786.31	.04	8	107 178.3	28 00	2 646 029	334 765
	59	1	9	1 817.11	.05	9	109 026.4	29 00	2 738 418	358 966
31	60	30.801	60	1 847.91	1848.05	60	110 874.4	30 00	2 830 585	383 997

Latitude 32° to 33°—Arcs of the Parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
32 00	26.249	52.50	78.75	104.99	131.24	157.49	183.74	209.99	236.24	1574.9	3149.8	4724.8	6299.7	7874.6
1	.244	.49	.73	.98	.22	.46	.71	.95	.20	4.6	9.3	3.9	8.5	3.2
2	.239	.48	.72	.96	.19	.43	.67	.91	.15	4.3	8.7	3.1	7.4	1.7
3	.234	.47	.70	.94	.17	.41	.64	.87	.11	4.1	8.1	2.2	6.2	70.3
4	.230	.46	.69	.92	.15	.38	.61	.84	.07	3.8	7.6	1.4	5.1	68.9
32 05	26.225	52.45	78.67	104.90	131.12	157.35	183.57	209.80	236.02	1573.5	3147.0	4720.5	6294.0	7867.4
6	.220	.44	.66	.88	.10	.32	.54	.76	5.98	3.2	6.4	19.6	2.8	6.0
7	.215	.43	.65	.86	.08	.29	.51	.72	.94	2.9	5.8	8.8	1.7	4.6
8	.211	.42	.63	.84	.06	.26	.48	.68	.90	2.6	5.3	7.9	90.5	3.2
9	.206	.41	.62	.82	.03	.23	.44	.65	.85	2.3	4.7	7.1	89.4	1.7
32 10	26.201	52.40	78.60	104.80	131.01	157.21	183.41	209.61	235.81	1572.1	3144.1	4716.2	6288.3	7860.3
11	.196	.39	.59	.79	0.99	.18	.38	.57	.77	1.8	3.6	5.3	7.1	58.9
12	.191	.38	.57	.77	.96	.15	.34	.53	.72	1.5	3.0	4.5	6.0	7.4
13	.187	.37	.56	.75	.94	.12	.31	.49	.68	1.2	2.4	3.6	4.8	6.0
14	.182	.36	.55	.73	.91	.09	.27	.46	.64	0.9	1.9	2.8	3.7	4.6
32 15	26.177	52.35	78.53	104.71	130.89	157.06	183.24	209.42	235.59	1570.6	3141.3	4711.9	6282.5	7853.1
16	.172	.34	.52	.69	.87	.03	.21	.38	.55	0.3	0.7	1.0	1.4	1.7
17	.168	.34	.50	.67	.84	7.01	.17	.34	.51	70.1	40.1	10.2	80.2	50.3
18	.163	.33	.49	.65	.82	6.98	.14	.30	.47	69.8	39.5	09.3	79.1	48.8
19	.158	.32	.47	.63	.79	.95	.10	.26	.42	9.5	9.0	8.5	7.9	7.4
32 20	26.153	52.31	78.46	104.61	130.77	156.92	183.07	209.23	235.38	1569.2	3138.4	4707.6	6276.8	7846.0
21	.148	.30	.45	.59	.75	.89	.04	.19	.34	8.9	7.8	6.7	5.6	4.5
22	.144	.29	.43	.57	.72	.86	3.00	.15	.29	8.6	7.2	5.9	4.5	3.1
23	.139	.28	.42	.56	.70	.83	2.97	.11	.25	8.3	6.7	5.0	3.3	1.6
24	.134	.27	.40	.54	.67	.80	.94	.07	.21	8.0	6.1	4.1	2.2	40.2
32 25	26.129	52.26	78.39	104.52	130.65	156.78	182.90	209.03	235.16	1567.8	3135.5	4703.3	6271.0	7838.8
26	.124	.25	.37	.50	.63	.75	.87	9.00	.12	7.5	4.9	2.4	69.9	7.3
27	.120	.24	.36	.48	.60	.72	.84	8.96	.08	7.2	4.3	1.5	68.7	5.9
28	.115	.23	.34	.46	.58	.69	.81	.92	5.04	6.9	3.8	700.7	7.6	4.4
29	.110	.22	.33	.44	.55	.66	.77	.88	4.99	6.6	3.2	699.8	6.4	3.0
32 30	26.105	52.21	78.32	104.42	130.53	156.63	182.74	208.84	234.95	1566.3	3132.6	4698.9	6265.3	7831.6
31	.100	.20	.30	.40	.51	.60	.70	.80	.90	6.0	2.0	8.0	4.1	30.1
32	.096	.19	.29	.38	.48	.57	.67	.76	.86	5.7	1.5	7.2	2.9	28.7
33	.091	.18	.27	.36	.45	.54	.64	.73	.82	5.4	0.9	6.3	1.8	7.2
34	.086	.17	.26	.34	.43	.52	.60	.69	.77	5.2	30.3	5.5	60.6	5.8
32 35	26.081	52.16	78.24	104.32	130.41	156.49	182.57	208.65	234.73	1564.9	3129.7	4694.6	6259.5	7824.3
36	.076	.15	.23	.30	.39	.46	.54	.61	.69	4.6	9.1	3.7	8.3	2.9
37	.071	.14	.21	.29	.36	.43	.50	.57	.64	4.3	8.6	2.9	7.1	1.4
38	.067	.13	.20	.27	.34	.40	.47	.53	.60	4.0	8.0	2.0	6.0	20.0
39	.062	.12	.18	.25	.31	.37	.43	.49	.55	3.7	7.4	1.1	4.8	18.5
32 40	26.057	52.11	78.17	104.23	130.29	156.34	182.40	208.46	234.51	1563.4	3126.8	4690.3	6253.7	7817.1
41	.052	.10	.16	.21	.26	.31	.37	.42	.47	3.1	6.2	89.4	2.5	5.6
42	.047	.09	.14	.19	.24	.28	.33	.38	.42	2.8	5.7	8.5	1.3	4.2
43	.042	.08	.13	.17	.22	.25	.30	.34	.38	2.5	5.1	7.7	50.2	2.7
44	.038	.08	.11	.15	.19	.23	.26	.30	.34	2.3	4.5	6.8	49.0	11.3
32 45	26.033	52.07	78.10	104.13	130.17	156.20	182.23	208.26	234.29	1562.0	3123.9	4685.9	6247.9	7809.8
46	.028	.06	.08	.11	.14	.17	.20	.22	.25	1.7	3.3	5.0	6.7	8.4
47	.023	.05	.07	.09	.12	.14	.16	.18	.21	1.4	2.7	4.1	5.5	6.9
48	.018	.04	.05	.07	.09	.11	.13	.15	.17	1.1	2.2	3.3	4.4	5.4
49	.013	.03	.04	.05	.07	.08	.09	.11	.12	0.8	1.6	2.4	3.2	4.0
32 50	26.008	52.02	78.03	104.03	130.04	156.05	182.06	208.07	234.08	1560.5	3121.0	4681.5	6242.0	7802.5
51	.004	.01	.01	4.01	30.02	6.02	2.03	8.03	4.03	60.2	20.4	80.6	40.9	801.1
52	5.999	2.00	8.00	3.99	29.99	5.99	1.99	7.99	3.99	59.9	19.8	79.7	39.7	799.6
53	.994	1.99	7.98	.98	.97	.96	.96	.95	.95	9.6	9.3	8.9	8.5	8.2
54	.989	.98	.97	.96	.94	.93	.92	.91	.90	9.3	8.7	8.0	7.4	6.7
32 55	25.984	51.97	77.95	103.94	129.92	155.90	181.89	207.87	233.86	1559.0	3118.1	4677.1	6236.2	7795.2
56	.979	.96	.94	.92	.90	.88	.86	.83	.81	8.8	7.5	6.2	5.0	3.8
57	.974	.95	.92	.90	.87	.85	.82	.79	.77	8.5	6.9	5.4	3.8	2.3
58	.970	.94	.91	.88	.85	.82	.79	.76	.73	8.2	6.4	4.5	2.7	90.9
59	.965	.93	.89	.86	.82	.79	.75	.72	.68	7.9	5.8	3.7	1.5	89.4
32 60	25.960	51.92	77.88	103.84	129.80	155.76	181.72	207.68	233.64	1557.6	3115.2	4672.8	6230.3	7787.9

Lat.		Latitude 32° to 33°—Meridional arcs.						Latitude 32°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 32° 30′		Value of 1′	Continuous sums of minutes from latitude 32° 00′		Longitude.	X	Y
°	′	*Meters.*	″	*Meters.*	*Meters.*	′	*Meters.*	° ′	*Meters.*	*Meters.*
32	00	30.801			1848.05					
	1	1	1	30.80	.06	1	1 848.1	0 1	1 574.9	0.1
	2	1	2	61.61	.06	2	3 696.1	2	3 149.8	0.5
	3	1	3	92.41	.07	3	5 544.2	3	4 724.8	1.1
	4	1	4	123.21	.07	4	7 392.3	4	6 299.7	1.9
32	05	30.801	5	154.02	1848.08	5	9 240.3	0 5	7 874.6	3.0
	6	1	6	184.82	.08	6	11 088.4	6	9 449.5	4.4
	7	1	7	215.62	.09	7	12 936.5	7	11 024.4	6.0
	8	2	8	246.43	.09	8	14 784.6	8	12 599.4	7.8
	9	2	9	277.23	.10	9	16 632.7	9	14 174.3	9.8
32	10	30.802	10	308.03	1848.10	10	18 480.8	0 10	15 749.2	12.1
	11	2	1	338.84	.11	1	20 328.9	15	23 623.8	27.3
	12	2	2	369.64	.11	2	22 177.0	20	31 498.3	48.6
	13	2	3	400.44	.12	3	24 025.1	25	39 372.9	75.9
	14	2	4	431.25	.12	4	25 873.2	30	47 247.4	109.3
32	15	30.802	15	462.05	1848.13	15	27 721.4	0 35	55 121.9	148.7
	16	2	6	492.85	.13	6	29 569.5	40	62 996.4	194.2
	17	2	7	523.66	.14	7	31 417.6	45	70 870.8	245.8
	18	2	8	554.46	.14	8	33 265.8	50	78 745.2	303.5
	19	2	9	585.26	.15	9	35 113.9	55	86 619.5	367.2
32	20	30.803	20	616.07	1848.15	20	36 962.1	1 00	94 493.8	437.0
	21	3	1	646.87	.16	1	38 810.2	05	102 368.0	512.8
	22	3	2	677.67	.16	2	40 658.4	10	110 242.2	594.8
	23	3	3	708.48	.17	3	42 506.6	15	118 116.3	682.8
	24	3	4	739.28	.17	4	44 354.7	20	125 990.3	776.9
32	25	30.803	25	770.08	1848.18	25	46 202.9	1 25	133 864.3	877.0
	26	3	6	800.89	.18	6	48 051.1	30	141 738.2	983.2
	27	3	7	831.69	.19	7	49 899.3	35	149 612.0	1 095.5
	28	3	8	862.49	.19	8	51 747.5	40	157 485.7	1 213.8
	29	3	9	893.30	.20	9	53 595.6	45	165 359.3	1 338.2
32	30	30.803	30	924.10	1848.20	30	55 443.8	1 50	173 232.8	1 468.7
	31	3	1	954.90	.21	1	57 292.0	55	181 106.2	1 605.3
	32	4	2	985.71	.21	2	59 140.3	2 00	188 980	1 748
	33	4	3	1 016.51	.22	3	60 988.5	3 00	283 449	3 933
	34	4	4	1 047.31	.22	4	62 836.7	4 00	377 894	6 991
32	35	30.804	35	1 078.12	1848.23	35	64 684.9	5 00	472 307	10 922
	36	4	6	1 108.92	.23	6	66 533.1	6 00	566 680	15 727
	37	4	7	1 139.72	.24	7	68 381.4	7 00	661 004	21 404
	38	4	8	1 170.53	.24	8	70 229.6	8 00	755 272	27 954
	39	4	9	1 201.33	.25	9	72 077.8	9 00	849 475	35 375
32	40	30.804	40	1 232.13	1848.25	40	73 926.1	10 00	943 605	43 667
	41	4	1	1 262.94	.26	1	75 774.4	11 00	1 037 655	52 829
	42	4	2	1 293.74	.26	2	77 622.6	12 00	1 131 616	62 861
	43	4	3	1 324.54	.27	3	79 470.9	13 00	1 225 480	73 761
	44	5	4	1 355.35	.27	4	81 319.1	14 00	1 319 239	85 529
32	45	30.805	45	1 386.15	1848.28	45	83 167.4	15 00	1 412 885	98 164
	46	5	6	1 416.95	.28	6	85 015.7	16 00	1 506 411	111 664
	47	5	7	1 447.76	.29	7	86 864.0	17 00	1 599 808	126 029
	48	5	8	1 478.56	.29	8	88 712.3	18 00	1 693 067	141 256
	49	5	9	1 509.36	.30	9	90 560.5	19 00	1 786 182	157 346
32	50	30.805	50	1 540.17	1848.30	50	92 408.8	20 00	1 879 144	174 296
	51	5	1	1 570.97	.31	1	94 257.1	21 00	1 971 946	192 105
	52	5	2	1 601.77	.31	2	96 105.5	22 00	2 064 579	210 772
	53	5	3	1 632.58	.32	3	97 953.8	23 00	2 157 035	230 295
	54	5	4	1 663.38	.32	4	99 802.1	24 00	2 249 305	250 672
32	55	30.805	55	1 694.18	1848.33	55	101 650.4	25 00	2 341 385	271 901
	56	6	6	1 724.99	.33	6	103 498.7	26 00	2 433 264	293 981
	57	6	7	1 755.79	.34	7	105 347.1	27 00	2 524 935	316 910
	58	6	8	1 786.59	.34	8	107 195.4	28 00	2 616 390	340 686
	59	6	9	1 817.40	.35	9	109 043.8	29 00	2 707 621	365 307
32	60	30.806	60	1 848.20	1848.35	60	110 892.1	30 00	2 798 621	390 770

Latitude 33° to 34°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
33 00	25.960	51.92	77.88	103.84	129.80	155.76	181.72	207.68	233.64	1557.6	3115.2	4672.8	6230.3	7787.9
1	.955	.91	.87	.82	.78	.73	.69	.64	.60	7.3	4.6	1.9	29.2	6.5
2	.950	.90	.85	.80	.75	.70	.65	.60	.55	7.0	4.0	1.0	8.0	5.0
3	.945	.89	.84	.78	.73	.67	.62	.56	.51	6.7	3.4	70.1	6.8	3.5
4	.940	.88	.82	.76	.70	.64	.58	.52	.46	6.4	2.8	69.3	5.6	2.1
33 05	25.935	51.87	77.81	103.74	129.68	155.61	181.55	207.48	233.42	1556.1	3112.2	4668.4	6224.5	7780.6
6	.930	.86	.79	.72	.65	.58	.51	.44	.38	5.8	1.6	7.5	3.3	79.1
7	.926	.85	.78	.70	.63	.55	.48	.40	.33	5.5	1.1	6.6	2.1	7.7
8	.921	.84	.76	.68	.60	.53	.45	.37	.29	5.3	10.5	5.7	21.0	6.2
9	.916	.83	.75	.66	.58	.50	.41	.33	.24	5.0	09.9	4.8	19.8	4.7
33 10	25.911	51.82	77.73	103.64	129.55	155.47	181.38	207.29	233.20	1554.7	3109.3	4664.0	6218.6	7773.3
11	.906	.81	.72	.62	.53	.44	.35	.25	.16	4.4	8.7	3.1	7.4	1.8
12	.901	.80	.70	.60	.50	.41	.31	.21	.11	4.1	8.1	2.2	6.2	70.3
13	.896	.79	.69	.58	.48	.38	.28	.17	.07	3.8	7.5	1.3	5.1	68.8
14	.891	.78	.67	.57	.46	.35	.24	.13	3.02	3.5	7.0	60.4	3.9	7.4
33 15	25.886	51.77	77.66	103.55	129.43	155.32	181.21	207.09	232.98	1553.2	3106.4	4659.5	6212.7	7765.9
16	.881	.76	.64	.53	.41	.29	.17	.05	.93	2.9	5.8	8.6	1.5	4.4
17	.876	.75	.63	.51	.38	.26	.14	7.01	.89	2.6	5.2	7.7	10.4	2.9
18	.872	.74	.62	.49	.36	.23	.10	6.97	.85	2.3	4.6	6.9	09.2	1.5
19	.867	.73	.60	.47	.33	.20	.07	.93	.80	2.0	4.0	6.0	8.0	60.0
33 20	25.862	51.72	77.59	103.45	129.31	155.17	181.03	206.89	232.76	1551.7	3103.4	4655.1	6206.8	7758.5
21	.857	.71	.57	.43	.29	.14	1.00	.85	.71	1.4	2.8	4.2	5.6	7.0
22	.852	.70	.56	.41	.26	.11	0.96	.81	.67	1.1	2.2	3.3	4.4	5.6
23	.847	.69	.54	.39	.24	.08	.93	.78	.63	0.8	1.6	2.5	3.3	4.1
24	.842	.68	.53	.37	.21	.05	.89	.74	.58	0.5	1.0	1.6	2.1	2.6
33 25	25.837	51.67	77.51	103.35	129.19	155.02	180.86	206.70	232.54	1550.2	3100.4	4650.7	6200.9	7751.1
26	.832	.66	.50	.33	.16	4.99	.82	.66	.49	49.9	099.8	49.8	199.7	49.6
27	.827	.65	.48	.31	.14	.96	.79	.62	.45	9.6	9.3	8.9	8.5	8.2
28	.822	.64	.47	.29	.11	.93	.76	.58	.40	9.3	8.7	8.0	7.3	6.7
29	.817	.63	.45	.27	.09	.90	.72	.54	.36	9.0	8.1	7.1	6.2	5.2
33 30	25.812	51.62	77.44	103.25	129.06	154.87	180.69	206.50	232.31	1548.7	3097.5	4646.2	6195.0	7743.7
31	.807	.61	.42	.23	.04	.84	.65	.46	.27	8.4	6.9	5.3	3.8	2.2
32	.802	.60	.41	.21	9.01	.81	.62	.42	.22	8.1	6.3	4.4	2.6	40.7
33	.797	.59	.39	.19	8.99	.78	.58	.38	.18	7.8	5.7	3.5	1.4	39.2
34	.793	.59	.38	.17	.96	.76	.55	.34	.13	7.6	5.1	2.7	90.2	7.8
33 35	25.788	51.58	77.36	103.15	128.94	154.73	180.52	206.30	232.09	1547.3	3094.5	4641.8	6189.0	7736.3
36	.783	.57	.35	.13	.91	.70	.48	.26	.05	7.0	3.9	0.9	7.8	4.8
37	.778	.56	.33	.11	.89	.67	.45	.22	2.00	6.7	3.3	40.0	6.6	3.3
38	.773	.55	.32	.09	.86	.64	.41	.18	1.96	6.4	2.7	39.1	5.5	1.8
39	.768	.54	.30	.07	.84	.61	.38	.14	.91	6.1	2.1	8.2	4.3	30.3
33 40	25.763	51.53	77.29	103.05	128.81	154.58	180.34	206.10	231.87	1545.8	3091.5	4637.3	6183.1	7728.8
41	.758	.52	.27	.03	.79	.55	.31	.06	.82	5.5	0.9	6.4	1.9	7.3
42	.753	.51	.26	3.01	.76	.52	.27	6.02	.78	5.2	90.3	5.5	80.7	5.9
43	.748	.50	.24	2.99	.74	.49	.24	5.98	.73	4.9	89.8	4.6	79.5	4.4
44	.743	.49	.23	.97	.71	.46	.20	.94	.69	4.6	9.2	3.7	8.3	2.9
33 45	25.738	51.48	77.21	102.95	128.69	154.43	180.17	205.90	231.64	1544.3	3088.6	4632.8	6177.1	7721.4
46	.733	.47	.20	.93	.67	.40	.13	.86	.60	4.0	8.0	1.9	5.9	19.9
47	.728	.46	.18	.91	.64	.37	.10	.82	.55	3.7	7.4	1.0	4.7	8.4
48	.723	.45	.17	.89	.62	.34	.06	.78	.51	3.4	6.8	30.1	3.5	6.9
49	.718	.44	.15	.87	.59	.31	80.03	.74	.46	3.1	6.2	29.2	2.3	5.4
33 50	25.713	51.43	77.14	102.85	128.57	154.28	179.99	205.70	231.42	1542.8	3085.6	4628.3	6171.1	7713.9
51	.708	.42	.12	.83	.55	.25	.96	.66	.37	2.5	5.0	7.4	69.9	2.4
52	.703	.41	.11	.81	.52	.22	.92	.62	.33	2.2	4.4	6.5	8.7	10.9
53	.698	.40	.09	.79	.49	.19	.89	.58	.28	1.9	3.8	5.6	7.5	09.4
54	.693	.39	.08	.77	.47	.16	.85	.54	.24	1.6	3.2	4.7	6.3	7.9
33 55	25.688	51.38	77.06	102.75	128.44	154.13	179.82	205.50	231.19	1541.3	3082.6	4623.8	6165.1	7706.4
56	.683	.37	.05	.73	.42	.10	.78	.46	.15	1.0	2.0	2.9	3.9	4.9
57	.678	.36	.03	.71	.39	.07	.75	.42	.10	0.7	1.4	2.0	2.7	3.4
58	.673	.35	.02	.69	.37	.04	.71	.38	.06	0.4	0.8	1.1	1.5	1.9
59	.668	.34	7.00	.67	.34	4.01	.68	.34	1.01	40.1	80.2	20.2	60.3	700.4
33 60	25.663	51.33	76.99	102.65	128.32	153.98	179.64	205.30	230.97	1539.8	3079.6	4619.3	6159.1	7698.9

Lat.		Latitude 33° to 34°—Meridional arcs.						Latitude 33°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 33° 30′		Value of 1′	Continuous sums of minutes from latitude 33° 00′		Longitude.	X	Y
°	′	*Meters.*	″	*Meters.*	*Meters.*	′	*Meters.*	° ′	*Meters.*	*Meters.*
33	00	30.806			1848.35					
	1	6	1	30.81	.36	1	1 848.4	0 1	1 557.6	0.1
	2	6	2	61.62	.36	2	3 696.7	2	3 115.2	0.5
	3	6	3	92.43	.37	3	5 545.1	3	4 672.8	1.1
	4	6	4	123.23	.37	4	7 393.4	4	6 230.3	2.0
33	05	30.806	5	154.04	1848.38	5	9 241.8	0 5	7 787.9	3.1
	6	6	6	184.85	.38	6	11 090.2	6	9 345.5	4.4
	7	6	7	215.66	.39	7	12 938.6	7	10 903.1	6.0
	8	7	8	246.47	.39	8	14 787.0	8	12 460.7	7.9
	9	7	9	277.28	.40	9	16 635.4	9	14 018.3	10.0
33	10	30.807	10	308.08	1848.40	10	18 483.8	0 10	15 575.9	12.3
	11	7	1	338.89	.41	1	20 332.2	15	23 363.8	27.8
	12	7	2	369.70	.41	2	22 180.6	20	31 151.7	49.4
	13	7	3	400.51	.42	3	24 029.0	25	38 939.6	77.1
	14	7	4	431.32	.42	4	25 877.4	30	46 727.4	111.0
33	15	30.807	15	462.13	1848.43	15	27 725.8	0 35	54 515.3	151.1
	16	7	6	492.93	.43	6	29 574.2	40	62 303.1	197.4
	17	7	7	523.74	.44	7	31 422.7	45	70 090.8	249.8
	18	7	8	554.55	.44	8	33 271.1	50	77 878.6	308.4
	19	7	9	585.36	.45	9	35 119.6	55	85 666.2	373.2
33	20	30.808	20	616.17	1848.45	20	36 968.0	1 00	93 453.8	444.2
	21	8	1	646.98	.46	1	38 816.5	05	101 241.4	521.3
	22	8	2	677.78	.46	2	40 664.9	10	109 028.9	604.6
	23	8	3	708.59	.47	3	42 513.4	15	116 816.3	694.0
	24	8	4	739.40	.47	4	44 361.9	20	124 603.7	789.6
33	25	30.808	25	770.21	1848.48	25	46 210.3	1 25	132 390.9	891.4
	26	8	6	801.02	.48	6	48 058.8	30	140 178.1	999.4
	27	8	7	831.83	.49	7	49 907.3	35	147 965.2	1 113.5
	28	8	8	862.63	.49	8	51 755.8	40	155 752.2	1 233.8
	29	8	9	893.44	.50	9	53 604.3	45	163 539.1	1 360.3
33	30	30.808	30	924.25	1848.50	30	55 452.8	1 50	171 326.0	1 492.9
	31	8	1	955.06	.51	1	57 301.3	55	179 112.7	1 631.7
	32	9	2	985.87	.51	2	59 149.8	2 00	186 899	1 777
	33	9	3	1 016.68	.52	3	60 998.3	3 00	280 328	3 997
	34	9	4	1 047.48	.52	4	62 846.8	4 00	373 731	7 106
33	35	30.809	35	1 078.29	1848.53	35	64 695.3	5 00	467 100	11 102
	36	9	6	1 109.10	.53	6	66 543.9	6 00	560 428	15 986
	37	9	7	1 139.91	.54	7	68 392.4	7 00	653 704	21 757
	38	9	8	1 170.72	.54	8	70 241.0	8 00	746 922	28 414
	39	9	9	1 201.53	.55	9	72 089.5	9 00	840 072	35 957
33	40	30.809	40	1 232.33	1848.55	40	73 938.0	10 00	933 146	44 385
	41	9	1	1 263.14	.56	1	75 786.6	11 00	1 026 136	53 697
	42	9	2	1 293.95	.56	2	77 635.2	12 00	1 119 033	63 893
	43	09	3	1 324.76	.57	3	79 483.7	13 00	1 211 829	74 971
	44	10	4	1 355.57	.57	4	81 332.3	14 00	1 304 515	86 931
33	45	30.810	45	1 386.38	1848.58	45	83 180.9	15 00	1 397 083	99 771
	46	0	6	1 417.18	.58	6	85 029.4	16 00	1 489 526	113 491
	47	0	7	1 447.99	.59	7	86 878.0	17 00	1 581 834	128 089
	48	0	8	1 478.80	.59	8	88 726.6	18 00	1 673 998	143 564
	49	0	9	1 509.61	.60	9	90 575.2	19 00	1 766 011	159 914
33	50	30.810	50	1 540.42	1848.60	50	92 423.8	20 00	1 857 866	177 138
	51	0	1	1 571.23	.61	1	94 272.4	21 00	1 949 553	195 234
	52	0	2	1 602.03	.61	2	96 121.0	22 00	2 041 062	214 201
	53	0	3	1 632.84	.62	3	97 969.6	23 00	2 132 387	234 037
	54	0	4	1 663.65	.62	4	99 818.2	24 00	2 223 521	254 740
33	55	30.810	55	1 694.46	1848.63	55	101 666.9	25 00	2 314 453	276 309
	56	1	6	1 725.27	.63	6	103 515.5	26 00	2 405 175	298 741
	57	1	7	1 756.08	.64	7	105 364.1	27 00	2 495 680	322 034
	58	1	8	1 786.88	.64	8	107 212.8	28 00	2 585 961	346 187
	59	1	9	1 817.69	.65	9	109 061.4	29 00	2 676 007	371 197
33	60	30.811	60	1 848.50	1848.65	60	110 910.1	30 00	2 765 812	397 061

Latitude 34° to 35°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
34 00	25.663	51.33	76.99	102.65	128.32	153.98	179.64	205.30	230.97	1539.8	3079.6	4619.3	6159.1	7698.9
1	.658	.32	.97	.63	.29	.95	.61	.26	.92	9.5	9.0	8.4	7.9	7.4
2	.653	.31	.96	.61	.27	.92	.57	.22	.88	9.2	8.4	7.5	6.7	5.9
3	.648	.30	.94	.59	.24	.89	.54	.18	.83	8.9	7.7	6.6	5.5	4.4
4	.643	.29	.93	.57	.22	.86	.50	.14	.79	8.6	7.1	5.7	4.3	2.9
34 05	25.638	51.28	76.91	102.55	128.19	153.83	179.47	205.10	230.74	1538.3	3076.5	4614.8	6153.1	7691.4
6	.633	.27	.90	.53	.16	.80	.43	.06	.70	8.0	5.9	3.9	1.9	89.9
7	.628	.26	.88	.51	.14	.77	.40	5.02	.65	7.7	5.3	3.0	50.7	8.4
8	.623	.25	.87	.49	.11	.74	.36	4.98	.60	7.4	4.7	2.1	49.5	6.8
9	.618	.24	.85	.47	.09	.71	.33	.94	.56	7.1	4.1	1.2	8.3	5.3
34 10	25.613	51.23	76.84	102.45	128.06	153.68	179.29	204.90	230.51	1536.8	3073.5	4610.3	6147.1	7683.8
11	.608	.22	.82	.43	.04	.65	.26	.86	.47	6.5	2.9	09.4	5.9	2.3
12	.603	.21	.81	.41	8.01	.62	.22	.82	.42	6.2	2.3	8.5	4.6	80.8
13	.598	.20	.79	.39	7.99	.59	.19	.78	.38	5.9	1.7	7.6	3.4	79.3
14	.593	.19	.78	.37	.96	.56	.15	.74	.33	5.6	1.1	6.7	2.2	7.8
34 15	25.588	51.18	76.76	102.35	127.94	153.53	179.12	204.70	230.29	1535.3	3070.5	4605.8	6141.0	7676.3
16	.583	.16	.75	.33	.91	.50	.08	.66	.24	5.0	69.9	4.9	39.8	4.8
17	.577	.15	.73	.31	.89	.46	.04	.62	.20	4.6	9.3	3.9	8.6	3.2
18	.572	.14	.72	.29	.86	.43	9.01	.58	.15	4.3	8.7	3.0	7.4	1.7
19	.567	.13	.70	.27	.84	.40	8.97	.54	.11	4.0	8.1	2.1	6.2	70.2
34 20	25.562	51.12	76.69	102.25	127.81	153.37	178.94	204.50	230.06	1533.7	3067.5	4601.2	6135.0	7668.7
21	.557	.11	.67	.23	.79	.34	.90	.46	30.02	3.4	6.9	600.3	3.7	7.2
22	.552	.10	.66	.21	.76	.31	.87	.42	29.97	3.1	6.3	599.4	2.5	5.7
23	.547	.09	.64	.19	.74	.28	.83	.38	.92	2.8	5.6	8.5	1.3	4.1
24	.542	.08	.63	.17	.71	.25	.80	.34	.88	2.5	5.0	7.6	30.1	2.6
34 25	25.537	51.07	76.61	102.15	127.69	153.22	178.76	204.30	229.83	1532.2	3064.4	4596.7	6128.9	7661.1
26	.532	.06	.60	.13	.66	.19	.72	.26	.79	1.9	3.8	5.8	7.7	59.6
27	.527	.05	.58	.11	.64	.16	.69	.21	.74	1.6	3.2	4.9	6.4	8.1
28	.522	.04	.57	.09	.61	.13	.65	.17	.70	1.3	2.6	3.9	5.2	6.5
29	.517	.03	.55	.07	.59	.10	.62	.13	.65	1.0	2.0	3.0	4.0	5.0
34 30	25.512	51.02	76.54	102.05	127.56	153.07	178.58	204.09	229.61	1530.7	3061.4	4592.1	6122.8	7653.5
31	.507	.01	.52	.03	.53	.04	.55	.05	.56	0.4	0.8	1.2	1.6	2.0
32	.501	1.00	.50	2.01	.51	3.01	.51	4.01	.51	30.1	60.2	90.3	20.4	50.4
33	.496	0.99	.49	1.99	.48	2.98	.48	3.97	.47	29.8	59.6	89.3	19.1	48.9
34	.491	.98	.47	.97	.46	.95	.44	.93	.42	9.5	9.0	8.4	7.9	7.4
34 35	25.486	50.97	76.46	101.94	127.43	152.92	178.41	203.89	229.38	1529.2	3058.3	4587.5	6116.7	7645.9
36	.481	.96	.44	.92	.40	.89	.37	.85	.33	8.9	7.7	6.6	5.5	4.3
37	.476	.95	.43	.90	.38	.86	.34	.81	.28	8.6	7.1	5.7	4.2	2.8
38	.471	.94	.41	.88	.35	.83	.30	.77	.24	8.3	6.5	4.8	3.0	41.3
39	.466	.93	.40	.86	.33	.80	.27	.73	.19	8.0	5.9	3.9	1.8	39.8
34 40	25.461	50.92	76.38	101.84	127.30	152.76	178.23	203.69	229.15	1527.6	3055.3	4582.9	6110.6	7638.2
41	.456	.91	.37	.82	.28	.73	.19	.65	.10	7.3	4.7	2.0	09.4	6.7
42	.451	.90	.35	.80	.25	.70	.16	.61	.06	7.0	4.1	1.1	8.2	5.2
43	.445	.89	.34	.78	.23	.67	.12	.56	9.01	6.7	3.4	80.1	6.9	3.6
44	.440	.88	.32	.76	.20	.64	.08	.52	8.96	6.4	2.8	79.2	5.7	2.1
34 45	25.435	50.87	76.31	101.74	127.17	152.61	178.05	203.48	228.92	1526.1	3052.2	4578.3	6104.5	7630.6
46	.430	.86	.29	.72	.15	.58	8.01	.44	.87	5.8	1.6	7.4	3.2	29.0
47	.425	.85	.28	.70	.12	.55	7.98	.40	.83	5.5	1.0	6.5	2.0	7.5
48	.420	.84	.26	.68	.10	.52	.94	.36	.78	5.2	50.4	5.5	100.8	6.0
49	.415	.83	.24	.66	.07	.49	.91	.32	.73	4.9	49.8	4.6	099.6	4.4
34 50	25.410	50.82	76.23	101.64	127.05	152.46	177.87	203.28	228.69	1524.6	3049.2	4573.7	6098.3	7622.9
51	.405	.81	.21	.62	.02	.43	.83	.24	.64	4.3	8.6	2.8	7.1	21.4
52	.399	.80	.20	.60	7.00	.40	.80	.20	.59	4.0	8.0	1.9	5.9	19.8
53	.394	.79	.18	.58	6.97	.37	.76	.15	.55	3.7	7.3	1.0	4.6	8.3
54	.389	.78	.17	.56	.95	.34	.73	.11	.50	3.4	6.7	70.1	3.4	6.8
34 55	25.384	50.77	76.15	101.54	126.92	152.30	177.69	203.07	228.46	1523.0	3046.1	4569.1	6092.2	7615.2
56	.379	.76	.14	.52	.89	.27	.65	3.03	.41	2.7	5.5	8.2	90.9	3.7
57	.374	.75	.12	.49	.87	.24	.62	2.99	.36	2.4	4.8	7.3	89.7	2.1
58	.369	.74	.11	.47	.84	.21	.58	.95	.32	2.1	4.2	6.3	8.5	10.6
59	.364	.73	.09	.45	.82	.18	.55	.91	.27	1.8	3.6	5.4	7.2	09.1
34 60	25.358	50.72	76.08	101.43	126.79	152.15	177.51	202.87	228.23	1521.5	3043.0	4564.5	6086.0	7607.5

Lat.		Latitude 34° to 35°—Meridional arcs.						Latitude 34°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 34° 30′		Value of 1′	Continuous sums of minutes from latitude 34° 00′		Longitude.	X	Y
°	′	Meters.	″	Meters.	Meters.	′	Meters.	° ′	Meters.	Meters.
34	00	30.811			1848.65					
	1	1	1	30.81	.66	1	1 848.7	0 1	1 539.8	0.1
	2	1	2	61.63	.66	2	3 697.3	2	3 079.6	0.5
	3	1	3	92.44	.67	3	5 546.0	3	4 619.3	1.1
	4	1	4	123.25	.67	4	7 394.6	4	6 159.1	2.0
34	05	30.811	5	154.07	1848.68	5	9 243.3	0 5	7 698.9	3.1
	6	1	6	184.88	.68	6	11 092.0	6	9 238.7	4.5
	7	1	7	215.69	.69	7	12 940.7	7	10 778.5	6.1
	8	2	8	246.51	.69	8	14 789.4	8	12 318.3	8.0
	9	2	9	277.32	.70	9	16 638.1	9	13 858.0	10.1
34	10	30.812	10	308.13	1848.70	10	18 486.8	0 10	15 397.9	12.5
	11	2	1	338.95	.71	1	20 335.5	15	23 096.7	28.2
	12	2	2	369.76	.71	2	22 184.2	20	30 795.6	50.1
	13	2	3	400.57	.72	3	24 032.9	25	38 494.4	78.3
	14	2	4	431.39	.72	4	25 881.6	30	46 193.2	112.7
34	15	30.812	15	462.20	1848.73	15	27 730.4	0 35	53 892.0	153.4
	16	2	6	493.01	.73	6	29 579.1	40	61 590.8	200.4
	17	2	7	523.83	.74	7	31 427.8	45	69 289.5	253.6
	18	2	8	554.64	.74	8	33 276.6	50	76 988.2	313.1
	19	2	9	585.46	.75	9	35 125.3	55	84 686.8	378.8
34	20	30.813	20	616.27	1848.75	20	36 974.1	1 00	92 385.4	456.8
	21	3	1	647.08	.76	1	38 822.8	05	100 083.9	529.1
	22	3	2	677.90	.76	2	40 671.6	10	107 782.3	613.6
	23	3	3	708.71	.77	3	42 520.3	15	115 480.7	704.4
	24	3	4	739.52	.78	4	44 369.1	20	123 179.0	801.5
34	25	30.813	25	770.34	1848.78	25	46 217.9	1 25	130 877.2	904.8
	26	3	6	801.15	.79	6	48 066.7	30	138 575.3	1 014.4
	27	3	7	831.96	.79	7	49 915.5	35	146 273.4	1 130.2
	28	3	8	862.78	.80	8	51 764.3	40	153 971.3	1 252.3
	29	3	9	893.59	.80	9	53 613.1	45	161 669.2	1 380.7
34	30	30.813	30	924.40	1848.81	30	55 461.9	1 50	169 366.9	1 515.3
	31	4	1	955.22	.81	1	57 310.7	55	177 064.5	1 656.1
	32	4	2	986.03	.82	2	59 159.5	2 00	184 762	1 803
	33	4	3	1 016.84	.82	3	61 008.3	3 00	277 121	4 057
	34	4	4	1 047.66	.83	4	62 857.1	4 00	369 454	7 212
34	35	30.814	35	1 078.47	1848.83	35	64 705.9	5 00	461 751	11 268
	36	4	6	1 109.28	.84	6	66 554.8	6 00	554 004	16 225
	37	4	7	1 140.10	.84	7	68 403.6	7 00	646 205	22 082
	38	4	8	1 170.91	.85	8	70 252.5	8 00	738 344	28 839
	39	4	9	1 201.72	.85	9	72 101.3	9 00	830 413	36 494
34	40	30.814	40	1 232.54	1848.86	40	73 950.2	10 00	922 403	45 048
	41	4	1	1 263.35	.86	1	75 799.0	11 00	1 014 305	54 499
	42	4	2	1 294.16	.87	2	77 647.9	12 00	1 106 110	64 846
	43	5	3	1 324.98	.87	3	79 496.8	13 00	1 197 809	76 089
	44	5	4	1 355.79	.88	4	81 345.6	14 00	1 289 395	88 227
34	45	30.815	45	1 386.60	1848.88	45	83 194.5	15 00	1 380 858	101 258
	46	5	6	1 417.42	.89	6	85 043.4	16 00	1 472 190	115 180
	47	5	7	1 448.23	.89	7	86 892.3	17 00	1 563 381	129 993
	48	5	8	1 479.04	.90	8	88 741.2	18 00	1 654 423	145 696
	49	5	9	1 509.86	.90	9	90 590.1	19 00	1 745 308	162 287
34	50	30.815	50	1 540.67	1848.91	50	92 439.0	20 00	1 836 026	179 763
	51	5	1	1 571.48	.91	1	94 287.9	21 00	1 926 569	198 124
	52	5	2	1 602.30	.92	2	96 136.8	22 00	2 016 929	217 368
	53	5	3	1 633.11	.92	3	97 985.7	23 00	2 107 097	237 493
	54	5	4	1 663.93	.93	4	99 834.7	24 00	2 197 065	258 497
34	55	30.816	55	1 694.74	1848.93	55	101 683.6	25 00	2 286 823	280 378
	56	6	6	1 725.55	.94	6	103 532.5	26 00	2 376 363	303 134
	57	6	7	1 756.37	.94	7	105 381.5	27 00	2 465 677	326 763
	58	6	8	1 787.18	.95	8	107 230.4	28 00	2 554 756	351 262
	59	6	9	1 817.99	.95	9	109 079.4	29 00	2 643 591	376 629
34	60	30.816	60	1 848.81	1848.96	60	110 928.3	30 00	2 732 175	402 863

Latitude 35° to 36°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
35 00	25.358	50.72	76.08	101.43	126.79	152.15	177.51	202.87	228.23	1521.5	3043.0	4564.5	6086.0	7607.5
1	.353	.71	.06	.41	.76	.12	.47	.83	.18	1.2	2.4	3.6	4.8	6.0
2	.348	.70	.04	.39	.74	.09	.44	.78	.14	0.9	1.8	2.7	3.5	4.4
3	.343	.69	.03	.37	.71	.06	.40	.74	.09	0.6	1.2	1.7	2.3	2.9
4	.338	.68	.01	.35	.69	.03	.37	.70	.04	0.3	40.5	60.8	81.1	601.3
35 05	25.333	50.67	76.00	101.33	126.66	152.00	177.33	202.66	228.00	1520.0	3039.9	4559.9	6079.8	7599.8
6	.327	.65	5.98	.31	.63	1.96	.29	.62	7.95	19.6	9.3	9.0	8.6	8.2
7	.322	.64	.97	.29	.61	.93	.26	.58	.91	9.3	8.7	8.0	7.4	6.7
8	.317	.63	.95	.27	.58	.90	.22	.54	.86	9.0	8.0	7.1	6.1	5.1
9	.312	.62	.94	.25	.56	.87	.19	.50	.81	8.7	7.4	6.1	4.9	3.6
35 10	25.307	50.61	75.92	101.23	126.53	151.84	177.15	202.46	227.76	1518.4	3036.8	4555.2	6073.7	7592.1
11	.302	.60	.91	.21	.51	.81	.11	.41	.72	8.1	6.2	4.3	2.4	90.5
12	.296	.59	.89	.19	.48	.78	.08	.37	.67	7.8	5.6	3.4	71.1	88.9
13	.291	.58	.87	.17	.46	.75	.04	.33	.62	7.5	5.0	2.4	69.9	7.4
14	.286	.57	.86	.14	.43	.72	7.01	.29	.58	7.2	4.3	1.5	8.6	5.8
35 15	25.281	50.56	75.84	101.12	126.41	151.69	176.97	202.25	227.53	1516.9	3033.7	4550.6	6067.4	7584.3
16	.276	.55	.83	.10	.38	.65	.93	.21	.49	6.5	3.1	49.7	6.2	2.7
17	.271	.54	.81	.08	.35	.62	.90	.17	.44	6.2	2.5	8.7	5.0	81.2
18	.265	.53	.80	.06	.33	.59	.86	.12	.39	5.9	1.8	7.8	3.7	79.6
19	.260	.52	.78	.04	.30	.56	.82	.08	.34	5.6	1.2	6.8	2.5	8.1
35 20	25.255	50 51	75.77	101.02	126.28	151.53	176.79	202.04	227.30	1515.3	3030.6	4545.9	6061.2	7576.5
21	.250	.50	.75	1.00	.25	.50	.75	2.00	.25	5.0	30.0	5.0	60.0	5.0
22	.245	.49	.73	0.98	.23	.47	.72	1.96	.20	4.7	29.4	4.0	58.7	3.4
23	.240	.48	.72	.96	.20	.44	.68	.92	.16	4.4	8.8	3.1	7.5	1.9
24	.234	.47	.70	.94	.18	.41	.64	.87	.11	4.1	8.1	2.1	6.2	70.3
35 25	25.229	50.46	75.69	100.92	126.15	151.37	176.60	201.83	227.06	1513.7	3027.5	4541.2	6055.0	7568.7
26	.224	.45	.67	.90	.12	.34	.57	.79	7.02	3.4	6.9	40.3	3.8	7.2
27	.219	.44	.66	.87	.09	.31	.53	.75	6.97	3.1	6.2	39.4	2.5	5.6
28	.214	.43	.64	.85	.07	.28	.49	.71	.92	2.8	5.6	8.4	1.3	4.1
29	.208	.42	.63	.83	.04	.25	.46	.67	.88	2.5	5.0	7.5	50.0	2.5
35 30	25.203	50.41	75.61	100.81	126.02	151.22	176.42	201.63	226.83	1512.2	3024.4	4536.6	6048.8	7561.0
31	.198	.40	.59	.79	5.99	.19	.38	.58	.78	1.9	3.8	5.7	7.5	59.4
32	.193	.39	.58	.77	.97	.16	.35	.54	.74	1.6	3.1	4.7	6.2	7.8
33	.188	.38	.56	.75	.94	.13	.31	.50	.69	1.3	2.5	3.8	5.0	6.3
34	.182	.36	.55	.73	.91	.09	.28	.46	.64	0.9	1.9	2.8	3.8	4.7
35 35	25.177	50.35	75.53	100.71	125.88	151.06	176.24	201.42	226.60	1510.6	3021.2	4531.9	6042.5	7553.1
36	.172	.34	.52	.69	.86	.03	.20	.38	.55	0.3	0.6	1.0	1.3	1.6
37	.167	.33	.50	.67	.84	1.00	.17	.33	.50	10.0	20.0	30.0	40.0	50.0
38	.161	.32	.48	.65	.81	0.97	.13	.29	.45	09.7	19.4	29.1	38.7	48.4
39	.156	.31	.47	.63	.79	.94	.10	.25	.41	9.4	8.8	8.1	7.5	6.9
35 40	25.151	50.30	75.45	100.60	125.76	150.91	176.06	201.21	226.36	1509.1	3018.1	4527.2	6036.2	7545.3
41	.146	.29	.44	.58	.73	.87	6.02	.17	.31	8.7	7.5	6.3	5.0	3.7
42	.141	.28	.42	.56	.70	.84	5.99	.13	.27	8.4	6.9	5.3	3.8	2.2
43	.135	.27	.41	.54	.68	.81	.95	.08	.22	8.1	6.2	4.4	2.5	40.6
44	.130	.26	.39	.52	.65	.78	.91	.04	.17	7.8	5.6	3.4	31.2	39.0
35 45	25.125	50.25	75.37	100.50	125.62	150.75	175.87	201.00	226.12	1507.5	3015.0	4522.5	6029.9	7537.4
46	.120	.24	.36	.48	.60	.72	.84	0.96	.08	7.2	4.4	1.6	8.7	5.9
47	.114	.23	.34	.46	.57	.69	.80	.91	6.03	6.9	3.7	20.6	7.4	4.3
48	.109	.22	.33	.44	.54	.65	.76	.87	5.98	6.5	3.1	19.7	6.2	2.7
49	.104	.21	.31	.42	.52	.62	.72	.83	.94	6.2	2.5	8.7	5.0	31.2
35 50	25.099	50.20	75.30	100.39	125.49	150.59	175.69	200.79	225.89	1505.9	3011.8	4517.8	6023.7	7529.6
51	.093	.19	.28	.37	.46	.56	.65	.75	.84	5.6	1.2	6.8	2.4	8.0
52	.088	.18	.26	.35	.44	.53	.62	.70	.79	5.3	0.6	5.9	21.1	6.4
53	.083	.17	.25	.33	.41	.50	.58	.66	.75	5.0	10.0	4.9	19.9	4.9
54	.078	.16	.23	.31	.39	.47	.54	.62	.70	4.7	09.3	4.0	8.6	3.3
35 55	25.072	50.14	75.22	100.29	125.36	150.43	175.50	200.58	225.65	1504.3	3008.7	4513.0	6017.4	7521.7
56	.067	.13	.20	.27	.33	.40	.47	.54	.60	4.0	8.0	2.1	6.1	20.1
57	.062	.12	.19	.25	.31	.37	.43	.49	.55	3.7	7.4	1.1	4.8	18.5
58	.057	.11	.17	.23	.28	.34	.39	.45	.51	3.4	6.8	10.2	3.6	7.0
59	.051	.10	.15	.21	.26	.31	.36	.41	.46	3.1	6.2	09.2	2.3	5.4
35 60	25.046	50.09	75.14	100.18	125.23	150.28	175.32	200.37	225.41	1502.8	3005.5	4508.3	6011.0	7513.8

Lat.		Latitude 35° to 36°—Meridional arcs.						Latitude 35°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 35° 30′		Value of 1′	Continuous sums of minutes from latitude 35° 00′		Longitude.	X	Y
°	′	Meters.	″	Meters.	Meters.	′	Meters.	° ′	Meters.	Meters.
35	00	30.816			1848.96					
	1	6	1	30.82	.96	1	1 849.0	0 1	1 521.5	0.1
	2	6	2	61.64	.97	2	3 697.9	2	3 043.0	0.5
	3	6	3	92.46	.97	3	5 546.9	3	4 564.5	1.1
	4	6	4	123.27	.98	4	7 395.9	4	6 086.0	2.0
35	05	30.816	5	154.09	1848.99	5	9 244.9	0 5	7 607.5	3.2
	6	7	6	184.91	8.99	6	11 093.9	6	9 129.0	4.6
	7	7	7	215.73	9.00	7	12 942.8	7	10 650.5	6.2
	8	7	8	246.55	.00	8	14 791.8	8	12 172.0	8.1
	9	7	9	277.37	.01	9	16 640.8	9	13 693.5	10.3
35	10	30.817	10	308.19	1849.01	10	18 489.9	0 10	15 215.0	12.7
	11	7	1	339.00	.02	11	20 338.9	15	22 822.5	28.6
	12	7	2	369.82	.02	12	22 187.9	20	30 430.0	50.8
	13	7	3	400.64	.03	13	24 036.9	25	38 037.5	79.3
	14	7	4	431.46	.03	14	25 885.9	30	45 645.0	114.2
35	15	30.817	15	462.28	1849.04	15	27 735.0	0 35	53 252.4	155.5
	16	7	6	493.10	.04	16	29 584.0	40	60 859.7	203.1
	17	7	7	523.92	.05	17	31 433.1	45	68 467.1	257.0
	18	8	8	554.73	.05	18	33 282.1	50	76 074.3	317.3
	19	8	9	585.55	.06	19	35 131.2	55	83 681.6	384.0
35	20	30.818	20	616.37	1849.06	20	36 980.2	1 00	91 288.8	456.9
	21	8	1	647.19	.07	21	38 829.3	05	98 895.9	536.3
	22	8	2	678.01	.07	22	40 678.4	10	106 502.9	622.0
	23	8	3	708.83	.08	23	42 527.4	15	114 109.9	714.0
	24	8	4	739.65	.08	24	44 376.5	20	121 716.8	812.4
35	25	30.818	25	770.46	1849.09	25	46 225.6	1 25	129 323.6	917.1
	26	8	6	801.28	.09	26	48 074.7	30	136 930.3	1 028.1
	27	8	7	832.10	.10	27	49 923.8	35	144 536.9	1 145.5
	28	8	8	862.92	.10	28	51 772.9	40	152 143.4	1 269.3
	29	8	9	893.74	.11	29	53 622.0	45	159 749.8	1 399.4
35	30	30.819	30	924.56	1849.11	30	55 471.1	1 50	167 356.1	1 535.8
	31	9	1	955.38	.12	31	57 320.2	55	174 962.3	1 678.6
	32	9	2	986.19	.12	32	59 169.4	2 00	182 568	1 828
	33	9	3	1 017.01	.13	33	61 018.5	3 00	273 830	4 112
	34	9	4	1 047.83	.13	34	62 867.6	4 00	365 064	7 310
35	35	30.819	35	1 078.65	1849.14	35	64 716.7	5 00	456 261	11 421
	36	9	6	1 109.47	.15	36	66 565.9	6 00	547 412	16 445
	37	9	7	1 140.29	.15	37	68 415.0	7 00	638 509	22 381
	38	9	8	1 171.11	.16	38	70 264.2	8 00	729 542	29 229
	39	9	9	1 201.92	.16	39	72 113.3	9 00	820 501	36 987
35	40	30.819	40	1 232.74	1849.17	40	73 962.5	10 00	911 379	45 656
	41	20	1	1 263.56	.17	41	75 811.7	11 00	1 002 165	55 234
	42	0	2	1 294.38	.18	42	77 660.8	12 00	1 092 850	65 721
	43	0	3	1 325.20	.18	43	79 510.0	13 00	1 183 426	77 115
	44	0	4	1 356.02	.19	44	81 359.2	14 00	1 273 884	89 415
35	45	30.820	45	1 386.84	1849.19	45	83 208.4	15 00	1 364 214	102 619
	46	0	6	1 417.65	.20	46	85 057.6	16 00	1 454 407	116 728
	47	0	7	1 448.47	.20	47	86 906.8	17 00	1 544 454	131 738
	48	0	8	1 479.29	.21	48	88 756.0	18 00	1 634 347	147 650
	49	0	9	1 510.11	.21	49	90 605.2	19 00	1 724 076	164 460
35	50	30.820	50	1 540.93	1849.22	50	92 454.4	20 00	1 813 632	182 168
	51	0	1	1 571.75	.22	51	94 303.6	21 00	1 903 006	200 772
	52	0	2	1 602.57	.23	52	96 152.9	22 00	1 992 190	220 268
	53	1	3	1 633.38	.23	53	98 002.1	23 00	2 081 174	240 657
	54	1	4	1 664.20	1849.24	54	99 851.3	24 00	2 169 949	261 936
35	55	30.821	55	1 695.02	.24	55	101 700.6	25 00	2 258 507	284 102
	56	1	6	1 725.84	.25	56	103 549.8	26 00	2 346 838	307 154
	57	1	7	1 756.66	.25	57	105 399.1	27 00	2 434 934	331 089
	58	1	8	1 787.48	.26	58	107 248.3	28 00	2 522 787	355 905
	59	1	9	1 818.30	.26	59	109 097.6	29 00	2 610 386	381 598
35	60	30.821	60	1 849.11	1849.27	60	110 946.9	30 00	2 697 724	408 168

Latitude 36° to 37°—Arcs of the Parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
36 00	25.046	50.09	75.14	100.18	125.23	150.28	175.32	200.37	225.41	1502.8	3005.5	4508.3	6011.0	7513.8
1	.041	.08	.12	.16	.20	.25	.29	.33	.36	2.5	4.9	7.3	09.8	2.2
2	.035	.07	.11	.14	.18	.22	.25	.28	.32	2.2	4.3	6.4	8.5	10.6
3	.030	.06	.09	.12	.15	.18	.21	.24	.27	1.8	3.6	5.4	7.2	09.1
4	.025	.05	.08	.10	.13	.15	.17	.20	.22	1.5	3.0	4.5	6.0	7.5
36 05	25.020	50.04	75.06	100.08	125.10	150.12	175.14	200.16	225.17	1501.2	3002.4	4503.5	6004.7	7505.9
6	.014	.03	.04	.06	.07	.09	.10	.11	.13	0.9	1.7	2.6	3.4	4.3
7	.009	.02	.03	.04	.05	.06	.06	.07	.08	0.6	1.1	1.6	2.2	2.7
8	.004	.01	.01	100.02	5.02	50.02	5.02	200.03	5.03	500.2	3000.5	500.7	6000.9	501.1
9	4.999	50.00	5.00	99.99	4.99	49.99	4.99	199.99	4.99	499.9	2999.8	499.7	5999.6	499.6
36 10	24.993	49.99	74.98	99.97	124.97	149.96	174.95	199.95	224.94	1499.6	2999.2	4498.8	5998.4	7498.0
11	.988	.98	.96	.95	.94	.93	.91	.90	.89	9.3	8.6	7.8	7.1	6.4
12	.983	.97	.95	.93	.92	.90	.88	.86	.84	9.0	7.9	6.9	5.8	4.8
13	.977	.95	.93	.91	.89	.86	.84	.82	.80	8.6	7.3	5.9	4.6	3.2
14	.972	.94	.92	.89	.86	.83	.80	.78	.75	8.3	6.6	5.0	3.3	1.6
36 15	24.967	49.93	74.90	99.87	124.84	149.80	174.77	199.73	224.70	1498.0	2996.0	4494.0	5992.0	7490.0
16	.961	.92	.88	.85	.81	.77	.73	.69	.65	7.7	5.4	3.0	90.7	88.4
17	.956	.91	.87	.82	.78	.74	.69	.65	.60	7.4	4.7	2.1	89.5	6.8
18	.951	.90	.85	.80	.75	.70	.65	.61	.56	7.0	4.1	1.1	8.2	5.2
19	.946	.89	.84	.78	.73	.67	.62	.56	.51	6.7	3.4	90.2	6.9	3.7
36 20	24.940	49.88	74.82	99.76	124.70	149.64	174.58	199.52	224.46	1496.4	2992.8	4489.2	5985.7	7482.1
21	.935	.87	.80	.74	.67	.61	.54	.48	.41	6.1	2.2	8.3	4.4	80.5
22	.930	.86	.79	.72	65	.58	.51	.44	.36	5.8	1.5	7.3	3.1	78.9
23	.924	.85	.77	.70	.62	.54	.47	.39	.32	5.4	0.9	6.4	1.8	7.3
24	.919	.84	.76	.67	.59	.51	.43	.35	.27	5.1	90.2	5.4	80.5	5.7
36 25	24.914	49.83	74.74	99.65	124.57	149.48	174.39	199.31	224.22	1494.8	2989.6	4484.5	5979.3	7474.1
26	.908	.82	.72	.63	.54	.45	.36	.27	.17	4.5	9.0	3.5	8.0	2.5
27	.903	.81	.71	.61	.52	.42	.32	.22	.13	4.2	8.3	2.6	6.7	70.9
28	.898	.79	.69	.59	.49	.38	.28	.18	.08	3.8	7.7	1.6	5.4	69.3
29	.892	.78	.68	.57	.46	.35	.25	.14	4.03	3.5	7.0	80.7	4.2	7.7
36 30	24.887	49.77	74.66	99.55	124.44	149.32	174.21	199.10	223.98	1493.2	2986.4	4479.7	5972.9	7466.1
31	.882	.76	.64	.53	.41	.29	.17	.05	.93	2.9	5.8	8.7	1.6	4.5
32	.876	.75	63	.50	.38	.26	.14	9.01	.88	2.6	5.1	7.7	70.3	2.9
33	.871	.74	.61	.48	.35	.22	.10	8.97	.84	2.2	4.5	6.8	69.0	61.3
34	.866	.73	.60	.46	.33	.19	.06	.92	.79	1.9	3.8	5.8	7.7	59.7
36 35	24.860	49.72	74.58	99.44	124.30	149.16	174.02	198.88	223.74	1491.6	2983.2	4474.8	5966.5	7458.1
36	.855	.71	.56	.42	.28	.13	3.99	.84	.69	1.3	2.6	3.8	5.2	6.5
37	.850	.70	.55	.40	.25	.10	.95	.80	.64	1.0	1.9	2.9	3.9	4.9
38	.844	.69	.53	.38	.22	.06	.91	.75	.60	0.6	1.3	1.9	2.6	3.3
39	.839	.68	.52	.35	.19	.03	.87	.71	.55	0.3	0.6	1.0	1.3	1.7
36 40	24.834	49.67	74.50	99.33	124.17	149.00	173.84	198.67	223.50	1490.0	2980.0	4470.0	5960.1	7450.1
41	.828	.66	.48	.31	.14	8.97	.80	.63	.45	89.7	79.4	69.0	58.8	48.5
42	.823	.65	.47	.29	.12	.94	.76	.58	.40	9.4	8.7	8.1	7.5	6.8
43	.817	.63	.45	.27	.09	.90	.72	.54	.36	9.0	8.1	7.1	6.2	5.2
44	.812	.62	.44	.25	.06	.87	.69	.50	.31	8.7	7.4	6.2	4.9	3.6
36 45	24.807	49.61	74.42	99.23	124.03	148.84	173.65	198.45	223.26	1488.4	2976.8	4465.2	5953.6	7442.0
46	.801	.60	.40	.21	4.01	.81	.61	.41	.21	8.1	6.2	4.2	2.3	40.4
47	.796	.59	.39	.18	3.98	.78	.57	.37	.16	7.8	5.5	3.3	51.0	38.8
48	.791	.58	.37	.16	.95	.74	.54	.33	.12	7.4	4.9	2.3	49.8	7.2
49	.785	.57	.36	.14	.93	.71	.50	.28	.07	7.1	4.2	1.4	8.5	5.6
36 50	24.780	49.56	74.34	99.12	123.90	148.68	173.46	198.24	223.02	1486.8	2973.6	4460.4	5947.2	7434.0
51	.775	.55	.32	.10	.87	.65	.42	.20	2.97	6.5	3.0	59.4	5.9	2.4
52	.769	.54	.31	.08	.85	.62	.38	.15	.92	6.2	2.3	8.4	4.6	30.7
53	.764	.53	.29	.06	.82	.58	.35	.11	.87	5.8	1.7	7.5	3.3	29.1
54	.758	.52	.28	.03	.79	.55	.31	.07	.82	5.5	1.0	6.5	2.0	7.5
36 55	24.753	49.51	74.26	99.01	123.76	148.52	173.27	198.02	222.78	1485.2	2970.4	4455.5	5940.7	7425.9
56	.748	.50	.24	8.99	.74	.49	.23	7.98	.73	4.9	69.7	4.5	39.4	4.3
57	.742	.49	.23	.97	.71	.46	.20	.94	.68	4.6	9.1	3.6	8.1	2.7
58	.737	.47	.21	.95	.68	.42	.16	.89	.63	4.2	8.4	2.6	6.8	21.0
59	.731	.46	.19	.93	.66	.39	.12	.85	.58	3.9	7.8	1.7	5.5	19.4
36 60	24.726	49.45	74.18	98.90	123.63	148.36	173.08	197.81	222.53	1483.6	2967.1	4450.7	5934.3	7417.8

Lat.		Latitude 36° to 37°—Meridional arcs.						Latitude 36°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 36° 30′		Value of 1′	Continuous sums of minutes from latitude 36° 00′		Longitude.	X	Y
°	′	Meters.	″	Meters.	Meters.	′	Meters.	° ′	Meters.	Meters.
36	00	30.821			1849.27					
	1	1	1	30.82	.28	1	1 849.3	0 1	1 502.8	0.1
	2	1	2	61.65	.28	2	3 698.5	2	3 005.5	0.5
	3	1	3	92.47	.29	3	5 547.8	3	4 508.3	1.2
	4	2	4	123.29	.29	4	7 397.1	4	6 011.1	2.1
36	05	30.822	5	154.12	1849.30	5	9 246.4	0 5	7 513.8	3.2
	6	2	6	184.94	.30	6	11 095.7	6	9 016.6	4.6
	7	2	7	215.77	.31	7	12 945.0	7	10 519.3	6.3
	8	2	8	246.59	.31	8	14 794.3	8	12 022.1	8.2
	9	2	9	277.41	.32	9	16 643.6	9	13 524.8	10.4
36	10	30.822	10	308.24	1849.32	10	18 493.0	0 10	15 027.6	12.8
	11	2	1	339.06	.33	1	20 342.3	15	22 541.4	28.9
	12	2	2	369.89	.33	2	22 191.6	20	30 055.2	51.4
	13	2	3	400.71	.34	3	24 040.9	25	37 568.9	80.3
	14	2	4	431.53	.34	4	25 890.3	30	45 082.7	115.6
36	15	30.822	15	462.36	1849.35	15	27 739.6	0 35	52 596.4	157.4
	16	3	6	493.18	.35	6	29 589.0	40	60 110.0	205.6
	17	3	7	524.00	.36	7	31 438.3	45	67 623.6	260.2
	18	3	8	554.83	.36	8	33 287.7	50	75 137.3	321.2
	19	3	9	585.65	.37	9	35 137.1	55	82 650.8	388.7
36	20	30.823	20	616.48	1849.37	20	36 986.4	1 00	90 164.3	462.5
	21	3	1	647.30	.38	1	38 835.8	05	97 677.7	542.8
	22	3	2	678.12	.38	2	40 685.2	10	105 191.0	629.5
	23	3	3	708.95	.39	3	42 534.6	15	112 704.2	722.6
	24	3	4	739.77	.40	4	44 384.0	20	120 217.4	822.2
36	25	30.823	25	770.59	1849.40	25	46 233.4	1 25	127 730.4	928.2
	26	3	6	801.42	.41	6	48 082.8	20	135 243.4	1 040.6
	27	4	7	832.24	.41	7	49 932.2	35	142 756.3	1 159.4
	28	4	8	863.07	.42	8	51 781.6	40	150 269.1	1 284.7
	29	4	9	893.89	.42	9	53 631.0	45	157 781.7	1 416.4
36	30	30.824	30	924.71	1849.43	30	55 480.4	1 50	165 294.3	1 554.5
	31	4	1	955.54	.43	1	57 329.9	55	172 806.8	1 699.0
	32	4	2	986.36	.44	2	59 179.3	2 00	180 319	1 850
	33	4	3	1 017.18	.44	3	61 028.7	3 00	270 455	4 162
	34	4	4	1 048.01	.45	4	62 878.2	4 00	360 562	7 399
36	35	30.824	35	1 078.83	1849.45	35	64 727.6	5 00	450 631	11 560
	36	4	6	1 109.66	.46	6	66 577.1	6 00	540 653	16 645
	37	4	7	1 140.48	.46	7	68 426.6	7 00	630 618	22 652
	38	4	8	1 171.30	.47	8	70 276.0	8 00	720 517	29 583
	39	5	9	1 202.13	.47	9	72 125.5	9 00	810 340	37 435
36	40	30.825	40	1 232.95	1849.48	40	73 975.0	10 00	900 078	46 209
	41	5	1	1 263.77	.48	1	75 824.5	11 00	989 720	55 903
	42	5	2	1 294.60	.49	2	77 673.9	12 00	1 079 259	66 515
	43	5	3	1 325.42	.49	3	79 523.4	13 00	1 168 684	78 046
	44	5	4	1 356.25	.50	4	81 372.9	14 00	1 257 987	90 494
36	45	30.825	45	1 387.07	1849.51	45	83 222.4	15 00	1 347 156	103 856
	46	5	6	1 417.89	.51	6	85 071.9	16 00	1 436 184	118 133
	47	5	7	1 448.72	.52	7	86 922.5	17 00	1 525 061	133 323
	48	5	8	1 479.54	.52	8	88 772.0	18 00	1 613 777	149 423
	49	5	9	1 510.36	.53	9	90 620.5	19 00	1 702 324	166 433
36	50	30.826	50	1 541.19	1849.53	50	92 470.0	20 00	1 790 691	184 350
	51	6	1	1 572.01	.54	1	94 319.6	21 00	1 878 870	203 173
	52	6	2	1 602.84	.54	2	96 169.1	22 00	1 966 851	222 899
	53	6	3	1 633.66	.55	3	98 018.6	23 00	2 054 625	243 527
	54	6	4	1 664.48	.55	4	99 868.2	24 00	2 142 183	265 055
36	55	30.826	55	1 695.31	1849.56	55	101 717.8	25 00	2 229 516	287 479
	56	6	6	1 726.13	.56	6	103 567.3	26 00	2 316 613	310 798
	57	6	7	1 756.95	.57	7	105 416.9	27 00	2 403 467	335 009
	58	6	8	1 787.78	.57	8	107 266.5	28 00	2 490 068	360 111
	59	6	9	1 818.60	.58	9	109 116.0	29 00	2 576 407	386 099
36	60	30.826	60	1 849.43	1849.58	60	110 965.6	30 00	2 662 475	412 971

Latitude 37° to 38°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
37 00	24.726	49.45	74.18	98.90	123.63	148.36	173.08	197.81	222.53	1483.6	2967.1	4450.7	5934.3	7417.8
1	.721	.44	.16	.88	.60	.33	.05	.77	.48	3.3	6.5	49.7	3.0	6.3
2	.715	.43	.15	.86	.57	.29	3.00	.72	.43	2.9	5.8	8.7	1.7	4.6
3	.710	.42	.13	.84	.55	.26	2.97	.68	.39	2.6	5.2	7.8	30.4	2.9
4	.704	.41	.11	.82	.52	.23	.93	.64	.34	2.3	4.5	6.8	29.1	1.3
37 05	24.699	49.40	74.10	98.80	123.49	148.19	172.89	197.59	222.29	1481.9	2963.9	4445.8	5927.8	7409.7
6	.694	.39	.08	.77	.46	.16	.85	.55	.24	1.6	3.2	4.8	6.5	8.1
7	.688	.38	.07	.75	.43	.13	.82	.51	.19	1.3	2.6	3.9	5.2	6.5
8	.683	.36	.05	.73	.41	.10	.78	.46	.15	1.0	1.9	2.9	3.9	4.8
9	.677	.35	.03	.71	.38	.06	.74	.42	.10	0.6	1.3	2.0	2.6	3.2
37 10	24.672	49.34	74.02	98.69	123.36	148.03	172.70	197.38	222.05	1480.3	2960.6	4441.0	5921.3	7401.6
11	.667	.33	4.00	.67	.33	8.00	.66	.33	2.00	80.0	60.0	40.0	20.0	400.0
12	.661	.32	3.98	.64	.30	7.97	.63	.29	1.95	79.7	59.3	39.0	18.7	398.3
13	.656	.31	.97	.62	.27	.93	.59	.25	.90	9.3	8.7	8.1	7.4	6.7
14	.650	.30	.95	.60	.25	.90	.55	.20	.85	9.0	8.0	7.1	6.1	5.1
37 15	24.645	49.29	73.93	98.58	123.22	147.87	172.51	197.16	221.81	1478.7	2957.4	4436.1	5914.8	7393.4
16	.639	.28	.92	.56	.20	.84	.48	.12	.76	8.4	6.7	5.1	3.5	1.8
17	.634	.27	.90	.54	.17	.81	.44	.07	.71	8.1	6.1	4.1	2.2	90.2
18	.629	.26	.89	.51	.14	.77	.40	7.03	.66	7.7	5.4	3.2	10.8	88.6
19	.623	.25	.87	.49	.12	.74	.36	6.98	.61	7.4	4.8	2.2	09.5	6.9
37 20	24.618	49.24	73.85	98.47	123.09	147.71	172.32	196.94	221.56	1477.1	2954.1	4431.2	5908.2	7385.3
21	.612	.23	.84	.45	.06	.68	.29	.90	.51	6.8	3.5	30.2	6.9	3.7
22	.607	.21	.82	.43	.04	.64	.24	.85	.46	6.4	2.8	29.2	5.6	2.0
23	.601	.20	.80	.41	3.01	.61	.21	.81	.41	6.1	2.2	8.3	4.3	80.4
24	.596	.19	.79	.38	2.98	.58	.17	.77	.36	5.8	1.5	7.3	3.0	78.8
37 25	24.590	49.18	73.77	98.36	122.95	147.54	172.13	196.72	221.32	1475.4	2950.9	4426.3	5901.7	7377.1
26	.585	.17	.75	.34	.93	.51	.09	.68	.27	5.1	50.2	5.3	900.4	5.5
27	.580	.16	.74	.32	.90	.48	.06	.64	.22	4.8	49.6	4.3	899.1	3.9
28	.574	.15	.72	.30	.87	.44	2.02	.59	.17	4.4	8.9	3.4	7.8	2.2
29	.569	.14	.71	.28	.85	.41	1.98	.55	.12	4.1	8.3	2.4	6.5	70.6
37 30	24.563	49.13	73.69	98.25	122.82	147.38	171.94	196.51	221.07	1473.8	2947.6	4421.4	5895.2	7369.0
31	.558	.12	.67	.23	.79	.35	.91	.46	1.02	3.5	6.9	20.4	4.9	7.3
32	.552	.11	.66	.21	.76	.31	.86	.42	0.97	3.1	6.3	19.4	3.5	5.7
33	.547	.09	.64	.19	.74	.28	.83	.37	.92	2.8	5.6	8.4	2.2	4.0
34	.541	.08	.62	.17	.71	.25	.79	.33	.87	2.5	5.0	7.5	90.9	2.4
37 35	24.536	49.07	73.61	98.14	122.68	147.22	171.75	196.29	220.82	1472.2	2944.3	4416.5	5888.6	7360.8
36	.530	.06	.59	.12	.65	.18	.71	.24	.78	1.8	3.6	5.5	7.3	59.1
37	.525	.05	.58	.10	.62	.15	.67	.20	.73	1.5	3.0	4.5	6.0	7.5
38	.519	.04	.56	.08	.60	.12	.64	.16	.68	1.2	2.3	3.5	4.7	5.8
39	.514	.03	.54	.06	.57	.08	.60	.11	.63	0.8	1.7	2.5	3.4	4.2
37 40	24.509	49.02	73.53	98.03	122.54	147.05	171.56	196.07	220.58	1470.5	2941.0	4411.5	5882.0	7352.6
41	.503	.01	.51	8.01	.51	7.02	.52	6.02	.53	70.2	40.3	10.5	80.7	50.9
42	.498	9.00	.49	7.99	.49	6.99	.48	5.98	.48	69.9	39.7	09.5	79.4	49.3
43	.492	8.98	.48	.97	.46	.95	.45	.94	.43	9.5	9.0	8.6	8.1	7.6
44	.487	.97	.46	.95	.43	.92	.41	.89	.38	9.2	8.4	7.6	6.8	6.0
37 45	24.481	48.96	73.44	97.92	122.40	146.89	171.37	195.85	220.33	1468.9	2937.7	4406.6	5875.5	7344.3
46	.476	.95	.43	.90	.38	.85	.33	.80	.28	8.5	7.0	5.6	4.1	2.7
47	.470	.94	.41	.88	.35	.82	.29	.76	.23	8.2	6.4	4.6	2.8	41.0
48	.465	.93	.39	.86	.32	.79	.26	.72	.18	7.9	5.7	3.7	1.5	39.4
49	.459	.92	.38	.84	.30	.75	.21	.67	.13	7.5	5.1	2.7	70.2	7.7
37 50	24.454	48.91	73.36	97.81	122.27	146.72	171.17	195.63	220.08	1467.2	2934.4	4401.7	5868.9	7336.1
51	.448	.90	.34	.79	.24	.69	.14	.58	20.03	6.9	3.7	400.7	7.5	4.4
52	.443	.89	.33	.77	.21	.66	.10	.54	19.98	6.6	3.1	399.7	6.2	2.8
53	.437	.87	.31	.75	.19	.62	.06	.50	.93	6.2	2.4	8.7	4.9	31.1
54	.432	.86	.30	.73	.16	.59	1.02	.45	.88	5.9	1.8	7.7	3.6	29.5
37 55	24.426	48.85	73.28	97.70	122.13	146.56	170.98	195.41	219.83	1465.6	2931.1	4396.7	5862.3	7327.8
56	.421	.84	.26	.68	.10	.52	.94	.36	.79	5.2	30.5	5.7	60.9	6.2
57	.415	.83	.25	.66	.07	.49	.91	.32	.74	4.9	29.8	4.7	59.6	4.5
58	.410	.82	.23	.64	.05	.46	.87	.28	.69	4.6	9.1	3.7	8.3	2.9
59	.404	.81	.21	.62	2.02	.42	.83	.23	.64	4.2	8.5	2.7	7.0	21.2
37 60	24.399	48.80	73.20	97.59	121.99	146.39	170.79	195.19	219.59	1463.9	2927.8	4391.7	5855.6	7319.6

Lat.		Latitude 37° to 38°—Meridional arcs.						Latitude 37°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 37° 30′		Value of 1′	Continuous sums of minutes from latitude 37° 00′		Longitude.	X	Y
°	′	Meters.	″	Meters.	Meters.	′	Meters.	° ′	Meters.	Meters.
37	00	30.826			1849.58					
	1	6	1	30.83	.59	1	1 849.6	0 1	1 483.6	0.1
	2	7	2	61.66	.59	2	3 699.2	2	2 967.1	0.5
	3	7	3	92.49	.60	3	5 548.8	3	4 450.7	1.2
	4	7	4	123.32	.61	4	7 398.4	4	5 934.2	2.1
37	05	30.827	5	154.15	1849.61	5	9 248.0	0 5	7 417.8	3.3
	6	7	6	184.97	.62	6	11 097.6	6	8 901.4	4.7
	7	7	7	215.80	.62	7	12 947.2	7	10 384.9	6.4
	8	7	8	246.63	.63	8	14 796.8	8	11 868.5	8.3
	9	7	9	277.46	.63	9	16 646.5	9	13 352.1	10.5
37	10	30.827	10	308.29	1849.64	10	18 496.1	0 10	14 835.6	13.0
	11	7	1	339.12	.64	1	20 345.7	15	22 253.4	29.2
	12	7	2	369.95	.65	2	22 195.4	20	29 671.2	51.9
	13	8	3	400.78	.65	3	24 045.0	25	37 089.0	81.2
	14	8	4	431.61	.66	4	25 894.7	30	44 506.7	116.9
37	15	30.828	15	462.44	1849.66	15	27 744.4	0 35	51 924.4	159.1
	16	8	6	493.26	.67	6	29 594.0	40	59 342.1	207.8
	17	8	7	524.09	.67	7	31 443.7	45	66 759.7	263.0
	18	8	8	554.92	.68	8	33 293.4	50	74 177.2	324.6
	19	8	9	585.75	.68	9	35 143.1	55	81 594.7	392.8
37	20	30.828	20	616.58	1849.69	20	36 992.7	1 00	89 012.2	467.5
	21	8	1	647.41	.69	1	38 842.4	05	96 429.6	548.6
	22	8	2	678.24	.70	2	40 692.1	10	103 846.9	636.3
	23	8	3	709.07	.71	3	42 541.8	15	111 264.1	730.4
	24	9	4	739.90	.71	4	44 391.5	20	118 681.2	831.1
37	25	30.829	25	770.73	1849.72	25	46 241.3	1 25	126 098.3	938.2
	26	9	6	801.56	.72	6	48 091.0	30	133 515.2	1 051.8
	27	9	7	832.38	.73	7	49 940.7	35	140 932.1	1 171.9
	28	9	8	863.21	.73	8	51 790.4	40	148 348.8	1 298.5
	29	9	9	894.04	.74	9	53 640.2	45	155 765.4	1 431.6
37	30	30.829	30	924.87	1849.74	30	55 489.9	1 50	163 181.9	1 571.2
	31	9	1	955.70	.75	1	57 339.6	55	170 598.3	1 717.3
	32	9	2	986.53	.75	2	59 189.4	2 00	178 015	1 870
	33	9	3	1 017.36	.76	3	61 039.1	3 00	266 997	4 207
	34	9	4	1 048.19	.76	4	62 888.9	4 00	355 951	7 479
37	35	30.829	35	1 079.02	1849.77	35	64 738.7	5 00	444 865	11 685
	36	30	6	1 109.85	.77	6	66 588.4	6 00	533 730	16 824
	37	0	7	1 140.67	.78	7	68 438.2	7 00	622 536	22 896
	38	0	8	1 171.50	.78	8	70 288.0	8 00	711 273	29 901
	39	0	9	1 202.33	.79	9	72 137.8	9 00	799 932	37 838
37	40	30.830	40	1 233.16	1849.80	40	73 987.6	10 00	888 503	46 706
	41	0	1	1 263.99	.80	1	75 837.4	11 00	976 975	56 503
	42	0	2	1 294.82	.81	2	77 687.2	12 00	1 065 340	67 229
	43	0	3	1 325.65	.81	3	79 537.0	13 00	1 153 587	78 882
	44	0	4	1 356.48	.82	4	81 386.8	14 00	1 241 707	91 462
37	45	30.830	45	1 387.31	1849.82	45	83 236.6	15 00	1 329 690	104 967
	46	0	6	1 418.14	.83	6	85 086.5	16 00	1 417 526	119 395
	47	1	7	1 448.96	.83	7	86 936.3	17 00	1 505 206	134 745
	48	1	8	1 479.79	.84	8	88 786.1	18 00	1 592 721	151 015
	49	1	9	1 510.62	.84	9	90 636.0	19 00	1 680 059	168 203
37	50	30.831	50	1 541.45	1849.85	50	92 485.8	20 00	1 767 211	186 307
	51	1	1	1 572.28	.85	1	94 335.7	21 00	1 854 169	205 326
	52	1	2	1 603.11	.86	2	96 185.5	22 00	1 940 922	225 258
	53	1	3	1 633.94	.86	3	98 035.4	23 00	2 027 462	246 099
	54	1	4	1 664.77	.87	4	99 885.2	24 00	2 113 777	267 849
37	55	30.831	55	1 695.60	1849.88	55	101 735.1	25 00	2 199 860	290 503
	56	1	6	1 726.43	.88	6	103 585.0	26 00	2 285 699	314 061
	57	1	7	1 757.26	.89	7	105 434.9	27 00	2 371 287	338 519
	58	2	8	1 788.08	.89	8	107 284.8	28 00	2 456 612	363 874
	59	2	9	1 818.91	.90	9	109 134.7	29 00	2 541 667	390 125
37	60	30.832	60	1 849.74	1849.90	60	110 984.5	30 00	2 626 441	417 267

Latitude 38° to 39°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
38 00	24.399	48.80	73.20	97.59	121.99	146.39	170.79	195.19	219.59	1463.9	2927.8	4391.7	5855.6	7319.6
1	.393	.79	.18	.57	.96	.36	.75	.15	.54	3.6	7.1	90.7	4.3	7.9
2	.387	.78	.16	.55	.94	.32	.71	.10	.49	3.2	6.5	89.7	3.0	6.2
3	.382	.77	.15	.53	.91	.29	.67	.06	.44	2.9	5.8	8.7	1.7	4.6
4	.376	.76	.13	.51	.88	.26	.63	5.01	.39	2.6	5.2	7.7	50.3	2.9
38 05	24.371	48.74	73.11	97.48	121.86	146.22	170.60	194.97	219.34	1462.3	2924.5	4386.7	5849.0	7311.3
6	.365	.73	.10	.46	.83	.19	.56	.93	.29	1.9	3.8	5.7	7.7	09.6
7	.360	.72	.08	.44	.80	.16	.52	.88	.24	1.6	3.2	4.7	6.3	7.9
8	.354	.71	.06	.42	.77	.13	.48	.84	.19	1.3	2.5	3.8	5.0	6.3
9	.349	.70	.05	.39	.75	.09	.44	.79	.14	0.9	1.9	82.8	3.7	4.6
38 10	24.343	48.69	73.03	97.37	121.72	146.06	170.40	194.75	219.09	1460.6	2921.2	4381.8	5842.4	7303.0
11	.338	.68	.01	.35	.69	6.03	.36	.71	9.04	60.3	20.5	80.8	41.0	301.3
12	.332	.67	3.00	.33	.66	5.99	.32	.66	8.99	59.9	19.8	79.8	39.7	299.6
13	.327	.66	2.98	.31	.64	.96	.29	.62	.94	9.6	9.2	8.8	8.4	8.0
14	.321	.65	.96	.29	.61	.93	.25	.57	.89	9.3	8.5	7.8	7.0	6.3
38 15	24.315	48.63	72.95	97.26	121.58	145.89	170.21	194.53	218.84	1458.9	2917.8	4376.8	5835.7	7294.6
16	.310	.62	.93	.24	.55	.86	.17	.48	.79	8.6	7.2	5.8	4.4	3.0
17	.304	.61	.91	.22	.52	.83	.13	.44	.74	8.3	6.5	4.8	3.0	91.3
18	.299	60	.90	.19	.50	.79	.09	.39	.69	7.9	5.8	3.8	1.7	89.6
19	.293	.59	.88	.17	.47	.76	.05	.35	.64	7.6	5.2	2.8	30.4	8.0
38 20	24.288	48.58	72.86	97.15	121.44	145.73	170.01	194.30	218.59	1457.3	2914.5	4371.8	5829.0	7286.3
21	.282	.57	.85	.13	.41	.69	69.97	.26	.54	6.9	3.8	70.8	7.7	4.6
22	.276	.56	.83	.11	.38	.66	.93	.21	.49	6.6	3.2	69.8	6.4	2.9
23	.271	.54	.81	.08	.36	.63	.89	.17	.44	6.3	2.5	8.8	5.0	81.3
24	.265	.53	.80	.06	.33	.59	.85	.12	.39	5.9	1.9	7.8	3.7	79.6
38 25	24.260	48.52	72.78	97.04	121.30	145.56	169.82	194.08	218.34	1455.6	2911.2	4366.8	5822.3	7277.9
26	.254	.51	.76	.02	.27	.53	.78	4.04	.29	5.3	10.5	5.8	21.0	6.3
27	.249	.50	.75	7.00	.24	.49	.74	3.99	.24	4.9	09.8	4.8	19.7	4.6
28	.243	.48	.73	6.97	.22	.46	.70	.95	.19	4.6	9.2	3.7	8.3	2.9
29	.237	.47	.71	.95	.19	.42	.66	.90	.14	4.2	8.5	2.7	7.0	71.2
38 30	24.232	48.46	72.70	96.93	121.16	145.39	169.62	193.86	218.09	1453.9	2907.8	4361.7	5815.7	7269.6
31	.226	.45	.68	.91	.13	.36	.58	.82	8.04	3.6	7.1	60.7	4.3	7.9
32	.221	.44	.66	.88	.10	.32	.54	.77	7.99	3.2	6.5	59.7	3.0	6.2
33	.215	.43	.65	.86	.08	.29	.50	.73	.94	2.9	5.8	8.7	1.6	4.5
34	.210	.42	.63	.84	.05	.26	.46	.68	.89	2.6	5.2	7.7	10.3	2.9
38 35	24.204	48.40	72.61	96.81	121.02	145.22	169.43	193.63	217.83	1452.2	2904.5	4356.7	5808.9	7261.2
36	.198	.39	.60	.79	0.99	.19	.39	.59	.78	1.9	3.8	5.7	7.6	59.5
37	.193	.38	.58	.77	.96	.16	.35	.55	.73	1.6	3.1	4.7	6.3	7.8
38	.187	.37	.56	.75	.94	.12	.31	.50	.68	1.2	2.5	3.7	4.9	6.1
39	.182	.36	.55	.73	.91	.09	.27	.45	.63	0.9	1.8	2.7	3.6	4.5
38 40	24.176	48.35	72.53	96.70	120.88	145.06	169.23	193.41	217.58	1450.6	2901.1	4351.7	5802.2	7252.8
41	.170	.34	.51	.68	.85	5.02	.19	.37	.53	0.2	900.4	50.7	800.9	51.1
42	.165	.33	.49	.66	.82	4.99	.15	.32	.48	49.9	899.7	49.7	799.5	49.4
43	.159	.32	.48	.64	.80	.96	.11	.28	.43	9.6	9.1	8.6	8.2	7.7
44	.154	.31	.46	.61	.77	.92	.07	.23	.38	9.2	8.4	7.6	6.8	6.1
38 45	24.148	48.29	72.44	96.59	120.74	144.89	169.04	193.19	217.33	1448.9	2897.7	4346.6	5795.5	7244.4
46	.142	.28	.43	.57	.71	.85	9.00	.14	.28	8.5	7.0	5.6	4.1	2.7
47	.137	.27	.41	.55	.68	.82	8.96	.10	.23	8.2	6.4	4.6	2.8	41.0
48	.131	.26	.39	.52	.66	.79	.92	.05	.18	7.9	5.7	3.6	1.5	39.3
49	.125	.25	.38	.50	.63	.75	.88	3.01	.13	7.5	5.1	2.6	90.1	7.6
38 50	24.120	48.24	72.36	96.48	120.60	144.72	168.84	192.96	217.08	1447.2	2894.4	4341.6	5788.8	7236.0
51	.114	.23	.34	.46	.57	.69	.80	.92	7.03	6.9	3.7	40.6	7.4	4.3
52	.109	.22	.33	.43	.54	.65	.76	.87	6.98	6.5	3.0	39.6	6.1	2.6
53	.103	.21	.31	.41	.52	.62	.72	.83	.93	6.2	2.4	8.5	4.7	30.9
54	.097	.20	.29	.39	49	.58	.68	.78	.88	5.8	1.7	7.5	3.3	29.2
38 55	24.092	48.18	72.28	96.36	120.46	144.55	168.64	192.74	216.82	1445.5	2891.0	4336.5	5782.0	7227.5
56	.086	.17	.26	.34	.43	.52	.60	.69	.77	5.2	90.3	5.5	80.6	5.8
57	.080	.16	.24	.32	.40	.48	.56	.65	.72	4.8	89.6	4.5	79.3	4.1
58	.075	.15	.22	.30	.38	.45	.52	.60	.67	4.5	9.0	3.4	7.9	2.4
59	.069	.14	.21	.28	.35	.41	.48	.56	.62	4.1	8.3	2.4	6.6	20.7
38 60	24.063	48.13	72.19	96.25	120.32	144.38	168.44	192.51	216.57	1443.8	2887.6	4331.4	5775.2	7219.0

Lat.		Latitude 38° to 39°—Meridional arcs.						Latitude 38°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 38° 30′		Value of 1′	Continuous sums of minutes from latitude 38° 00′		Longitude.	X	Y
°	′	*Meters.*	″	*Meters.*	*Meters.*	′	*Meters.*	° ′	*Meters.*	*Meters.*
38	00	30.832			1849.90					
	1	2	1	30.83	.91	1	1 849.9	0 1	1 463.9	0.1
	2	2	2	61.67	.91	2	3 699.8	2	2 927.8	0.5
	3	2	3	92.50	.92	3	5 549.7	3	4 391.7	1.2
	4	2	4	123.34	.92	4	7 399.6	4	5 855.6	2.1
38	05	30.832	5	154.17	1849.93	5	9 249.6	0 5	7 319.6	3.3
	6	2	6	185.01	.93	6	11 099.5	6	8 783.5	4.7
	7	2	7	215.84	.94	7	12 949.4	7	10 247.4	6.4
	8	2	8	246.67	.94	8	14 799.4	8	11 711.3	8.4
	9	2	9	277.51	.95	9	16 649.3	9	13 175.2	10.6
38	10	30.833	10	308.34	1849.95	10	18 499.3	0 10	14 639.1	13.1
	11	3	1	339.18	.96	1	20 349.2	15	21 958.6	29.5
	12	3	2	370.01	.97	2	22 199.2	20	29 278.2	52.4
	13	3	3	400.85	.97	3	24 049.2	25	36 597.6	81.9
	14	3	4	431.68	.98	4	25 899.1	30	43 917.1	118.0
38	15	30.833	15	462.52	1849.98	15	27 749.1	0 35	51 236.5	160.6
	16	3	6	493.35	.99	6	29 599.1	40	58 555.9	209.8
	17	3	7	524.18	49.99	7	31 449.1	45	65 875.3	265.5
	18	3	8	555.02	50.00	8	33 299.1	50	73 194.6	327.7
	19	3	9	585.85	.00	9	35 149.1	55	80 513.8	396.5
38	20	30.833	20	616.69	1850.01	20	36 999.1	1 00	87 833.0	471.9
	21	4	1	647.52	.01	1	38 849.1	05	95 152.1	553.8
	22	4	2	678.36	.02	2	40 699.1	10	102 471.1	642.3
	23	4	3	709.19	.02	3	42 549.1	15	109 790.0	737.3
	24	4	4	740.02	.03	4	44 399.2	20	117 108.9	838.9
38	25	30.834	25	770.86	1850.03	25	46 249.2	1 25	124 427.6	947.1
	26	4	6	801.69	.04	6	48 099.2	30	131 746.3	1 061.8
	27	4	7	832.53	.05	7	49 949.3	35	139 064.8	1 183.0
	28	4	8	863.36	.05	8	51 799.3	40	146 383.3	1 310.8
	29	4	9	894.20	.06	9	53 649.4	45	153 701.6	1 445.2
38	30	30.834	30	925.03	1850.06	30	55 499.4	1 50	161 019.8	1 586.1
	31	4	1	955.87	.07	1	57 349.5	55	168 337.9	1 733.5
	32	5	2	986.70	.07	2	59 199.6	2 00	175 656	1 888
	33	5	3	1 017.53	.08	3	61 049.7	3 00	263 458	4 247
	34	5	4	1 048.37	.08	4	62 899.7	4 00	351 230	7 549
38	35	30.835	35	1 079.20	1850.09	35	64 749.8	5 00	438 962	11 795
	36	5	6	1 110.04	.09	6	66 599.9	6 00	526 643	16 983
	37	5	7	1 140.87	.10	7	68 450.0	7 00	614 263	23 112
	38	5	8	1 171.71	.10	8	70 300.1	8 00	701 812	30 183
	39	5	9	1 202.54	.11	9	72 150.2	9 00	789 280	38 195
38	40	30.835	40	1 233.37	1850.11	40	74 000.3	10 00	876 657	47 145
	41	5	1	1 264.21	.12	1	75 850.4	11 00	963 933	57 034
	42	5	2	1 295.04	.13	2	77 700.6	12 00	1 051 098	67 860
	43	6	3	1 325.88	.13	3	79 550.7	13 00	1 138 141	79 622
	44	6	4	1 356.71	.14	4	81 400.8	14 00	1 225 053	92 319
38	45	30.836	45	1 387.55	1850.14	45	83 251.0	15 00	1 311 823	105 949
	46	6	6	1 418.38	.15	6	85 101.1	16 00	1 398 441	120 511
	47	6	7	1 449.21	.15	7	86 951.3	17 00	1 484 899	136 002
	48	6	8	1 480.05	.16	8	88 801.4	18 00	1 571 185	152 421
	49	6	9	1 510.88	.16	9	90 651.6	19 00	1 657 289	169 767
38	50	30.836	50	1 541.72	1850.17	50	92 501.8	20 00	1 743 202	188 037
	51	6	1	1 572.55	.17	1	94 351.9	21 00	1 828 914	207 229
	52	6	2	1 603.39	.18	2	96 202.1	22 00	1 914 415	227 341
	53	6	3	1 634.22	.18	3	98 052.3	23 00	1 999 694	248 370
	54	6	4	1 665.06	.19	4	99 902.5	24 00	2 084 743	270 315
38	55	30.837	55	1 695.89	1850.20	55	101 752.7	25 00	2 169 551	293 172
	56	7	6	1 726.72	.20	6	103 602.9	26 00	2 254 109	316 939
	57	7	7	1 757.56	.21	7	105 453.1	27 00	2 338 406	341 613
	58	7	8	1 788.39	.21	8	107 303.3	28 00	2 422 433	367 192
	59	7	9	1 819.23	.22	9	109 153.5	29 00	2 506 181	393 672
38	60	30.837	60	1 850.06	1850.22	60	111 003.7	30 00	2 589 639	421 050

Latitude 39° to 40°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
39 00	24.063	48.13	72.19	96.25	120.32	144.38	168.44	192.51	216.57	1443.8	2887.6	4331.4	5775.2	7219.0
1	.058	.12	.17	.23	.29	.35	.40	.47	.52	3.5	6.9	30.4	3.9	7.4
2	.052	.11	.16	.21	.26	.31	.36	.42	.47	3.1	6.2	29.4	2.5	5.7
3	.047	.09	.14	.19	.23	.28	.32	.38	.42	2.8	5.6	8.4	71.2	4.0
4	.041	.08	.12	.16	.20	.25	.28	.33	.37	2.5	4.9	7.4	69.8	2.3
39 05	24.035	48.07	72.11	96.14	120.18	144 21	168.24	192.29	216.32	1442.1	2884.2	4326.3	5768.4	7210.6
6	.030	.06	.09	.12	.15	.18	.21	.24	.26	1.8	3.5	5.3	7.1	08.9
7	.024	.05	.07	.10	.12	.14	.17	.20	.21	1.4	2.8	4.3	5.7	7.2
8	.018	.03	.05	.07	.09	.11	.13	.15	.16	1.1	2.2	3.3	4.4	5.5
9	.013	.02	.04	.05	.06	.08	.09	.11	.11	0.8	1.5	2.3	3.0	3.8
39 10	24.007	48.01	72.02	96.03	120.03	144.04	168.05	192.06	216.06	1440.4	2880.8	4321.3	5761.7	7202.1
11	.001	8.00	2.00	6.01	20.01	4.01	8.01	2.01	6.01	40.1	80.1	20.2	60.3	200.4
12	3.996	7.99	1.99	5.98	19.97	3.97	7.97	1.97	5.96	39.7	79.4	19.2	58.9	198.7
13	.990	.98	.97	.96	.95	.94	.93	.92	.91	9.4	8.8	8.2	7.6	7.0
14	.984	.97	.95	.94	.92	.91	.89	.88	.86	9.1	8.1	7.2	6.2	5.3
39 15	23.979	47.96	71.94	95.91	119.89	143.87	167.85	191.83	215.80	1438.7	2877.4	4316.1	5754.9	7193.6
16	.973	.94	.92	.89	.86	.84	.81	.78	.75	8.4	6.7	5.1	3.5	1.9
17	.967	.93	.90	.87	.83	.80	.77	.74	.70	8.0	6.0	4.1	2.1	90.2
18	.962	.92	.88	.85	.81	.77	.73	.69	.65	7.7	5.4	3.1	50.8	88.5
19	.956	.91	.87	.82	.78	.74	.69	.65	.60	7.4	4.7	2.0	49.4	6.8
39 20	23.950	47.90	71.85	95.80	119.75	143.70	167.65	191.60	215.55	1437.0	2874.0	4311.0	5748.0	7185.1
21	.944	.89	.83	.78	.72	.67	.61	.56	.50	6.7	3.3	10.0	6.7	3.3
22	.939	.88	.82	.75	.69	.63	.57	.51	.45	6.3	2.6	09.0	5.3	81.6
23	.933	.87	.80	.73	.67	.60	.53	.47	.40	6.0	2.0	8.0	3.9	79.9
24	.927	.86	.78	.71	.64	.56	.49	.42	.35	5.6	1.3	6.9	2.6	8.2
39 25	23.922	47.84	71.77	95.69	119.61	143.53	167.45	191.38	215.29	1435.3	2870.6	4305.9	5741.2	7176.5
26	.916	.83	.75	.66	.58	.50	.41	.33	.24	5.0	69.9	4.9	39.8	4.8
27	.910	.82	.73	.64	.55	.46	.37	.29	.19	4.6	9.2	3.9	8.5	3.1
28	.905	.81	.71	.62	.53	.43	.33	.24	.14	4.3	8.6	2.8	7.1	71.4
29	.899	.80	.70	.60	.50	.39	.29	.20	.09	3.9	7.9	1.8	5.7	69.7
39 30	23.893	47.79	71.68	95.57	119.47	143.36	167.25	191.15	215.04	1433.6	2867.2	4300.8	5734.4	7168.0
31	.888	.78	.66	.55	.44	.33	.21	.10	4.99	3.3	6.5	299.8	3.0	6.3
32	.882	.77	.65	.53	.41	.29	.17	.06	.94	2.9	5.8	8.7	1.6	4.5
33	.876	.75	.63	.50	.38	.26	.13	1.01	.88	2.6	5.2	7.7	30.3	2.8
34	.870	.74	.61	.48	.35	.22	.09	0.97	.83	2.2	4.5	6.7	28.9	61.1
39 35	23.865	47.73	71.59	95.46	119.33	143.19	167.05	190.92	214.78	1431.9	2863.8	4295.6	5727.5	7159.4
36	.859	.72	.58	.44	.30	.16	7.01	.87	.73	1.6	3.1	4.6	6.1	7.7
37	.853	.71	.56	.42	.27	.12	6.97	.83	.68	1.2	2.4	3.6	4.8	6.0
38	.847	.69	.54	.39	.24	.09	.93	.78	.62	0.9	1.7	2.5	3.4	4.2
39	.842	.68	.53	.37	.21	.05	.89	.74	.57	0.5	1.0	1.5	2.0	2.5
39 40	23.836	47.67	71.51	95.35	119.18	143.02	166.85	190.69	214.52	1430.2	2860.3	4290.5	5720.7	7150.8
41	.830	.66	.49	.32	15	2.98	.81	.64	.47	29.8	59.6	89.5	19.3	49.1
42	.825	.65	.47	.30	.12	.95	.77	.60	.42	9.5	8.9	8.4	7.9	7.4
43	.819	.64	.46	.28	.09	.91	.73	.55	.37	9.1	8.3	7.4	6.5	5.6
44	.813	.63	.44	.25	.06	.88	.69	.51	.32	8.8	7.6	6.4	5.1	3.9
39 45	23.807	47.61	71.42	95.23	119.03	142.84	166.65	190.46	214.26	1428.4	2856.9	4285.3	5713.8	7142.2
46	.802	.60	.41	.21	9.01	.81	.61	.41	.21	8.1	6.2	4.3	2.4	40.5
47	.796	.59	.39	.18	8.98	.78	.57	.37	.16	7.8	5.5	3.3	11.0	38.8
48	.790	.58	.37	.16	.95	.74	.53	.32	.11	7.4	4.8	2.2	09.6	7.0
49	.784	.57	.35	.14	.92	.71	.49	.28	.06	7.1	4.1	1.2	8.3	5.3
39 50	23.779	47.56	71.34	95.11	118.89	142.67	166.45	190.23	214.01	1426.7	2853.4	4280.2	5706.9	7133.6
51	.773	.55	.32	.09	.86	.64	.41	.18	3.96	6.4	2.7	79.1	5.5	1.9
52	.767	.53	.30	.07	.83	.60	.37	.14	.91	6.0	2.0	8.1	4.1	30.1
53	.761	.52	.28	.04	.81	.57	.33	.09	.85	5.7	1.4	7.1	2.7	28.4
54	.756	.51	.27	5.02	.78	.53	.29	.05	.80	5.3	0.7	6.0	1.4	6.7
39 55	23.750	47.50	71.25	94.99	118.75	142.50	166.25	190.00	213.75	1425.0	2850.0	4275.0	5700.0	7125.0
56	.744	.49	.23	.97	.72	.47	.21	89.95	.70	4.7	49.3	3.9	698.6	3.2
57	.738	.48	.21	.95	.69	.43	.17	.91	.65	4.3	8.6	2.9	7.2	21.5
58	.733	.46	.20	.93	.67	.40	.13	.86	.59	4.0	7.9	1.9	5.8	19.8
59	.727	.45	.18	.90	.63	.36	.09	.81	.54	3.6	7.2	70.8	4.4	8.1
39 60	23.721	47.44	71.16	94.88	118.61	142.33	166.05	189.77	213.49	1423.3	2846.5	4269.8	5693.1	7116.3

Lat.		Latitude 39° to 40°—Meridional arcs.						Latitude 39°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 39° 30′		Value of 1′	Continuous sums of minutes from latitude 39° 00′		Longitude.	X	Y
°	′	Meters.	″	Meters.	Meters.	′	Meters.	° ′	Meters.	Meters.
39	00	30.837			1850.22					
	1	7	1	30.84	.23	1	1 850.2	0 1	1 443.8	0.1
	2	7	2	61.68	.23	2	3 700.5	2	2 887.6	0.5
	3	7	3	92.52	.24	3	5 550.7	3	4 331.4	1.2
	4	7	4	123.36	.24	4	7 400.9	4	5 775.2	2.1
39	05	30.837	5	154.20	1850.25	5	9 251.2	0 5	7 219.0	3.3
	6	8	6	185.04	.25	6	11 101.4	6	8 662.9	4.8
	7	8	7	215.88	.26	7	12 951.7	7	10 106.7	6.5
	8	8	8	246.72	.26	8	14 801.9	8	11 550.5	8.5
	9	8	9	277.56	.27	9	16 652.2	9	12 994.3	10.7
39	10	30.838	10	308.40	1850.28	10	18 502.5	0 10	14 438.1	13.2
	11	8	1	339.24	.28	1	20 352.8	15	21 657.1	29.7
	12	8	2	370.08	.29	2	22 203.0	20	28 876.1	52.9
	13	8	3	400.92	.29	3	24 053.3	25	36 095.1	82.6
	14	8	4	431.76	.30	4	25 903.6	30	43 314.1	118.9
39	15	30.838	15	462.60	1850.30	15	27 753.9	0 35	50 533.0	161.9
	16	8	6	493.44	.31	6	29 604.2	40	57 751.9	211.5
	17	9	7	524.28	.31	7	31 454.5	45	64 970.7	267.6
	18	9	8	555.11	.32	8	33 304.9	50	72 189.5	330.4
	19	9	9	585.95	.32	9	35 155.2	55	79 408.2	399.8
39	20	30.839	20	616.79	1850.33	20	37 005.5	1 00	86 626.9	475.8
	21	9	1	647.63	.33	1	38 855.8	05	93 845.4	558.4
	22	9	2	678.47	.34	2	40 706.2	10	101 063.9	647.6
	23	9	3	709.31	.35	3	42 556.5	15	108 282.4	743.4
	24	9	4	740.15	.35	4	44 406.9	20	115 500.7	845.8
39	25	30.839	25	770.99	1850.36	25	46 257.2	1 25	122 718.9	954.8
	26	9	6	801.83	.36	6	48 107.6	30	129 937.1	1 070.4
	27	9	7	832.67	.37	7	49 957.9	35	137 155.1	1 192.6
	28	40	8	863.51	.37	8	51 808.3	40	144 373.0	1 321.4
	29	0	9	894.35	.38	9	53 658.7	45	151 590.8	1 456.8
39	30	30.840	30	925.19	1850.38	30	55 509.1	1 50	158 808.4	1 598.8
	31	0	1	956.03	.39	1	57 359.4	55	166 025.9	1 747.5
	32	0	2	986.87	.39	2	59 209.8	2 00	173 243	1 903
	33	0	3	1 017.71	.40	3	61 060.2	3 00	259 839	4 281
	34	0	4	1 048.55	.40	4	62 910.6	4 00	346 403	7 611
39	35	30.840	35	1 079.39	1850.41	35	64 761.0	5 00	432 925	11 891
	36	0	6	1 110.23	.42	6	66 611.4	6 00	519 396	17 121
	37	0	7	1 141.07	.42	7	68 461.9	7 00	605 803	23 300
	38	0	8	1 171.91	.43	8	70 312.3	8 00	692 138	30 428
	39	1	9	1 202.75	.43	9	72 162.7	9 00	778 388	38 504
39	40	30.841	40	1 233.59	1850.44	40	74 013.2	10 00	864 545	47 527
	41	1	1	1 264.43	.44	1	75 863.6	11 00	950 598	57 496
	42	1	2	1 295.27	.45	2	77 714.0	12 00	1 036 536	68 409
	43	1	3	1 326.11	.45	3	79 564.5	13 00	1 122 349	80 266
	44	1	4	1 356.95	.46	4	81 414.9	14 00	1 208 027	93 064
39	45	30.841	45	1 387.79	1850.46	45	83 265.4	15 00	1 293 559	106 802
	46	1	6	1 418.63	.47	6	85 115.9	16 00	1 378 934	121 479
	47	1	7	1 449.47	.47	7	86 966.3	17 00	1 464 144	137 093
	48	1	8	1 480.31	.48	8	88 816.8	18 00	1 549 177	153 642
	49	1	9	1 511.15	.49	9	90 667.3	19 00	1 634 023	171 124
39	50	30.842	50	1 541.99	1850.49	50	92 517.8	20 00	1 718 671	189 537
	51	2	1	1 572.83	.50	1	94 368.3	21 00	1 803 113	208 878
	52	2	2	1 603.67	.50	2	96 218.8	22 00	1 887 337	229 146
	53	2	3	1 634.50	.51	3	98 069.3	23 00	1 971 333	250 337
	54	2	4	1 665.34	.51	4	99 919.8	24 00	2 055 091	272 450
39	55	30.842	55	1 696.18	1850.52	55	101 770.3	25 00	2 138 602	295 481
	56	2	6	1 727.02	.52	6	103 620.8	26 00	2 221 854	319 429
	57	2	7	1 757.86	.53	7	105 471.4	27 00	2 304 838	344 289
	58	2	8	1 788.70	.53	8	107 321.9	28 00	2 387 545	370 059
	59	2	9	1 819.54	.54	9	109 172.4	29 00	2 469 963	396 736
39	60	30.842	60	1 850.38	1850.54	60	111 023.0	30 00	2 552 084	424 317

Latitude 40° to 41°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
40 00	23.721	47.44	71.16	94.88	118.61	142.33	166.05	189.77	213.49	1423.3	2846.5	4269.8	5693.1	7116.3
1	.715	.43	.15	.86	.58	.29	6.01	.72	.44	2.9	5.8	8.8	1.7	4.6
2	.710	.42	.13	.84	.55	.26	5.97	.68	.39	2.6	5.1	7.7	90.3	2.9
3	.704	.41	.11	.82	.52	.22	.93	.63	.33	2.2	4.5	6.7	88.9	11.1
4	.698	.40	.09	.79	.49	.19	.89	.58	.28	1.9	3.8	5.6	7.5	09.4
40 05	23.692	47.38	71.08	94.77	118.46	142.15	165.84	189.54	213.23	1421.5	2843.1	4264.6	5686.1	7107.7
6	.686	.37	.06	.75	.44	.12	.80	.49	.18	1.2	2.4	3.6	4.7	5.9
7	.681	.36	.04	.72	.41	.08	.76	.45	.13	0.8	1.7	2.5	3.4	4.2
8	.675	.35	.02	.70	.38	.05	.72	.40	.07	0.5	1.0	1.5	2.0	2.5
9	.669	.34	1.01	.68	.35	2.01	.68	.35	3.02	20.1	40.3	60.4	80.6	100.7
40 10	23.663	47.33	70.99	94.65	118.32	141.98	165.64	189.31	212.97	1419.8	2839.6	4259.4	5679.2	7099.0
11	.658	.32	.97	.63	.29	.95	.60	.26	.92	9.5	8.9	8.4	7.8	7.3
12	.652	.30	.96	.61	.26	.91	.56	.21	.87	9.1	8.2	7.3	6.4	5.5
13	.646	.29	.94	.58	.23	.88	.52	.17	.81	8.8	7.5	6.3	5.0	3.8
14	.640	.28	.92	.56	.20	.84	.48	.12	.76	8.4	6.8	5.2	3.6	2.0
40 15	23.634	47.27	70.90	94.54	118.18	141.81	165.44	189.07	212.71	1418.1	2836.1	4254.2	5672.2	7090.3
16	.629	.26	.89	.51	.15	.77	.40	9.03	.66	7.7	5.4	3.1	70.9	88.6
17	.623	.25	.87	.49	.12	.74	.36	8.98	.61	7.4	4.7	2.1	69.5	6.8
18	.617	.23	.85	.47	.09	.70	.32	.94	.55	7.0	4.0	1.1	8.1	5.1
19	.611	.22	.83	.44	.06	.67	.28	.89	.50	6.7	3.3	50.0	6.7	3.4
40 20	23.605	47.21	70.82	94.42	118.03	141.63	165.24	188.84	212.45	1416.3	2832.6	4249.0	5665.3	7081.6
21	.600	.20	.80	.40	8.00	.60	.20	.80	.40	6.0	1.9	7.9	3.9	79.9
22	.594	.19	.78	.37	7.97	.56	.16	.75	.34	5.6	1.2	6.9	2.5	8.1
23	.588	.18	.76	.35	.94	.53	.12	.70	.29	5.3	30.6	5.8	61.1	6.4
24	.582	.16	.75	.33	.91	.49	.08	.66	.24	4.9	29.9	4.8	59.7	4.6
40 25	23.576	47.15	70.73	94.31	117.89	141.46	165.03	188.61	212.18	1414.6	2829.2	4243.7	5658.3	7072.9
26	.570	.14	.71	.28	.85	.42	4.99	.56	.13	4.2	8.5	2.7	6.9	71.1
27	.565	.13	.69	.26	.83	.39	.95	.52	.08	3.9	7.8	1.6	5.5	69.4
28	.559	.12	.68	.24	.80	.35	.91	.47	2.03	3.5	7.1	40.6	4.1	7.7
29	.553	.10	.66	.21	.77	.32	.87	.42	1.97	3.2	6.4	39.5	2.7	5.9
40 30	23.547	47.09	70.64	94.19	117.74	141.28	164.83	188.38	211.92	1412.8	2825.7	4238.5	5651.3	7064.2
31	.541	.08	.62	.17	.71	.25	.79	.33	.87	2.5	5.0	7.4	49.9	2.4
32	.536	.07	.61	.14	.68	.21	.75	.28	.82	2.1	4.3	6.4	8.5	60.7
33	.530	.06	.59	.12	.65	.18	.71	.24	.76	1.8	3.6	5.3	7.1	58.9
34	.524	.05	.57	.10	.62	.14	.67	.19	.71	1.4	2.9	4.3	5.7	7.2
40 35	23.518	47.04	70.55	94.07	117.59	141.11	164.63	188.14	211.66	1411.1	2822.2	4233.2	5644.3	7055.4
36	.512	.02	.54	.05	.56	.07	.58	.10	.61	0.7	1.5	2.2	2.9	3.7
37	.506	.01	.52	.03	.53	.04	.54	.05	.56	0.4	0.8	1.1	1.5	1.9
38	.501	7.00	.50	4.00	.50	1.00	.50	8.00	.50	10.0	20.1	30.1	40.1	50.2
39	.495	6.99	.48	3.98	.47	0.97	.46	7.96	.45	09.7	19.4	29.0	38.7	48.4
40 40	23.489	46.98	70.47	93.96	117.44	140.93	164.42	187.91	211.40	1409.3	2818.7	4228.0	5637.3	7046.7
41	.483	.97	.45	.93	.41	.90	.38	.86	.35	9.0	8.0	6.9	5.9	4.9
42	.477	.95	.43	.91	.38	.86	.34	.82	.29	8.6	7.3	5.9	4.5	3.1
43	.471	.94	.41	.88	.35	.83	.30	.77	.24	8.3	6.5	4.8	3.1	41.4
44	.465	.93	.40	.86	.32	.79	.26	.72	.19	7.9	5.8	3.8	1.7	39.6
40 45	23.460	46.92	70.38	93.84	117.30	140.76	164.22	187.68	211.13	1407.6	2815.1	4222.7	5630.3	7037.9
46	.454	.91	.36	.81	.27	.72	.17	.63	.08	7.2	4.4	1.7	28.9	6.1
47	.448	.90	.34	.79	.24	.69	.13	.58	1.03	6.9	3.7	20.6	7.5	4.4
48	.442	.88	.33	.77	.21	.65	.09	.54	0.98	6.5	3.0	19.6	6.1	2.6
49	.436	.87	.31	.74	.18	.62	.05	.49	.92	6.2	2.3	8.5	4.7	30.8
40 50	23.430	46.86	70.29	93.72	117.15	140.58	164.01	187.44	210.87	1405.8	2811.6	4217.5	5623.3	7029.1
51	.424	.85	.27	.70	.12	.55	3.97	.40	.82	5.5	0.9	6.4	1.9	7.3
52	.419	.84	.26	.67	.09	.51	.93	.35	.77	5.1	10.2	5.3	20.4	5.6
53	.413	.83	.24	.65	.06	.48	.89	.30	.71	4.8	09.5	4.3	19.0	3.8
54	.407	.81	.22	.63	.03	.44	.85	.25	.66	4.4	8.8	3.2	7.6	2.0
40 55	23.401	46.80	70.20	93.60	117.01	140.41	163.81	187.21	210.61	1404.1	2808.1	4212.2	5616.2	7020.3
56	.395	.79	.18	.58	6.98	.37	.76	.16	.55	3.7	7.4	1.1	4.8	18.5
57	.389	.78	.17	.56	.95	.33	.72	.11	.50	3.3	6.7	10.0	3.4	6.7
58	.383	.77	.15	.53	.92	.30	.68	.07	.45	3.0	6.0	09.0	2.0	5.0
59	.377	.75	.13	.51	.89	.26	.64	7.02	.39	2.6	5.3	7.9	10.6	3.2
40 60	23.372	46.74	70.11	93.49	116.86	140.23	163.60	186.97	210.34	1402.3	2804.6	4206.9	5609.2	7011.5

Lat.		Latitude 40° to 41°—Meridional arcs.						Latitude 40°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 40° 30′		Value of 1′	Continuous sums of minutes from latitude 40° 00′		Longitude.	X	Y
°	′	Meters.	″	Meters.	Meters.	′	Meters.	° ′	Meters.	Meters.
40	00	30.842			1850.54					
	1	2	1	30.85	.55	1	1 850.5	0 1	1 423.3	0.1
	2	3	2	61.69	.56	2	3 701.1	2	2 846.5	0.5
	3	3	3	92.54	.56	3	5 551.7	3	4 269.8	1.2
	4	3	4	123.38	.57	4	7 402.2	4	5 693.0	2.1
40	05	30.843	5	154.23	1850.57	5	9 252.8	0 5	7 116.3	3.3
	6	3	6	185.07	.58	6	11 103.4	6	8 539.6	4.8
	7	3	7	215.92	.58	7	12 953.9	7	9 962.8	6.5
	8	3	8	246.76	.59	8	14 804.5	8	11 386.1	8.5
	9	3	9	277.61	.59	9	16 655.1	9	12 809.3	10.8
40	10	30.843	10	308.45	1850.60	10	18 505.7	0 10	14 232.6	13.3
	11	3	1	339.30	.60	1	20 356.3	15	21 349.0	29.9
	12	3	2	370.14	.61	2	22 206.9	20	28 465.3	53.2
	13	4	3	400.99	.61	3	24 057.5	25	35 581.6	83.2
	14	4	4	431.83	.62	4	25 908.2	30	42 697.8	119.8
40	15	30.844	15	462.68	1850.63	15	27 758.8	0 35	49 814.0	163.0
	16	4	6	493.52	.63	6	29 609.4	40	56 930.2	212.9
	17	4	7	524.37	.64	7	31 460.0	45	64 046.3	269.4
	18	4	8	555.21	.64	8	33 310.7	50	71 162.4	332.6
	19	4	9	586.06	.65	9	35 161.3	55	78 278.4	402.5
40	20	30.844	20	616.90	1850.65	20	37 012.0	1 00	85 394.3	479.0
	21	4	1	647.75	.66	1	38 862.6	05	92 510.1	562.2
	22	4	2	678.59	.66	2	40 713.3	10	99 625.9	652.0
	23	4	3	709.44	.67	3	42 564.0	15	106 741.6	748.5
	24	5	4	740.28	.67	4	44 414.6	20	113 857.2	851.6
40	25	30.845	25	771.13	1850.68	25	46 265.3	1 25	120 972.7	961.4
	26	5	6	801.97	.68	6	48 116.0	30	128 088.1	1 077.8
	27	5	7	832.82	.69	7	49 966.7	35	135 203.4	1 200.8
	28	5	8	863.66	.70	8	51 817.4	40	142 318.5	1 330.5
	29	5	9	894.51	.70	9	53 668.1	45	149 433.6	1 466.9
40	30	30.845	30	925.35	1850.71	30	55 518.8	1 50	156 548.5	1 609.9
	31	5	1	956.20	.71	1	57 369.5	55	163 663.3	1 759.6
	32	5	2	987.04	.72	2	59 220.2	2 00	170 778	1 916
	33	5	3	1 017.89	.72	3	61 070.9	3 00	256 140	4 311
	34	5	4	1 048.73	.73	4	62 921.6	4 00	341 470	7 663
40	35	30.846	35	1 079.58	1850.73	35	64 772.4	5 00	426 757	11 972
	36	6	6	1 110.42	.74	6	66 623.1	6 00	511 990	17 238
	37	6	7	1 141.27	.74	7	68 473.8	7 00	597 158	23 460
	38	6	8	1 172.11	.75	8	70 324.6	8 00	682 252	30 637
	39	6	9	1 202.96	.76	9	72 175.3	9 00	767 260	38 768
40	40	30.846	40	1 233.80	1850.76	40	74 026.1	10 00	852 171	47 852
	41	6	1	1 264.65	.77	1	75 876.9	11 00	936 975	57 888
	42	6	2	1 295.49	.77	2	77 727.6	12 00	1 021 661	68 875
	43	6	3	1 326.34	.78	3	79 578.4	13 00	1 106 218	80 811
	44	6	4	1 357.18	.78	4	81 429.2	14 00	1 190 636	93 695
40	45	30.846	45	1 388.03	1850.79	45	83 280.0	15 00	1 274 904	107 525
	46	7	6	1 418.88	.79	6	85 130.8	16 00	1 359 012	122 300
	47	7	7	1 449.72	.80	7	86 981.6	17 00	1 442 949	138 017
	48	7	8	1 480.57	.80	8	88 832.4	18 00	1 526 704	154 675
	49	7	9	1 511.41	.81	9	90 683.2	19 00	1 610 267	172 272
40	50	30.847	50	1 542.26	1850.81	50	92 534.0	20 00	1 693 628	190 805
	51	7	1	1 573.10	.82	1	94 384.8	21 00	1 776 775	210 272
	52	7	2	1 603.95	.83	2	96 235.6	22 00	1 859 698	230 671
	53	7	3	1 634.79	.83	3	98 086.5	23 00	1 942 387	251 998
	54	7	4	1 665.64	.84	4	99 937.3	24 00	2 024 833	274 252
40	55	30.847	55	1 696.48	1850.84	55	101 788.1	25 00	2 107 023	297 430
	56	7	6	1 727.33	.85	6	103 639.0	26 00	2 188 948	321 528
	57	8	7	1 758.17	.85	7	105 489.8	27 00	2 270 597	346 543
	58	8	8	1 789.02	.86	8	107 340.7	28 00	2 351 961	372 473
	59	8	9	1 819.86	.86	9	109 191.5	29 00	2 433 029	399 314
40	60	30.848	60	1 850.71	1850.87	60	111 042.4	30 00	2 513 790	427 063

Latitude 41° to 42°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
41 00	23.372	46.74	70.11	93.49	116.86	140.23	163.60	186.97	210.34	1402.3	2804.6	4206.9	5609.2	7011.5
1	.366	.73	.10	.46	.83	.19	.56	.92	.29	1.9	3.9	5.8	7.7	009.7
2	.360	.72	.08	.44	.80	.16	.52	.88	.23	1.6	3.2	4.7	6.3	7.9
3	.354	.71	.06	.41	.77	.12	.48	.83	.18	1.2	2.4	3.7	4.9	6.1
4	.348	.70	.04	.39	.74	.09	.44	.78	.13	0.9	1.7	2.6	3.5	4.4
41 05	23.342	46.68	70.03	93.37	116.71	140.05	163.39	186.74	210.08	1400.5	2801.0	4201.6	5602.1	7002.6
6	.336	.67	70.01	.34	.68	40.02	.35	.69	10.02	400.2	800.3	200.5	600.7	7000.8
7	.330	.66	69.99	.32	.65	39.98	.31	.64	09.97	399.8	799.6	199.4	599.2	6999.1
8	.324	.65	.97	.30	.62	.95	.27	.59	.92	9.5	8.9	8.4	7.8	7.3
9	.318	.64	.96	.27	.59	.91	.23	.55	.86	9.1	8.2	7.3	6.4	5.5
41 10	23.313	46.63	69.94	93.25	116.56	139.88	163.19	186.50	209.81	1398.8	2797.5	4196.3	5595.0	6993.8
11	.307	.61	.92	.23	.53	.84	.15	.45	.76	8.4	6.8	5.2	3.6	2.0
12	.301	.60	.90	.20	.50	.80	.11	.41	.71	8.0	6.1	4.1	2.2	90.2
13	.295	.59	.88	.18	.47	.77	.06	.36	.65	7.7	5.4	3.1	90.7	88.4
14	.289	.58	.87	.16	.44	.73	3.02	.31	.60	7.3	4.7	2.0	89.3	6.7
41 15	23.283	46.57	69.85	93.13	116.42	139.70	162.98	186.26	209.54	1397.0	2794.0	4190.9	5587.9	6984.9
16	.277	.55	.83	.11	.39	.66	.94	.22	.49	6.6	3.3	89.9	6.5	3.1
17	.271	.54	.81	.08	.36	.63	.90	.17	.44	6.3	2.5	8.8	5.0	81.3
18	.265	.53	.80	.06	.33	.59	.86	.12	.39	5.9	1.8	7.7	3.6	79.6
19	.259	.52	.78	.04	.30	.56	.81	.07	.33	5.6	1.1	6.7	2.2	7.8
41 20	23.253	46.51	69.76	93.01	116.27	139.52	162.77	186.03	209.28	1395.2	2790.4	4185.6	5580.8	6976.0
21	.247	.49	.74	2.99	.23	.48	.72	5.97	.22	4.8	89.7	4.5	79.4	4.2
22	.241	.48	.72	.97	.21	.45	.69	.93	.17	4.5	9.0	3.5	8.0	2.4
23	.236	.47	.71	.94	.18	.41	.65	.88	.12	4.1	8.2	2.4	6.5	70.7
24	.230	.46	.69	.92	.15	.38	.61	.84	.07	3.8	7.5	1.3	5.1	68.9
41 25	23.224	46.45	69.67	92.89	116.12	139.34	162.56	185.79	209.01	1393.4	2786.8	4180.3	5573.7	6967.1
26	.218	.44	.65	.87	.09	.31	.52	.74	8.96	3.1	6.1	79.2	2.3	5.3
27	.212	.42	.63	.85	.06	.27	.48	.69	.91	2.7	5.4	8.1	70.8	3.5
28	.206	.41	.62	.82	.03	.24	.44	.65	.85	2.4	4.7	7.1	69.4	1.8
29	.200	.40	.60	.80	6.00	.20	.40	.60	.80	2.0	4.0	6.0	8.0	60.0
41 30	23.194	46.39	69.58	92.78	115.97	139.16	162.36	185.55	208.75	1391.6	2783.3	4174.9	5566.6	6958.2
31	.188	.38	.56	.75	.94	.13	.32	.50	.69	1.3	2.6	3.8	5.1	6.4
32	.182	.36	.55	.73	.91	.09	.28	.46	.64	0.9	1.9	2.8	3.7	4.6
33	.176	.35	.53	.70	.88	.06	.23	.41	.58	0.6	1.1	1.7	2.3	2.8
34	.170	.34	.51	.68	.85	9.02	.19	.36	.53	90.2	80.4	70.7	60.8	51.1
41 35	23.164	46.33	69.49	92.66	115.82	138.99	162.15	185.31	208.48	1389.9	2779.7	4169.6	5559.4	6949.3
36	.158	.32	.47	.63	.79	.95	.11	.27	.43	9.5	9.0	8.5	8.0	7.5
37	.152	.30	.46	.61	.76	.91	.07	.22	.37	9.1	8.3	7.4	6.6	5.7
38	.146	.29	.44	.59	.73	.88	2.02	.17	.32	8.8	7.5	6.3	5.1	3.9
39	.140	.28	.42	.56	.70	.84	1.98	.12	.26	8.4	6.8	5.3	3.7	2.1
41 40	23.134	46.27	69.40	92.54	115.67	138.81	161.94	185.08	208.21	1388.1	2776.1	4164.2	5552.3	6940.3
41	.128	.26	.38	.51	.64	.77	.90	5.03	.16	7.7	5.4	3.1	50.8	38.5
42	.122	.24	.37	.49	.61	.73	.86	4.98	.10	7.3	4.7	2.0	49.4	6.7
43	.117	.23	.35	.47	.58	.70	.82	.93	8.05	7.0	4.0	61.0	8.0	5.0
44	.111	.22	.33	.44	.55	.66	.77	.88	7.99	6.6	3.2	59.9	6.5	3.2
41 45	23.105	46.21	69.31	92.42	115.52	138.63	161.73	184.84	207.94	1386.3	2772.5	4158.8	5545.1	6931.4
46	.099	.20	.30	.39	.49	.59	.69	.79	.89	5.9	1.8	7.7	3.7	29.6
47	.093	.19	.28	.37	.46	.56	.65	.74	.83	5.6	1.1	6.7	2.2	7.8
48	.087	.17	.26	.35	.43	.52	.61	.69	.78	5.2	70.4	5.6	40.8	6.0
49	.081	.16	.24	.32	.40	.48	.56	.65	.72	4.8	69.7	4.5	39.4	4.2
41 50	23.075	46.15	69.22	92.30	115.37	138.45	161.52	184.60	207.67	1384.5	2769.0	4153.4	5537.9	6922.4
51	.069	.14	.21	.27	.34	.41	.48	.55	.62	4.1	8.3	2.4	6.5	20.6
52	.063	.13	.19	.25	.31	.38	.44	.50	.56	3.8	7.5	1.3	5.0	18.8
53	.057	.11	.17	.23	.28	.34	.40	.45	.51	3.4	6.8	50.2	3.6	7.0
54	.051	.10	.15	.20	.25	.30	.35	.41	.45	3.0	6.1	49.1	2.2	5.2
41 55	23.045	46.09	69.13	92.18	115.22	138.27	161.31	184.36	207.40	1382.7	2765.4	4148.0	5530.7	6913.4
56	.039	.08	.12	.16	.19	.23	.27	.31	.35	2.3	4.7	7.0	29.3	11.6
57	.033	.07	.10	.13	.16	.20	.23	.26	.29	2.0	3.9	5.9	7.8	09.8
58	.027	.05	.08	.11	.13	.16	.19	.21	.24	1.6	3.2	4.8	6.4	8.0
59	.021	.04	.06	.08	.10	.12	.14	.17	.18	1.2	2.5	3.7	5.0	6.2
41 60	23.015	46.03	69.04	92.06	115.07	138.09	161.10	184.12	207.13	1380.9	2761.8	4142.7	5523.5	6904.4

Lat.		Latitude 41° to 42°—Meridional arcs.						Latitude 41°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 41° 30′		Value of 1′	Continuous sums of minutes from latitude 41° 00′		Longitude.	X	Y
°	′	*Meters.*	″	*Meters.*	*Meters.*	′	*Meters.*	° ′	*Meters.*	*Meters.*
41	00	30.848			1850.87					
	1	8	1	30.85	.87	1	1 850.9	0 1	1 402.3	0.1
	2	8	2	61.70	.88	2	3 701.7	2	2 804.6	0.5
	3	8	3	92.55	.89	3	5 552.6	3	4 206.9	1.2
	4	8	4	123.40	.89	4	7 403.5	4	5 609.2	2.1
41	05	30.848	5	154.25	1850.90	5	9 254.4	0 5	7 011.5	3.3
	6	8	6	185.10	.90	6	11 105.3	6	8 413.7	4.8
	7	8	7	215.95	.91	7	12 956.2	7	9 816.0	6.6
	8	9	8	246.80	.91	8	14 807.1	8	11 218.3	8.6
	9	9	9	277.65	.92	9	16 658.0	9	12 620.6	10.8
41	10	30.849	10	308.51	1850.92	10	18 509.0	0 10	14 022.9	13.4
	11	9	1	339.36	.93	11	20 359.9	15	21 034.3	30.1
	12	9	2	370.21	.93	12	22 210.8	20	28 045.7	53.5
	13	9	3	401.06	.94	13	24 061.8	25	35 057.1	83.6
	14	9	4	431.91	.95	14	25 912.7	30	42 068.5	120.4
41	15	30.849	15	462.76	1850.95	15	27 763.7	0 35	49 079.8	163.9
	16	9	6	493.61	.96	16	29 614.6	40	56 091.1	214.1
	17	9	7	524.46	.96	17	31 465.6	45	63 102.3	270.9
	18	49	8	555.31	.97	18	33 316.5	50	70 113.5	334.5
	19	50	9	586.16	.97	19	35 167.5	55	77 124.6	404.7
41	20	30.850	20	617.01	1850.98	20	37 018.5	1 00	84 135.6	481.7
	21	0	1	647.86	.98	21	38 869.5	05	91 146.6	565.3
	22	0	2	678.71	.99	22	40 720.4	10	98 157.4	655.6
	23	0	3	709.56	0.99	23	42 571.4	15	105 168.2	752.6
	24	0	4	740.41	1.00	24	44 422.4	20	112 178.9	856.3
41	25	30.850	25	771.26	1851.01	25	46 273.4	1 25	119 189.5	966.7
	26	0	6	802.11	.01	26	48 124.4	30	126 200.0	1 083.8
	27	0	7	832.96	.02	27	49 975.4	35	133 210.3	1 207.6
	28	0	8	863.82	.02	28	51 826.5	40	140 220.6	1 338.0
	29	0	9	894.67	.03	29	53 677.5	45	147 230.7	1 475.1
41	30	30.851	30	925.52	1851.03	30	55 528.5	1 50	154 240.7	1 619.0
	31	1	1	956.37	.04	31	57 379.6	55	161 250.5	1 769.5
	32	1	2	987.22	.04	32	59 230.6	2 00	168 260	1 927
	33	1	3	1 018.07	.05	33	61 081.6	3 00	252 363	4 335
	34	1	4	1 048.92	.05	34	62 932.7	4 00	336 432	7 706
41	35	30.851	35	1 079.77	1851.06	35	64 783.8	5 00	420 457	12 039
	36	1	6	1 110.62	.07	36	66 634.8	6 00	504 428	17 335
	37	1	7	1 141.47	.07	37	68 485.9	7 00	588 332	23 591
	38	1	8	1 172.32	.08	38	70 337.0	8 00	672 159	30 807
	39	1	9	1 203.17	.08	39	72 188.0	9 00	755 897	38 983
41	40	30.851	40	1 234.02	1851.09	40	74 039.1	10 00	839 537	48 118
	41	2	1	1 264.87	.09	41	75 890.2	11 00	923 067	58 209
	42	2	2	1 295.72	.10	42	77 741.3	12 00	1 006 475	69 256
	43	2	3	1 326.57	.10	43	79 592.4	13 00	1 089 752	81 258
	44	2	4	1 357.42	.11	44	81 443.5	14 00	1 172 886	94 212
41	45	30.852	45	1 388.27	1851.11	45	83 294.6	15 00	1 255 866	108 117
	46	2	6	1 419.12	.12	46	85 145.7	16 00	1 338 681	122 971
	47	2	7	1 449.98	.12	47	86 996.9	17 00	1 421 321	138 773
	48	2	8	1 480.83	.13	48	88 848.0	18 00	1 503 775	155 520
	49	2	9	1 511.68	.14	49	90 699.1	19 00	1 586 031	173 210
41	50	30.852	50	1 542.53	1851.14	50	92 550.3	20 00	1 668 079	191 841
	51	2	1	1 573.38	.15	51	94 401.4	21 00	1 749 909	211 409
	52	3	2	1 604.23	.15	52	96 252.5	22 00	1 831 509	231 914
	53	3	3	1 635.08	.16	53	98 103.7	23 00	1 912 869	253 352
	54	3	4	1 665.93	.16	54	99 954.9	24 00	1 993 978	275 719
41	55	30.853	55	1 696.78	1851.17	55	101 806.0	25 00	2 074 826	299 014
	56	3	6	1 727.63	.17	56	103 657.2	26 00	2 155 402	323 233
	57	3	7	1 758.48	.18	57	105 508.4	27 00	2 235 695	348 374
	58	3	8	1 789.33	.18	58	107 359.6	28 00	2 315 695	374 432
	59	3	9	1 820.18	.19	59	109 210.7	29 00	2 395 392	401 404
41	60	30.853	60	1 851.03	1851.20	60	111 061.9	30 00	2 474 774	429 287

Latitude 42° to 43°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
42 00	23.015	46.03	69.04	92.06	115.07	138.09	161.10	184.12	207.13	1380.9	2761.8	4142.7	5523.5	6904.4
1	.009	.02	.03	.04	.04	.05	.06	.07	.08	0.5	1.1	1.6	2.1	2.6
2	.003	6.01	9.01	2.01	5.01	8.02	1.02	4.02	7.02	0.2	60.4	40.5	20.6	900.8
3	2.997	5.99	8.99	1.99	4.98	7.98	0.98	3.97	6.97	79.8	59.6	39.4	19.2	899.0
4	.991	.98	.97	.96	.95	.94	.93	.93	.91	9.4	8.9	8.3	7.8	7.2
42 05	22.985	45.97	68.95	91.94	114.92	137.91	160.89	183.88	206.86	1379.1	2758.2	4137.2	5516.3	6895.4
6	.979	.96	.94	.92	.89	.87	.85	.83	.81	8.7	7.5	6.2	4.9	3.6
7	.973	.95	.92	.89	.86	.84	.81	.78	.75	8.4	6.7	5.1	3.4	1.8
8	.967	.93	.90	.87	.83	.80	.76	.73	.70	8.0	6.0	4.0	2.0	90.0
9	.961	.92	.88	.84	.80	.76	.72	.68	.64	7.6	5.2	2.9	10.5	88.2
42 10	22.955	45.91	68.86	91.82	114.77	137.73	160.68	183.64	206.59	1377.3	2754.5	4131.8	5509.1	6886.4
11	.949	.90	.85	.79	.74	.69	.64	.59	.54	6.9	3.8	30.7	7.6	4.6
12	.942	.88	.83	.77	.71	.65	.60	.54	.48	6.5	3.1	29.6	6.2	2.7
13	.936	.87	.81	.75	.68	.62	.55	.49	.43	6.2	2.3	8.6	4.7	80.9
14	.930	.86	.79	.72	.65	.58	.51	.44	.37	5.8	1.6	7.5	3.3	79.1
42 15	22.924	45.85	68.77	91.70	114.62	137.55	160.47	183.40	206.32	1375.5	2750.9	4126.4	5501.9	6877.3
16	.918	.84	.75	.67	.59	.51	.43	.35	.27	5.1	50.2	5.3	500.4	5.5
17	.912	.82	.74	.65	.56	.47	.39	.30	.21	4.7	49.5	4.2	499.0	3.7
18	.906	.81	.72	.62	.53	.44	.34	.25	.16	4.4	8.7	3.1	7.5	1.9
19	.900	.80	.70	.60	.50	.40	.30	.20	.10	4.0	8.0	2.0	6.1	70.1
42 20	22.894	45.79	68.68	91.58	114.47	137.37	160.26	183.15	206.05	1373.7	2747.3	4121.0	5494.6	6868.3
21	.888	.78	.66	.55	.44	.33	.22	.11	6.00	3.3	6.6	19.9	3.2	6.4
22	.882	.76	.65	.53	.41	.29	.18	.06	5.94	2.9	5.9	8.8	1.7	4.6
23	.876	.75	.63	.50	.38	.26	.13	3.01	.89	2.6	5.1	7.7	90.2	2.8
24	.870	.74	.61	.48	.35	.22	.09	2.96	.83	2.2	4.4	6.6	88.8	61.0
42 25	22.864	45.73	68.59	91.46	114.32	137.18	160.05	182.91	205.78	1371.8	2743.7	4115.5	5487.3	6859.2
26	.858	.72	.57	.43	.29	.15	60.01	.86	.72	1.5	3.0	4.4	5.9	7.4
27	.852	.70	.56	.41	.26	.11	59.97	.81	.67	1.1	2.2	3.3	4.4	5.6
28	.846	.69	.54	.38	.23	.07	.92	.77	.61	0.7	1.5	2.2	3.0	3.7
29	.840	.68	.52	.36	.20	.04	.88	.72	.56	0.4	0.7	1.2	1.5	1.9
42 30	22.834	45.67	68.50	91.33	114.17	137.00	159.84	182.67	205.50	1370.0	2740.0	4110.1	5480.1	6850.1
31	.828	.66	.48	.31	.14	6.97	.80	.62	.45	69.7	39.3	09.0	78.6	48.3
32	.822	.64	.46	.29	.11	.93	.75	.57	.39	9.3	8.6	7.9	7.2	6.5
33	.815	.63	.45	.26	.08	.89	.71	.52	.34	8.9	7.8	6.8	5.7	4.6
34	.809	.62	.43	.24	.05	.86	.67	.48	.28	8.6	7.1	5.7	4.3	2.8
42 35	22.803	45.61	68.41	91.21	114.02	136.82	159.62	182.43	205.23	1368.2	2736.4	4104.6	5472.8	6841.0
36	.797	.59	.39	.19	3.99	.78	.58	.38	.17	7.8	5.7	3.5	71.3	39.2
37	.791	.58	.37	.17	.96	.75	.54	.33	.12	7.5	5.0	2.4	69.9	7.4
38	.785	.57	.36	.14	.93	.71	.50	.28	.07	7.1	4.2	1.3	8.4	5.5
39	.779	.56	.34	.12	.90	.67	.45	.23	5.01	6.7	3.5	100.2	7.0	3.7
42 40	22.773	45.55	68.32	91.09	113.87	136.64	159.41	182.18	204.96	1366.4	2732.8	4099.1	5465.5	6831.9
41	.767	.53	.30	.07	.84	.60	.37	.14	.90	6.0	2.0	8.0	4.0	30.1
42	.761	.52	.28	.04	.81	.56	.32	.09	.85	5.6	1.3	6.9	2.6	28.2
43	.755	.51	.26	1.02	.77	.53	.28	2.04	.79	5.3	30.6	5.8	61.1	6.4
44	.749	.50	.25	0.99	.75	.49	.24	1.99	.74	4.9	29.8	4.7	59.7	4.6
42 45	22.742	45.48	68.23	90.97	113.71	136.45	159.19	181.94	204.68	1364.5	2729.1	4093.6	5458.2	6822.7
46	.736	.47	.21	.95	.68	.42	.15	.89	.63	4.2	8.4	2.6	6.7	20.9
47	.730	.46	.19	.92	.65	.38	.11	.84	.57	3.8	7.6	1.5	5.3	19.1
48	.724	.45	.17	.90	.62	.35	.07	.79	.52	3.5	6.9	90.4	3.8	7.3
49	.718	.44	.15	.87	.59	.31	9.02	.74	.46	3.1	6.1	89.3	2.3	5.4
42 50	22.712	45.42	68.14	90.85	113.56	136.27	158.98	181.70	204.41	1362.7	2725.4	4088.2	5450.9	6813.6
51	.706	.41	.12	.82	.53	.24	.94	.65	.36	2.4	4.7	7.1	49.4	11.8
52	.700	.40	.10	.80	.50	.20	.90	.60	.30	2.0	4.0	6.0	7.9	09.9
53	.694	.39	.08	.77	.47	.16	.86	.55	.24	1.6	3.2	4.9	6.5	8.1
54	.688	.38	.06	.75	.44	.13	.81	.50	.19	1.3	2.5	3.8	5.0	6.3
42 55	22.681	45.36	68.04	90.73	113.40	136.09	158.77	181.45	204.14	1360.9	2721.8	4082.7	5443.5	6804.4
56	.675	.35	.03	.70	.38	.05	.73	.40	.08	0.5	1.1	1.6	2.1	2.6
57	.669	.34	8.01	.68	.35	6.02	.69	.35	4.02	60.2	20.3	80.5	40.6	800.8
58	.663	.33	7.99	.65	.31	5.98	.64	.30	3.96	59.8	19.6	79.4	39.1	798.9
59	.657	.31	.97	.63	.28	.94	.60	.26	.91	9.4	8.8	8.3	7.7	7.1
42 60	22.651	45.30	67.95	90.60	113.25	135.91	158.56	181.21	203.86	1359.1	2718.1	4077.2	5436.2	6795.3

Lat.		Latitude 42° to 43°—Meridional arcs.						Latitude 42°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 42° 30′		Value of 1′	Continuous sums of minutes from latitude 42° 00′		Longitude.	X	Y
°	′	*Meters.*	″	*Meters.*	*Meters.*	′	*Meters.*	° ′	*Meters.*	*Meters.*
42	00	30.853			1851.20					
	1	3	1	30.86	.20	1	1 851.2	0 1	1 380.9	0.1
	2	3	2	61.71	.21	2	3 702.4	2	2 761.8	0.5
	3	4	3	92.57	.21	3	5 553.6	3	4 142.7	1.2
	4	4	4	123.42	.22	4	7 404.8	4	5 523.5	2.2
42	05	30.854	5	154.28	1851.22	5	9 256.0	0 5	6 904.4	3.4
	6	4	6	185.14	.23	6	11 107.3	6	8 285.3	4.8
	7	4	7	215.99	.23	7	12 958.5	7	9 666.2	6.6
	8	4	8	246.85	.24	8	14 809.7	8	11 047.1	8.6
	9	4	9	277.70	.24	9	16 661.0	9	12 428.0	10.9
42	10	30.854	10	308.56	1851.25	10	18 512.2	0 10	13 808.8	13.4
	11	4	1	339.42	.26	1	20 363.5	15	20 713.2	30.2
	12	4	2	370.27	.26	2	22 214.7	20	27 617.6	53.8
	13	4	3	401.13	.27	3	24 066.0	25	34 522.0	84.0
	14	5	4	431.98	.27	4	25 917.3	30	41 426.3	120.9
42	15	30.855	15	462.84	1851.28	15	27 768.5	0 35	48 330.6	164.6
	16	5	6	493.70	.28	6	29 619.8	40	55 234.8	215.0
	17	5	7	524.55	.29	7	31 471.1	45	62 139.0	272.1
	18	5	8	555.41	.29	8	33 322.4	50	69 043.1	336.0
	19	5	9	586.26	.30	9	35 173.7	55	75 947.2	406.5
42	20	30.855	20	617.12	1851.30	20	37 025.0	1 00	82 851.2	483.8
	21	5	1	647.98	.31	1	38 876.3	05	89 755.1	567.8
	22	5	2	678.83	.32	2	40 727.6	10	96 658.9	658.5
	23	5	3	709.69	.32	3	42 578.9	15	103 562.6	755.9
	24	5	4	740.54	.33	4	44 430.3	20	110 466.3	860.1
42	25	30.856	25	771.40	1851.33	25	46 281.6	1 25	117 369.8	971.0
	26	6	6	802.26	.34	6	48 132.9	30	124 273.2	1 088.5
	27	6	7	833.11	.34	7	49 984.3	35	131 176.5	1 212.8
	28	6	8	863.97	.35	8	51 835.6	40	138 079.7	1 343.8
	29	6	9	894.82	.35	9	53 686.9	45	144 982.7	1 481.6
42	30	30.856	30	925.68	1851.36	30	55 538.3	1 50	151 885.6	1 626.1
	31	6	1	956.54	.37	1	57 389.7	55	158 788.4	1 777.2
	32	6	2	987.39	.37	2	59 241.0	2 00	165 691	1 935
	33	6	3	1 018.25	.38	3	61 092.4	3 00	248 508	4 354
	34	6	4	1 049.10	.38	4	62 943.8	4 00	331 292	7 739
42	35	30.856	35	1 079.96	1851.39	35	64 795.2	5 00	414 030	12 092
	36	7	6	1 110.82	.39	6	66 646.6	6 00	496 712	17 410
	37	7	7	1 141.67	.40	7	68 498.0	7 00	579 325	23 693
	38	7	8	1 172.53	.40	8	70 349.4	8 00	661 861	30 941
	39	7	9	1 203.38	.41	9	72 200.8	9 00	744 305	39 152
42	40	30.857	40	1 234.24	1851.41	40	74 052.2	10 00	826 648	48 325
	41	7	1	1 265.10	.42	1	75 903.6	11 00	908 879	58 459
	42	7	2	1 295.95	.43	2	77 755.0	12 00	990 985	69 553
	43	7	3	1 326.81	.43	3	79 606.4	13 00	1 072 956	81 605
	44	7	4	1 357.66	.44	4	81 457.9	14 00	1 154 781	94 614
42	45	30.857	45	1 388.52	1851.44	45	83 309.3	15 00	1 236 449	108 577
	46	7	6	1 419.38	.45	6	85 160.8	16 00	1 317 948	123 493
	47	8	7	1 450.23	.45	7	87 012.2	17 00	1 399 267	139 360
	48	8	8	1 481.09	.46	8	88 863.7	18 00	1 480 395	156 175
	49	8	9	1 511.94	.46	9	90 715.1	19 00	1 561 321	173 937
42	50	30.858	50	1 542.80	1851.47	50	92 566.6	20 00	1 642 035	192 642
	51	8	1	1 573.66	.47	1	94 418.1	21 00	1 722 524	212 289
	52	8	2	1 604.51	.48	2	96 269.5	22 00	1 802 779	232 874
	53	8	3	1 635.37	.49	3	98 121.0	23 00	1 882 788	254 396
	54	8	4	1 666.22	.49	4	99 972.5	24 00	1 962 540	276 850
42	55	30.858	55	1 697.08	1851.50	55	101 824.0	25 00	2 042 024	300 234
	56	8	6	1 727.94	.50	6	103 675.5	26 00	2 121 230	324 544
	57	8	7	1 758.79	.51	7	105 527.0	27 00	2 200 146	349 778
	58	9	8	1 789.65	.51	8	107 378.5	28 00	2 278 762	375 932
	59	9	9	1 820.50	.52	9	109 230.0	29 00	2 357 067	403 002
42	60	30.859	60	1 851.36	1851.52	60	111 081.6	30 00	2 435 052	430 985

Latitude 43° to 44°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
43 00	22.651	45.30	67.95	90.60	113.25	135.91	158.56	181.21	203.86	1359.1	2718.1	4077.2	5436.2	6795.3
1	.645	.29	.93	.58	.22	.87	.52	.16	.81	8.7	7.4	6.1	4.7	3.4
2	.639	.28	.92	.55	.19	.83	.47	.11	.75	8.3	6.6	5.0	3.3	91.6
3	.632	.26	.90	.53	.16	.79	.43	.06	.69	7.9	5.9	3.8	1.8	89.7
4	.626	.25	.88	.50	.13	.76	.39	1.01	.64	7.6	5.1	2.7	30.3	7.9
43 05	22.620	45.24	67.86	90.48	113.10	135.72	158.34	180.96	203.58	1357.2	2714.4	4071.6	5428.9	6786.1
6	.614	.23	.84	.46	.07	.68	.30	.91	.53	6.8	3.7	70.5	7.4	4.2
7	.608	.22	.82	.43	.04	.65	.26	.86	.47	6.5	3.0	69.4	5.9	2.4
8	.602	.20	.81	.41	3.01	.61	.22	.81	.42	6.1	2.2	8.3	4.4	80.6
9	.596	.19	.79	.38	2.98	.57	.17	.77	.36	5.7	1.5	7.2	3.0	78.7
43 10	22.590	45.18	67.77	90.36	112.95	135.54	158.13	180.72	203.31	1355.4	2710.8	4066.1	5421.5	6776.9
11	.583	.17	.75	.34	.92	.50	.09	.67	.25	5.0	10.1	5.0	20.0	5.0
12	.577	.15	.73	.31	.89	.46	.04	.62	.19	4.6	09.3	3.9	18.5	3.2
13	.571	.14	.71	.29	.86	.43	8.00	.57	.14	4.3	8.6	2.8	7.1	71.3
14	.565	.13	.69	.26	.83	.39	7.96	.52	.09	3.9	7.8	1.7	5.6	69.5
43 15	22.559	45.12	67.68	90.24	112.79	135.35	157.91	180.47	203.03	1353.5	2707.1	4060.6	5414.1	6767.6
16	.553	.11	.66	.21	.76	.32	.87	.42	2.97	3.2	6.3	59.5	2.6	5.8
17	.547	.09	.64	.19	.73	.28	.83	.37	.92	2.8	5.6	8.4	11.2	4.0
18	.540	.08	.62	.16	.70	.24	.79	.32	.86	2.4	4.9	7.3	09.7	2.1
19	.534	.07	.60	.14	.67	.21	.74	.27	.81	2.1	4.1	6.2	8.2	60.3
43 20	22.528	45.06	67.58	90.11	112.64	135.17	157.70	180.22	202.75	1351.7	2703.4	4055.1	5406.7	6758.4
21	.522	.04	.57	.09	.61	.13	.65	.18	.70	1.3	2.7	4.0	5.3	6.6
22	.516	.03	.55	.06	.58	.09	.61	.13	.64	0.9	1.9	2.8	3.8	4.7
23	.510	.02	.53	.04	.55	.06	.57	.08	.59	0.6	1.2	1.7	2.3	2.9
24	.503	5.01	.51	90.01	.52	5.02	.52	80.03	.53	50.2	700.4	50.6	400.8	51.0
43 25	22.497	44.99	67.49	89.99	112.49	134.98	157.48	179.98	202.48	1349.8	2699.7	4049.5	5399.3	6749.2
26	.491	.98	.47	.96	.45	.95	.44	.93	.42	9.5	8.9	8.4	7.8	7.3
27	.485	.97	.45	.94	.42	.91	.39	.88	.37	9.1	8.2	7.3	6.4	5.5
28	.479	.96	.44	.92	.39	.87	.35	.83	.31	8.7	7.5	6.2	4.9	3.6
29	.473	.95	.42	.89	.36	.84	.31	.78	.25	8.4	6.7	5.1	3.4	41.8
43 30	22.466	44.93	67.40	89.87	112.33	134.80	157.26	179.73	202.20	1348.0	2696.0	4043.9	5391.9	6739.9
31	.460	.92	.38	.84	.30	.76	.22	.68	.14	7.6	5.2	2.8	90.4	8.1
32	.454	.91	.36	.82	.27	.72	.18	.63	.09	7.2	4.5	1.7	89.0	6.2
33	.448	.90	.34	.79	.24	.69	.13	.58	2.03	6.9	3.8	40.6	7.5	4.3
34	.442	.88	.32	.77	.21	.65	.09	.53	1.98	6.5	3.0	39.5	6.0	2.5
43 35	22.435	44.87	67.31	89.74	112.18	134.61	157.05	179.48	201.92	1346.1	2692.3	4038.4	5384.5	6730.6
36	.429	.86	.29	.72	.14	.58	7.01	.43	.86	5.8	1.5	7.3	3.0	28.8
37	.423	.85	.27	.69	.11	.54	6.96	.38	.81	5.4	0.8	6.1	1.5	6.9
38	.417	.83	.25	.67	.08	.50	.92	.34	.75	5.0	90.0	5.0	80.0	5.1
39	.411	.82	.23	.64	.05	.46	.87	.29	.70	4.6	89.3	3.9	78.6	3.2
43 40	22.404	44.81	67.21	89.62	112.02	134.43	156.83	179.24	201.64	1344.3	2688.5	4032.8	5377.1	6721.3
41	.398	.80	.19	.59	1.99	.39	.79	.19	.58	3.9	7.8	1.7	5.6	19.5
42	.392	.78	.18	.57	.96	.35	.74	.14	.53	3.5	7.0	30.6	4.1	7.6
43	.386	.77	.16	.54	.93	.32	.70	.09	.47	3.2	6.3	29.5	2.6	5.8
44	.380	.76	.14	.52	.90	.28	.66	9.04	.42	2.8	5.5	8.3	71.1	3.9
43 45	22.373	44.75	67.12	89.49	111.87	134.24	156.61	178.99	201.36	1342.4	2684.8	4027.2	5369.6	6712.0
46	.367	.73	.10	.47	.83	.20	.57	.94	.30	2.0	4.1	6.1	8.1	10.2
47	.361	.72	.08	.44	.80	.17	.53	.89	.25	1.7	3.3	5.0	6.6	08.3
48	.355	.71	.06	.42	.77	.13	.49	.84	.19	1.3	2.6	3.9	5.2	6.4
49	.349	.70	.05	.39	.74	.09	.44	.79	.14	0.9	1.8	2.7	3.7	4.6
43 50	22.342	44.68	67.03	89.37	111.71	134.05	156.40	178.74	201.08	1340.5	2681.1	4021.6	5362.2	6702.7
51	.336	.67	7.01	.35	.68	4.02	.36	.69	1.03	40.2	80.3	20.5	60.7	700.9
52	.330	.66	6.99	.32	.65	3.98	.31	.64	0.97	39.8	79.6	19.4	59.2	6699.0
53	.324	.65	.97	.29	.62	.94	.27	.59	.91	9.4	8.9	8.3	7.7	7.1
54	.318	.64	.95	.27	.59	.91	.22	.54	.86	9.1	8.1	7.2	6.2	5.3
43 55	22.311	44.62	66.93	89.25	111.56	133.87	156.18	178.49	200.80	1338.7	2677.4	4016.0	5354.7	6693.4
56	.305	.61	.92	.22	.52	.83	.14	.44	.74	8.3	6.6	4.9	3.2	91.5
57	.299	.60	.90	.20	.49	.79	.09	.39	.69	7.9	5.9	3.8	1.7	89.6
58	.293	.59	.88	.17	.46	.76	.05	.34	.63	7.6	5.1	2.7	50.2	7.8
59	.286	.57	.86	.15	.43	.72	6.00	.29	.58	7.2	4.4	1.5	48.7	5.9
43 60	22.280	44.56	66.84	89.12	111.40	133.68	155.96	178.24	200.52	1336.8	2673.6	4010.4	5347.2	6684.0

Lat.		Latitude 43° to 44°—Meridional arcs.						Latitude 43°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 43° 30′		Value of 1′	Continuous sums of minutes from latitude 43° 00′		Longitude.	X	Y
°	′	Meters.	″	Meters.	Meters.	′	Meters.	° ′	Meters.	Meters.
43	00	30.859			1851.52					
	1	9	1	30.86	.53	1	1 851.5	0 1	1 359.1	0.1
	2	9	2	61.72	.53	2	3 703.1	2	2 718.1	0.5
	3	9	3	92.58	.54	3	5 554.6	3	4 077.2	1.2
	4	9	4	123.45	.55	4	7 406.1	4	5 436.2	2.2
43	05	30.859	5	154.31	1851.55	5	9 257.7	0 5	6 795.3	3.4
	6	9	6	185.17	.56	6	11 109.2	6	8 154.3	4.9
	7	9	7	216.03	.56	7	12 960.8	7	9 513.4	6.6
	8	59	8	246.89	.57	8	14 812.4	8	10 872.4	8.6
	9	60	9	277.75	.57	9	16 663.9	9	12 231.5	10.9
43	10	30.860	10	308.61	1851.58	10	18 515.5	0 10	13 590.5	13.5
	11	0	1	339.48	.58	1	20 367.1	15	20 385.8	30.3
	12	0	2	370.34	.59	2	22 218.7	20	27 181.0	53.9
	13	0	3	401.20	.59	3	24 070.3	25	33 976.2	84.3
	14	0	4	432.06	.60	4	25 921.9	30	40 771.4	121.3
43	15	30.860	15	462.92	1851.61	15	27 773.5	0 35	47 566.5	165.1
	16	0	6	493.78	.61	6	29 625.1	40	54 361.6	215.7
	17	0	7	524.64	.62	7	31 476.7	45	61 156.7	273.0
	18	0	8	555.51	.62	8	33 328.3	50	67 951.6	337.0
	19	0	9	586.37	.63	9	35 179.9	55	74 746.5	407.8
43	20	30.861	20	617.23	1851.63	20	37 031.6	1 00	81 541.3	485.3
	21	1	1	648.09	.64	1	38 883.2	05	88 336.1	569.6
	22	1	2	678.95	.64	2	40 734.8	10	95 130.7	660.5
	23	1	3	709.81	.65	3	42 586.5	15	101 925.3	758.3
	24	1	4	740.68	.65	4	44 438.1	20	108 719.8	862.8
43	25	30.861	25	771.54	1851.66	25	46 289.8	1 25	115 514.2	974.0
	26	1	6	802.40	.67	6	48 141.4	30	122 308.4	1 091.9
	27	1	7	833.26	.67	7	49 993.1	35	129 102.5	1 216.6
	28	1	8	864.12	.68	8	51 844.8	40	135 896.5	1 348.0
	29	1	9	894.98	.68	9	53 696.5	45	142 690.4	1 486.2
43	30	30.861	30	925.84	1851.69	30	55 548.2	1 50	149 484.1	1 631.1
	31	2	1	956.71	.69	1	57 399.9	55	156 277.7	1 782.8
	32	2	2	987.57	.70	2	59 251.6	2 00	163 071	1 941
	33	2	3	1 018.43	.70	3	61 103.3	3 00	244 578	4 367
	34	2	4	1 049.29	.71	4	62 955.0	4 00	326 050	7 763
43	35	30.862	35	1 080.15	1851.72	35	64 806.7	5 00	407 476	12 129
	36	2	6	1 111.01	.72	6	66 658.4	6 00	488 844	17 464
	37	2	7	1 141.87	.73	7	68 510.1	7 00	570 148	23 766
	38	2	8	1 172.74	.73	8	70 361.9	8 00	651 361	31 036
	39	2	9	1 203.60	.74	9	72 213.6	9 00	732 486	39 272
43	40	30.862	40	1 234.46	1851.74	40	74 065.3	10 00	813 508	48 474
	41	2	1	1 265.32	.75	1	75 917.1	11 00	894 415	58 639
	42	3	2	1 296.18	.75	2	77 768.8	12 00	975 195	69 766
	43	3	3	1 327.04	.76	3	79 620.5	13 00	1 055 837	81 854
	44	3	4	1 357.90	.76	4	81 472.3	14 00	1 136 329	94 901
43	45	30.863	45	1 388.77	1851.77	45	83 324.1	15 00	1 216 661	108 905
	46	3	6	1 419.63	.78	6	85 175.8	16 00	1 296 820	123 864
	47	3	7	1 450.49	.78	7	87 027.6	17 00	1 376 795	139 777
	48	3	8	1 481.35	.79	8	88 879.4	18 00	1 456 575	156 640
	49	3	9	1 512.21	.79	9	90 731.2	19 00	1 536 148	174 451
43	50	30.863	50	1 543.07	1851.80	50	92 583.0	20 00	1 615 505	193 209
	51	3	1	1 573.93	.80	1	94 434.8	21 00	1 694 632	212 909
	52	3	2	1 604.80	.81	2	96 286.6	22 00	1 773 519	233 551
	53	4	3	1 635.66	.81	3	98 138.4	23 00	1 852 155	255 129
	54	4	4	1 666.52	.82	4	99 990.3	24 00	1 930 528	277 642
43	55	30.864	55	1 697.38	1851.82	55	101 842.1	25 00	2 008 628	301 087
	56	4	6	1 728.24	.83	6	103 693.9	26 00	2 086 443	325 459
	57	4	7	1 759.10	.84	7	105 545.7	27 00	2 163 963	350 756
	58	4	8	1 789.96	.84	8	107 397.6	28 00	2 241 176	376 974
	59	4	9	1 820.83	.85	9	109 249.4	29 00	2 318 071	404 109
43	60	30.864	60	1 851.69	1851.85	60	111 101.3	30 00	2 394 639	432 157

Latitude 44° to 45°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
44 00	22.280	44.56	66.84	89.12	111.40	133.68	155.96	178.24	200.52	1336.8	2673.6	4010.4	5347.2	6684.0
1	.274	.55	.82	.10	.37	.64	.92	.19	.46	6.4	2.9	09.3	5.7	2.2
2	.268	.54	.80	.07	.34	.61	.87	.14	.41	6.1	2.1	8.2	4.2	80.3
3	.261	.52	.78	.05	.31	.57	.83	.09	.35	5.7	1.4	7.0	2.7	78.4
4	.255	.51	.76	.02	.28	.53	.78	8.04	.30	5.3	70.6	5.9	41.2	6.5
44 05	22.249	44.50	66.75	89.00	111.24	133.49	155.74	177.99	200.24	1334.9	2669.9	4004.8	5339.7	6674.7
6	.243	.49	.73	8.97	.21	.46	.70	.94	.18	4.6	9.1	3.7	8.2	2.8
7	.236	.47	.71	.95	.18	.42	.65	.89	.13	4.2	8.4	2.6	6.7	70.9
8	.230	.46	.69	.92	.15	.38	.61	.84	.07	3.8	7.6	1.4	5.2	69.0
9	.224	.45	.67	.90	.13	.34	.57	.79	200.02	3.4	6.9	4000.3	3.7	7.2
44 10	22.218	44.44	66.65	88.87	111.09	133.31	155.52	177.74	199.96	1333.1	2666.1	3999.2	5332.2	6665.3
11	.211	.42	.63	.85	.06	.27	.48	.69	.90	2.7	5.4	8.1	30.7	3.4
12	.205	.41	.61	.82	.03	.23	.43	.64	.85	2.3	4.6	6.9	29.2	61.5
13	.199	.40	.60	.80	1.00	.19	.39	.59	.79	1.9	3.9	5.8	7.7	59.7
14	.193	.39	.58	.77	0.97	.16	.35	.54	.74	1.6	3.1	4.7	6.2	7.8
44 15	22.186	44.37	66.56	88.75	110.93	133.12	155.30	177.49	199.68	1331.2	2662.4	3993.5	5324.7	6655.9
16	.180	.36	.54	.72	.90	.08	.26	.44	.62	0.8	1.6	2.4	3.2	4.0
17	.174	.35	.52	.70	.87	.04	.22	.39	.57	0.4	0.9	1.3	1.7	2.1
18	.168	.34	.50	.67	.84	3.01	.18	.34	.51	30.1	60.1	90.2	20.2	50.3
19	.161	.32	.48	.65	.81	2.97	.13	.29	.45	29.7	59.4	89.0	18.7	48.4
44 20	22.155	44.31	66.47	88.62	110.78	132.93	155.09	177.24	199.40	1329.3	2658.6	3987.9	5317.2	6646.5
21	.149	.30	.45	.59	.74	.89	.04	.19	.34	8.9	7.8	6.8	5.7	4.6
22	.142	.28	.43	.57	.71	.85	5.00	.14	.28	8.5	7.1	5.6	4.2	2.7
23	.136	.27	.41	.54	.68	.82	4.96	.09	.23	8.2	6.3	4.5	2.7	40.8
24	.130	.26	.39	.52	.65	.78	.91	7.04	.17	7.8	5.6	3.4	11.2	39.0
44 25	22.124	44.25	66.37	88.49	110.62	132.74	154.87	176.99	199.11	1327.4	2654.8	3982.2	5309.7	6637.1
26	.117	.23	.35	.47	.59	.70	.82	.94	.06	7.0	4.1	1.1	8.2	5.2
27	.111	.22	.33	.44	.55	.67	.77	.89	9.00	6.7	3.3	80.0	6.6	3.3
28	.105	.21	.31	.42	.52	.63	.74	.84	8.94	6.3	2.6	78.9	5.1	31.4
29	.098	.20	.30	.39	.49	.59	.69	.79	.89	5.9	1.8	7.7	3.6	29.5
44 30	22.092	44.18	66.28	88.37	110.46	132.55	154.65	176.74	198.83	1325.5	2651.1	3976.6	5302.1	6627.7
31	.086	.17	.26	.34	.42	.52	.61	.69	.77	5.2	50.3	5.5	300.6	5.8
32	.080	.16	.24	.32	.40	.48	.56	.64	.72	4.8	49.6	4.3	299.1	3.9
33	.073	.15	.22	.29	.37	.44	.52	.59	.66	4.4	8.8	3.2	7.6	2.0
34	.067	.13	.20	.27	.34	.40	.47	.54	.60	4.0	8.1	2.0	6.1	20.1
44 35	22.061	44.12	66.18	88.24	110.30	132.36	154.43	176.49	198.55	1323.6	2647.3	3970.9	5294.6	6618.2
36	.054	.11	.16	.22	.27	.33	.38	.43	.49	3.3	6.5	69.8	3.0	6.3
37	.048	.10	.14	.19	.24	.29	.34	.38	.43	2.9	5.8	8.6	1.5	4.4
38	.042	.08	.13	.17	.21	.25	.29	.33	.37	2.5	5.0	7.5	90.0	2.5
39	.035	.07	.11	.14	.18	.21	.25	.28	.32	2.1	4.3	6.4	88.5	10.6
44 40	22.029	44.06	66.09	88.12	110.15	132.17	154.20	176.23	198.26	1321.7	2643.5	3965.2	5287.0	6608.7
41	.023	.04	.07	.09	.12	.14	.16	.18	.20	1.4	2.7	4.1	5.5	6.8
42	.016	.03	.05	.07	.09	.10	.11	.13	.15	1.0	2.0	3.0	4.0	4.9
43	.010	.02	.05	.04	.05	.06	.07	.08	.09	0.6	1.2	1.8	2.4	3.1
44	.004	.01	6.01	8.02	10.02	2.02	4.02	6.03	8.03	20.2	40.5	60.7	80.9	601.2
44 45	21.998	44.00	65.99	87.99	109.99	131.99	153.98	175.98	197.98	1319.9	2639.7	3959.6	5279.4	6599.3
46	.991	3.98	.97	.96	.96	.95	.94	.93	.92	9.5	8.9	8.4	7.9	7.4
47	.985	.97	.96	.94	.93	.91	.89	.88	.86	9.1	8.2	7.3	6.4	5.5
48	.979	.96	.94	.91	.89	.87	.85	.83	.80	8.7	7.4	6.1	4.9	3.6
49	.972	.95	.92	.89	.86	.83	.80	.78	.75	8.3	6.7	5.0	3.3	91.7
44 50	21.966	43.93	65.90	87.86	109.83	131.80	153.76	175.73	197.69	1318.0	2635.9	3953.9	5271.8	6589.8
51	.960	.92	.88	.84	.80	.76	.72	.68	.63	7.6	5.1	2.7	70.3	7.9
52	.953	.91	.86	.81	.77	.72	.67	.63	.58	7.2	4.4	1.6	68.8	6.0
53	.947	.89	.84	.79	.73	.68	.63	.58	.52	6.8	3.6	50.4	7.3	4.1
54	.941	.88	.82	.76	.70	.64	.58	.52	.46	6.4	2.9	49.3	5.7	2.2
44 55	21.934	43.87	65.80	87.74	109.67	131.61	153.54	175.47	197.41	1316.1	2632.1	3948.2	5264.2	6580.3
56	.928	.86	.78	.71	.64	.57	.50	.42	.35	5.7	1.3	7.0	2.7	78.4
57	.922	.84	.77	.69	.61	.53	.45	.37	.29	5.3	30.6	5.9	61.2	6.5
58	.915	.83	.75	.66	.57	.49	.41	.32	.23	4.9	29.8	4.7	59.6	4.6
59	.909	.82	.73	.64	.54	.45	.36	.27	.18	4.5	9.1	3.6	8.1	2.7
44 60	21.903	43.81	65.71	87.61	109.51	131.42	153.32	175.22	197.12	1314.2	2628.3	3942.5	5256.6	6570.8

Lat.		Latitude 44° to 45°—Meridional arcs.						Latitude 44°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 44° 30′		Value of 1′	Continuous sums of minutes from latitude 44° 00′		Longitude.	X	Y
°	′	Meters.	″	Meters.	Meters.	′	Meters.	° ′	Meters.	Meters.
44	00	30.864			1851.85					
	1	4	1	30.87	.86	1	1 851.9	0 1	1 336.8	0.1
	2	4	2	61.73	.86	2	3 703.7	2	2 673.6	0.5
	3	4	3	92.60	.87	3	5 555.6	3	4 010.4	1.2
	4	5	4	123.47	.87	4	7 407.4	4	5 347.2	2.2
44	05	30.865	5	154.33	1851.88	5	9 259.3	0 5	6 684.0	3.4
	6	5	6	185.20	.89	6	11 111.2	6	8 020.8	4.9
	7	5	7	216.07	.89	7	12 963.1	7	9 357.7	6.6
	8	5	8	246.94	.90	8	14 815.0	8	10 694.5	8.6
	9	5	9	277.80	.90	9	16 666.9	9	12 031.3	10.9
44	10	30.865	10	308.67	1851.91	10	18 518.8	0 10	13 368.1	13.5
	11	5	1	339.54	.91	1	20 370.7	15	20 052.1	30.4
	12	5	2	370.40	.92	2	22 222.6	20	26 736.1	54.0
	13	5	3	401.27	.92	3	24 074.5	25	33 420.1	84.4
	14	5	4	432.14	.93	4	25 926.5	30	40 104.0	121.5
44	15	30.866	15	463.00	1851.93	15	27 778.4	0 35	46 787.9	165.4
	16	6	6	493.87	.94	6	29 630.3	40	53 471.8	216.1
	17	6	7	524.74	.95	7	31 482.3	45	60 155.6	273.5
	18	6	8	555.61	.95	8	33 334.2	50	66 839.3	337.7
	19	6	9	586.47	.96	9	35 186.2	55	73 523.0	408.6
44	20	30.866	20	617.34	1851.96	20	37 038.1	1 00	80 206.5	486.2
	21	6	1	648.21	.97	1	38 890.1	05	86 890.0	570.6
	22	6	2	679.07	.97	2	40 742.0	10	93 573.5	661.8
	23	6	3	709.94	.98	3	42 594.0	15	100 256.8	759.7
	24	6	4	740.81	.98	4	44 446.0	20	106 940.0	864.4
44	25	30.866	25	771.67	1851.99	25	46 298.0	1 25	113 623.1	975.8
	26	7	6	802.54	1.99	6	48 150.0	30	120 306.1	1 094.0
	27	7	7	833.41	2.00	7	50 002.0	35	126 989.0	1 218.9
	28	7	8	864.27	.01	8	51 854.0	40	133 671.8	1 350.6
	29	7	9	895.14	.01	9	53 706.0	45	140 354.4	1 489.0
44	30	30.867	30	926.01	1852.02	30	55 558.0	1 50	147 036.8	1 634.2
	31	7	1	956.88	.02	1	57 410.0	55	153 719.1	1 786.1
	32	7	2	987.74	.03	2	59 262.0	2 00	160 401	1 945
	33	7	3	1 018.61	.03	3	61 114.1	3 00	240 572	4 375
	34	7	4	1 049.48	.04	4	62 966.1	4 00	320 708	7 778
44	35	30.867	35	1 080.34	1852.04	35	64 818.1	5 00	400 797	12 152
	36	7	6	1 111.21	.05	6	66 670.2	6 00	480 827	17 496
	37	8	7	1 142.08	.06	7	68 522.2	7 00	560 786	23 811
	38	8	8	1 172.94	.06	8	70 374.3	8 00	640 662	31 094
	39	8	9	1 203.81	.07	9	72 226.4	9 00	720 445	39.345
44	40	30.868	40	1 234.68	1852.07	40	74 078.4	10 00	800 122	48 563
	41	8	1	1 265.54	.08	1	75 930.5	11 00	879 681	58 746
	42	8	2	1 296.41	.08	2	77 782.6	12 00	959 110	69 893
	43	8	3	1 327.28	.09	3	79 634.7	13 00	1 038 399	82 002
	44	8	4	1 358.15	.09	4	81 486.8	14 00	1 117 535	95 072
44	45	30.868	45	1 389.01	1852.10	45	83 338.9	15 00	1 196 507	109 100
	46	8	6	1 419.88	.10	6	85 191.0	16 00	1 275 303	124 084
	47	9	7	1 450.75	.11	7	87 043.1	17 00	1 353 911	140 023
	48	9	8	1 481.61	.12	8	88 895.2	18 00	1 432 320	156 913
	49	9	9	1 512.48	.12	9	90 747.3	19 00	1 510 519	174 753
44	50	30.869	50	1 543.35	1852.13	50	92 599.5	20 00	1 588 496	193 540
	51	9	1	1 574.21	.13	1	94 451.6	21 00	1 666 240	213 270
	52	9	2	1 605.08	.14	2	96 303.7	22 00	1 743 738	233 942
	53	9	3	1 635.95	.14	3	98 155.9	23 00	1 820 980	255 552
	54	9	4	1 666.82	.15	4	100 008.0	24 00	1 897 955	278 096
44	55	30.869	55	1 697.68	1852.15	55	101 860.2	25 00	1 974 650	301 572
	56	9	6	1 728.55	.16	6	103 712.3	26 00	2 051 055	325 977
	57	69	7	1 759.42	.16	7	105 564.5	27 00	2 127 159	351 306
	58	70	8	1 790.28	.17	8	107 416.7	28 00	2 202 950	377 555
	59	0	9	1 821.15	.18	9	109 268.8	29 00	2 278 417	404 722
44	60	30.870	60	1 852.02	1852.18	60	111 121.0	30 00	2 353 550	432 801

Latitude 45° to 46°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
45 00	21.903	43.81	65.71	87.61	109.51	131.42	153.32	175.22	197.12	1314.2	2628.3	3942.5	5256.6	6570.8
1	.896	.79	.69	.58	.48	.38	.28	.17	.06	3.8	7.5	1.3	5.1	68.8
2	.890	.78	.67	.56	.45	.34	.23	.12	7.01	3.4	6.8	40.2	3.6	6.9
3	.883	.77	.65	.53	.42	.30	.19	.07	6.95	3.0	6.0	39.0	2.0	5.0
4	.877	.75	.63	.51	.39	.26	.14	5.02	.89	2.6	5.3	7.9	50.5	3.1
45 05	21.871	43.74	65.61	87.48	109.35	131.22	153.10	174.97	196.83	1312.2	2624.5	3936.7	5249.0	6561.2
6	.864	.73	.59	.46	.32	.19	.05	.91	.78	1.9	3.7	5.6	7.4	59.3
7	.858	.72	.57	.43	.29	.15	3.01	.86	.72	1.5	3.0	4.4	5.9	7.4
8	.852	.70	.56	.41	.26	.11	2.96	.81	.66	1.1	2.2	3.3	4.4	5.5
9	.845	.69	.54	.38	.23	.07	.92	.76	.61	0.7	1.5	2.2	2.9	3.6
45 10	21.839	43.68	65.52	87.36	109.20	131.03	152.87	174.71	196.55	1310.3	2620.7	3931.0	5241.3	6551.7
11	.833	.67	.50	.33	.17	1.00	.83	.66	.49	10.0	19.9	29.9	39.8	49.8
12	.826	.65	.48	.30	.13	0.96	.78	.61	.44	9.6	9.1	8.7	8.3	7.9
13	.820	.64	.46	.28	.10	.92	.74	.56	.38	9.2	8.4	7.6	6.8	5.9
14	.813	.63	.44	.25	.07	.88	.69	.51	.32	8.8	7.6	6.4	5.2	4.0
45 15	21.807	43.61	65.42	87.23	109.04	130.84	152.65	174.46	196.26	1308.4	2616.8	3925.3	5233.7	6542.1
16	.801	.60	.40	.20	9.01	.80	.61	.41	.21	8.0	6.1	4.1	2.2	40.2
17	.794	.59	.38	.18	8.98	.77	.56	.35	.15	7.7	5.3	3.0	30.6	38.3
18	.788	.58	.36	.15	.94	.73	.52	.30	.09	7.3	4.5	1.8	29.1	6.4
19	.782	.56	.35	.13	.91	.69	.47	.25	6.04	6.9	3.8	20.7	7.6	4.5
45 20	21.775	43.55	65.33	87.10	108.88	130.65	152.43	174.20	195.98	1306.5	2613.0	3919.5	5226.0	6532.5
21	.769	.54	.31	.07	.85	.61	.39	.15	.92	6.1	2.2	8.4	4.5	30.6
22	.762	.52	.29	.05	.82	.57	.34	.10	.86	5.7	1.5	7.2	3.0	28.7
23	.756	.51	.27	.02	.78	.54	.30	.05	.81	5.4	0.7	6.1	21.4	6.8
24	.750	.50	.25	7.00	.75	.50	.25	4.00	.75	5.0	10.0	4.9	19.9	4.9
45 25	21.743	43.49	65.23	86.97	108.72	130.46	152.21	173.95	195.69	1304.6	2609.2	3913.8	5218.4	6523.0
26	.737	.47	.21	.95	.69	.42	.16	.89	.63	4.2	8.4	2.6	6.8	21.0
27	.730	.46	.19	.92	.66	.38	.12	.84	.57	3.8	7.6	1.5	5.3	19.1
28	.724	.45	.17	.90	.62	.34	.07	.79	.52	3.4	6.9	10.3	3.8	7.2
29	.718	.44	.15	.87	.59	.31	2.03	.74	.46	3.1	6.1	09.2	2.2	5.3
45 30	21.711	43.42	65.13	86.84	108.56	130.27	151.98	173.69	195.40	1302.7	2605.3	3908.0	5210.7	6513.4
31	.705	.41	.11	.82	.53	.23	.94	.64	.34	2.3	4.5	6.9	09.1	11.4
32	.698	.40	.09	.79	.50	.19	.89	.59	.28	1.9	3.8	5.7	7.6	09.5
33	.692	.38	.08	.77	.46	.15	.85	.54	.23	1.5	3.0	4.6	6.1	7.6
34	.686	.37	.06	.74	.43	.11	.80	.48	.17	1.1	2.3	3.4	4.5	5.7
45 35	21.679	43.36	65.04	86.72	108.40	130.07	151.76	173.43	195.11	1300.7	2601.5	3902.2	5203.0	6503.7
36	.673	.35	.02	.69	.37	.04	.71	.38	5.05	0.4	600.7	901.1	201.4	501.8
37	.666	.33	5.00	.66	.34	30.00	.67	.33	4.99	300.0	599.9	899.9	199.9	499.9
38	.660	.32	4.98	.64	.30	29.96	.62	.28	.94	299.6	9.2	8.8	8.4	8.0
39	.653	.31	.96	.61	.27	.92	.58	.23	.88	9.2	8.4	7.6	6.8	6.0
45 40	21.647	43.29	64.94	86.59	108.24	129.88	151.53	173.18	194.82	1298.8	2597.6	3896.5	5195.3	6494.1
41	.641	.28	.92	.56	.20	.84	.48	.12	.76	8.4	6.8	5.3	3.7	2.2
42	.634	.27	.90	.54	.17	.81	.44	.07	.71	8.1	6.1	4.2	2.2	90.3
43	.628	.26	.88	.51	.14	.77	.40	3.02	.65	7.7	5.3	3.0	90.7	88.3
44	.621	.24	.86	.49	.11	.73	.35	2.97	.59	7.3	4.6	1.8	89.1	6.4
45 45	21.615	43.23	64.85	86.46	108.07	129.69	151.31	172.92	194.54	1296.9	2593.8	3890.7	5187.6	6484.5
46	.608	.22	.83	.43	.04	.65	.26	.87	.48	6.5	3.0	89.5	6.0	2.5
47	.602	.20	.81	.41	8.01	.61	.22	.82	.42	6.1	2.2	8.4	4.5	80.6
48	.596	.19	.79	.38	7.98	.57	.17	.76	.36	5.7	1.5	7.2	2.9	78.7
49	.589	.18	.77	.36	.94	.53	.13	.71	.30	5.3	90.7	6.0	81.4	6.7
45 50	21.583	43.17	64.75	86.33	107.91	129.50	151.08	172.66	194.25	1295.0	2589.9	3884.9	5179.9	6474.8
51	.576	.15	.73	.30	.88	.46	1.04	.61	.19	4.6	9.1	3.7	8.3	2.9
52	.570	.14	.71	.28	.85	.42	0.99	.56	.13	4.2	8.4	2.6	6.8	70.9
53	.563	.13	.69	.25	.81	.38	.95	.51	.07	3.8	7.6	1.4	5.2	69.0
54	.557	.11	.67	.23	.78	.34	.90	.46	4.01	3.4	6.9	80.2	3.7	7.1
45 55	21.550	43.10	64.65	86.20	107.75	129.30	150.86	172.40	193.96	1293.0	2586.1	3879.1	5172.1	6465.1
56	.544	.09	.63	.18	.72	.26	.81	.35	.90	2.6	5.3	7.9	70.6	3.2
57	.538	.08	.61	.15	.69	.23	.77	.30	.84	2.3	4.5	6.8	69.0	61.3
58	.531	.06	.59	.13	.65	.19	.72	.25	.78	1.9	3.8	5.6	7.5	59.3
59	.525	.05	.57	.10	.62	.15	.68	.20	.72	1.5	3.0	4.4	5.9	7.4
45 60	21.518	43.04	64.55	86.07	107.59	129.11	150.63	172.15	193.66	1291.1	2582.2	3873.3	5164.4	6455.5

Lat.		Latitude 45° to 46°—Meridional arcs.						Latitude 45°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 45° 30′		Value of 1′	Continuous sums of minutes from latitude 45° 00′		Longitude.	X	Y
°	′	Meters.	″	Meters.	Meters.	′	Meters.	° ′	Meters.	Meters.
45	00	30.870			1852.18					
	1	0	1	30.87	.19	1	1 852.2	0 1	1 314.1	0.1
	2	0	2	61.74	.19	2	3 704.4	2	2 628.3	0.5
	3	0	3	92.62	.20	3	5 556.6	3	3 942.5	1.2
	4	0	4	123.49	.20	4	7 408.8	4	5 256.6	2.2
45	05	30.870	5	154.36	1852.21	5	9 261.0	0 5	6 570.8	3.4
	6	0	6	185.23	.21	6	11 113.2	6	7 884.9	4.9
	7	0	7	216.11	.22	7	12 965.4	7	9 199.1	6.6
	8	0	8	246.98	.23	8	14 817.6	8	10 513.2	8.6
	9	1	9	277.85	.23	9	16 669.9	9	11 827.4	10.9
45	10	30.871	10	308.72	1852.24	10	18 522.1	0 10	13 141.5	13.5
	11	1	1	339.60	.24	1	20 374.3	15	19 712.3	30.4
	12	1	2	370.47	.25	2	22 226.6	20	26 283.0	54.1
	13	1	3	401.34	.25	3	24 078.8	25	32 853.7	84.5
	14	1	4	432.21	.26	4	25 931.1	30	39 424.3	121.6
45	15	30.871	15	463.09	1852.26	15	27 783.3	0 35	45 994.9	165.6
	16	1	6	493.96	.27	6	29 635.6	40	52 565.5	216.2
	17	1	7	524.83	.27	7	31 487.9	45	59 136.0	273.7
	18	1	8	555.70	.28	8	33 340.1	50	65 706.5	337.9
	19	1	9	586.58	.29	9	35 192.4	55	72 276.8	408.8
45	20	30.872	20	617.45	1852.29	20	37 044.7	1 00	78 847.1	486.5
	21	2	1	648.32	.30	1	38 897.0	05	85 417.4	571.0
	22	2	2	679.19	.30	2	40 749.3	10	91 987.5	662.2
	23	2	3	710.07	.31	3	42 601.6	15	98 557.5	760.2
	24	2	4	740.94	.31	4	44 453.9	20	105 127.4	865.0
45	25	30.872	25	771.81	1852.32	25	46 306.2	1 25	111 697.3	976.5
	26	2	6	802.68	.32	6	48 158.6	30	118 267.0	1 094.7
	27	2	7	833.56	.33	7	50 010.9	35	124 836.6	1 219.7
	28	2	8	864.43	.34	8	51 863.2	40	131 406.0	1 351.5
	29	2	9	895.30	.34	9	53 715.6	45	137 975.3	1 490.0
45	30	30.872	30	926.17	1852.35	30	55 567.9	1 50	144 544.4	1 635.3
	31	3	1	957.05	.35	1	57 420.3	55	151 113.5	1 787.3
	32	3	2	987.92	.36	2	59 272.6	2 00	157 682	1 946
	33	3	3	1 018.79	.36	3	61 125.0	3 00	236 493	4 378
	34	3	4	1 049.66	.37	4	62 977.3	4 00	315 269	7 783
45	35	30.873	35	1 080.54	1852.37	35	64 829.7	5 00	393 996	12 160
	36	3	6	1 111.41	.38	6	66 682.1	6 00	472 663	17 508
	37	3	7	1 142.28	.38	7	68 534.5	7 00	551 258	23 826
	38	3	8	1 173.15	.39	8	70 386.9	8 00	629 769	31 114
	39	3	9	1 204.02	.40	9	72 239.3	9 00	708 184	39 370
45	40	30.873	40	1 234.90	1852.40	40	74 091.7	10 00	786 492	48 594
	41	3	1	1 265.77	.41	1	75 944.1	11 00	864 679	58 782
	42	4	2	1 296.64	.41	2	77 796.5	12 00	942 735	69 936
	43	4	3	1 327.51	.42	3	79 648.9	13 00	1 020 647	82 051
	44	4	4	1 358.39	.42	4	81 501.3	14 00	1 098 404	95 127
45	45	30.874	45	1 389.26	1852.43	45	83 353.7	15 00	1 175 994	109 162
	46	4	6	1 420.13	.43	6	85 206.1	16 00	1 253 404	124 153
	47	4	7	1 451.00	.44	7	87 058.6	17 00	1 330 624	140 099
	48	4	8	1 481.88	.44	8	88 911.0	18 00	1 407 640	156 996
	49	4	9	1 512.75	.45	9	90 763.5	19 00	1 484 443	174 842
45	50	30.874	50	1 543.62	1852.46	50	92 615.9	20 00	1 561 019	193 635
	51	4	1	1 574.49	.46	1	94 468.4	21 00	1 637 358	213 371
	52	4	2	1 605.37	.47	2	96 320.9	22 00	1 713 447	234 048
	53	5	3	1 636.24	.47	3	98 173.3	23 00	1 789 276	255 663
	54	5	4	1 667.11	.48	4	100 025.8	24 00	1 864 831	278 211
45	55	30.875	55	1 697.98	1852.48	55	101 878.3	25 00	1 940 103	301 690
	56	5	6	1 728.86	.49	6	103 730.8	26 00	2 015 079	326 097
	57	5	7	1 759.73	.49	7	105 583.3	27 00	2 089 749	351 427
	58	5	8	1 790.60	.50	8	107 435.8	28 00	2 164 100	377 676
	59	5	9	1 821.47	.51	9	109 288.3	29 00	2 238 121	404 841
45	60	30.875	60	1 852.35	1852.51	60	111 140.8	30 00	2 311 802	432 918

Latitude 46° to 47°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
46 00	21.518	43.04	64.55	86.07	107.59	129.11	150.63	172.15	193.66	1291.1	2582.2	3873.3	5164.4	6455.5
1	.512	.02	.53	.05	.56	.07	.58	.09	.60	0.7	1.4	2.1	2.8	3.5
2	.505	.01	.52	6.02	.53	9.03	.54	2.04	.55	90.3	80.6	70.9	61.3	51.6
3	.499	3.00	.50	5.99	.49	8.99	.49	1.99	.49	89.9	79.9	69.8	59.7	49.6
4	.492	2.98	.48	.97	.46	.95	.45	.94	.43	9.5	9.1	8.6	8.2	7.7
46 05	21.486	42.97	64.46	85.94	107.43	128.92	150.40	171.89	193.37	1289.2	2578.3	3867.5	5156.6	6445.8
6	.479	.96	.44	.92	.40	.88	.35	.84	.31	8.8	7.5	6.3	5.1	3.8
7	.473	.95	.42	.89	.37	.84	.31	.78	.25	8.4	6.7	5.1	3.5	41.9
8	.466	.93	.40	.87	.33	.80	.26	.73	.20	8.0	6.0	4.0	1.9	39.9
9	.460	.92	.38	.84	.30	.76	.22	.68	.14	7.6	5.2	2.8	50.4	8.0
46 10	21.454	42.91	64.36	85.81	107.27	128.72	150.17	171.63	193.08	1287.2	2574.4	3861.6	5148.8	6436.1
11	.447	.89	.34	.79	.24	.68	.13	.58	3.02	6.8	3.6	60.5	7.3	4.1
12	.441	.88	.32	.76	.20	.64	.08	.52	2.96	6.4	2.8	59.3	5.7	2.2
13	.434	.87	.30	.74	.17	.60	50.04	.47	.91	6.0	2.1	8.1	4.2	30.2
14	.428	.86	.28	.71	.14	.57	49.99	.42	.85	5.7	1.3	7.0	2.6	28.3
46 15	21.421	42.84	64.26	85.68	107.10	128.53	149.95	171.37	192.79	1285.3	2570.5	3855.8	5141.1	6426.3
16	.415	.83	.24	.66	.07	.49	.90	.32	.73	4.9	69.7	4.6	39.5	4.4
17	.408	.82	.22	.63	.04	.45	.86	.26	.67	4.5	8.9	3.5	7.9	2.4
18	.402	.80	.21	.61	7.01	.41	.81	.21	.62	4.1	8.2	2.3	6.4	20.5
19	.395	.79	.19	.58	6.97	.37	.77	.16	.56	3.7	7.4	1.1	4.8	18.5
46 20	21.389	42.78	64.17	85.55	106.94	128.33	149.72	171.11	192.50	1283.3	2566.6	3850.0	5133.3	6416.6
21	.382	.76	.15	.53	.91	.29	.68	.06	.44	2.9	5.8	48.8	1.7	4.6
22	.376	.75	.13	.50	.88	.25	.63	1.00	.38	2.5	5.0	7.6	30.1	2.7
23	.369	.74	.11	.48	.84	.21	.59	0.95	.32	2.1	4.3	6.4	28.6	10.7
24	.363	.73	.09	.45	.81	.18	.54	.90	.26	1.8	3.5	5.3	7.0	08.8
46 25	21.356	42.71	64.07	85.42	106.78	128.14	149.50	170.85	192.21	1281.4	2562.7	3844.1	5125.5	6406.8
26	.350	.70	.05	.40	.75	.10	.45	.80	.15	1.0	1.9	2.9	3.9	4.9
27	.343	.69	.03	.37	.72	.06	.41	.74	.09	0.6	1.1	1.8	2.3	2.9
28	.337	.67	4.01	.35	.68	8.02	.36	.69	2.03	80.2	60.4	40.6	20.8	401.0
29	.330	.66	3.99	.32	.65	7.98	.32	.64	1.97	79.8	59.6	39.4	19.2	399.0
46 30	21.324	42.65	63.97	85.29	106.62	127.94	149.27	170.59	191.91	1279.4	2558.8	3838.2	5117.7	6397.1
31	.317	.63	.95	.27	.59	.90	.22	.54	.85	9.0	8.0	7.1	6.1	5.1
32	.311	.62	.93	.24	.55	.86	.18	.48	.79	8.6	7.2	5.9	4.5	3.2
33	.304	.61	.91	.22	.52	.82	.13	.43	.73	8.2	6.5	4.7	3.0	91.2
34	.297	.59	.89	.19	.48	.78	.08	.38	.67	7.8	5.7	3.5	11.4	89.2
46 35	21.291	42.58	63.87	85.16	106.45	127.75	149.04	170.33	191.62	1277.5	2554.9	3832.4	5109.8	6387.3
36	.284	.57	.85	.14	.42	.71	8.99	.28	.56	7.1	4.1	1.2	8.3	5.3
37	.278	.56	.83	.11	.39	.67	.95	.22	.50	6.7	3.3	30.0	6.7	3.4
38	.271	.54	.81	.09	.36	.63	.90	.17	.44	6.3	2.6	28.8	5.1	81.4
39	.265	.53	.79	.06	.32	.59	.86	.12	.38	5.9	1.8	7.7	3.6	79.5
46 40	21.258	42.52	63.77	85.03	106.29	127.55	148.81	170.07	191.32	1275.5	2551.0	3826.5	5102.0	6377.5
41	.252	.50	.75	5.01	.26	.51	.76	70.01	.26	5.1	50.2	5.3	100.4	5.5
42	.245	.49	.74	4.98	.22	.47	.72	69.96	.21	4.7	49.4	4.1	098.9	3.6
43	.239	.48	.72	.96	.19	.43	.67	.91	.15	4.3	8.7	3.0	7.3	71.6
44	.232	.46	.70	.93	.16	.39	.63	.86	.09	3.9	7.9	1.8	5.7	69.6
46 45	21.226	42.45	63.68	84.90	106.12	127.35	148.58	169.80	191.03	1273.5	2547.1	3820.6	5094.1	6367.7
46	.219	.44	.66	.88	.09	.31	.53	.75	0.97	3.1	6.3	19.4	2.6	5.7
47	.213	.43	.64	.85	.06	.28	.49	.70	.91	2.8	5.5	8.3	91.0	3.8
48	.206	.41	.62	.83	6.03	.24	.44	.65	.86	2.4	4.8	7.1	89.4	61.8
49	.199	.40	.60	.80	5.99	.20	.40	.60	.80	2.0	4.0	5.9	7.9	59.8
46 50	21.193	42.39	63.58	84.77	105.96	127.16	148.35	169.54	190.74	1271.6	2543.2	3814.7	5086.3	6357.9
51	.186	.37	.56	.75	.93	.12	.30	.49	.68	1.2	2.4	3.5	4.7	5.9
52	.180	.36	.54	.72	.90	.08	.26	.44	.62	0.8	1.6	2.4	3.1	3.9
53	.173	.35	.52	.69	.86	.04	.21	.39	.56	0.4	0.8	1.2	1.6	2.0
54	.167	.33	.50	.67	.83	7.00	.17	.33	.50	70.0	40.0	10.0	80.0	50.0
46 55	21.160	42.32	63.48	84.64	105.80	126.96	148.12	169.28	190.44	1269.6	2539.2	3808.8	5078.4	6348.0
56	.154	.31	.46	.61	.77	.92	.07	.23	.38	9.2	8.4	7.6	6.9	6.1
57	.147	.29	.44	.59	.74	.88	8.03	.18	.33	8.8	7.6	6.5	5.3	4.1
58	.140	.28	.42	.56	.70	.84	7.98	.12	.27	8.4	6.9	5.3	3.7	2.1
59	.134	.27	.40	.54	.67	.80	.94	.07	.21	8.0	6.1	4.1	2.1	40.2
46 60	21.127	42.25	63.38	84.51	105.64	126.76	147.89	169.02	190.15	1267.6	2535.3	3802.9	5070.6	6338.2

Lat.		Latitude 46° to 47°—Meridional arcs.						Latitude 46°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 46° 30′		Value of 1′	Continuous sums of minutes from latitude 46° 00′		Longitude.	X	Y
°	′	*Meters.*	″	*Meters.*	*Meters.*	′	*Meters.*	° ′	*Meters.*	*Meters.*
46	00	30.875			1852.51					
	1	5	1	30.88	.52	1	1 852.5	0 1	1 291.1	0.1
	2	5	2	61.76	.52	2	3 705.0	2	2 582.2	0.5
	3	5	3	92.63	.53	3	5 557.6	3	3 873.3	1.2
	4	6	4	123.51	.53	4	7 410.1	4	5 164.4	2.2
46	05	30.876	5	154.39	1852.54	5	9 262.6	0 5	6 455.5	3.4
	6	6	6	185.27	.54	6	11 115.2	6	7 746.6	4.9
	7	6	7	216.15	.55	7	12 967.7	7	9 037.6	6.6
	8	6	8	247.02	.55	8	14 820.3	8	10 328.7	8.6
	9	6	9	277.90	.56	9	16 672.8	9	11 619.8	10.9
46	10	30.876	10	308.78	1852.57	10	18 525.4	0 10	12 910.9	13.5
	11	6	1	339.66	.57	1	20 377.9	15	19 366.4	30.4
	12	6	2	370.54	.58	2	22 230.5	20	25 821.8	54.0
	13	6	3	401.41	.58	3	24 083.1	25	32 277.2	84.4
	14	6	4	432.29	.59	4	25 935.7	30	38 732.6	121.6
46	15	30.877	15	463.17	1852.59	15	27 788.3	0 35	45 187.9	165.5
	16	7	6	494.05	.60	6	29 640.9	40	51 643.1	216.1
	17	7	7	524.92	.60	7	31 493.5	45	58 098.4	273.5
	18	7	8	555.80	.61	8	33 346.1	50	64 553.5	337.7
	19	7	9	586.68	.61	9	35 198.7	55	71 008.6	408.6
46	20	30.877	20	617.56	1852.62	20	37 051.3	1 00	77 463.6	486.3
	21	7	1	648.44	.63	1	38 903.9	05	83 918.5	570.7
	22	7	2	679.31	.63	2	40 756.6	10	90 373.3	661.9
	23	7	3	710.19	.64	3	42 609.2	15	96 828.0	759.8
	24	7	4	741.07	.64	4	44 461.8	20	103 282.7	864.5
46	25	30.877	25	771.95	1852.65	25	46 314.5	1 25	109 737.2	975.9
	26	8	6	802.83	.65	6	48 167.1	30	116 191.6	1 094.1
	27	8	7	833.70	.66	7	50 019.8	35	122 645.8	1 219.0
	28	8	8	864.58	.66	8	51 872.4	40	129 099.9	1 350.7
	29	8	9	895.46	.67	9	53 725.1	45	135 553.9	1 489.2
46	30	30.878	30	926.34	1852.68	30	55 577.8	1 50	142 007.8	1 634.4
	31	8	1	957.22	.68	1	57 430.5	55	148 461.4	1 786.3
	32	8	2	988.09	.69	2	59 283.1	2 00	154 915	1 945
	33	8	3	1 018.97	.69	3	61 135.8	3 00	232 342	4 376
	34	8	4	1 049.85	.70	4	62 988.5	4 00	309 732	7 779
46	35	30.878	35	1 080.73	1852.70	35	64 841.2	5 00	387 074	12 153
	36	8	6	1 111.61	.71	6	66 693.9	6 00	464 354	17 498
	37	9	7	1 142.48	.71	7	68 546.6	7 00	541 562	23 813
	38	9	8	1 173.36	.72	8	70 399.4	8 00	618 684	31 096
	39	9	9	1 204.24	.72	9	72 252.1	9 00	695 708	39 347
46	40	30.879	40	1 235.12	1852.73	40	74 104.8	10 00	772 623	48 565
	41	9	1	1 265.99	.74	1	75 957.5	11 00	849 416	58 747
	42	9	2	1 296.87	.74	2	77 810.3	12 00	926 075	69 893
	43	9	3	1 327.75	.75	3	79 663.0	13 00	1 002 588	82 000
	44	9	4	1 358.63	.75	4	81 515.8	14 00	1 078 943	95 067
46	45	30.879	45	1 389.51	1852.76	45	83 368.5	15 00	1 155 128	109 091
	46	9	6	1 420.38	.76	6	85 221.3	16 00	1 231 131	124 071
	47	79	7	1 451.26	.77	7	87 074.1	17 00	1 306 940	140 003
	48	80	8	1 482.14	.77	8	88 926.8	18 00	1 382 543	156 887
	49	0	9	1 513.02	.78	9	90 779.6	19 00	1 457 928	174 718
46	50	30.880	50	1 543.90	1852.78	50	92 632.4	20 00	1 533 083	193 494
	51	0	1	1 574.77	.79	1	94 485.2	21 00	1 607 997	213 212
	52	0	2	1 605.65	.80	2	96 338.0	22 00	1 682 657	233 869
	53	0	3	1 636.53	.80	3	98 190.8	23 00	1 757 052	255 462
	54	0	4	1 667.41	.81	4	100 043.6	24 00	1 831 170	277 987
46	55	30.880	55	1 698.29	1852.81	55	101 896.4	25 00	1 904 999	301 441
	56	0	6	1 729.16	.82	6	103 749.2	26 00	1 978 528	325 820
	57	0	7	1 760.04	.82	7	105 602.0	27 00	2 051 745	351 120
	58	0	8	1 790.92	.83	8	107 454.8	28 00	2 124 639	377 337
	59	1	9	1 821.80	.83	9	109 307.7	29 00	2 197 197	404 468
46	60	30.881	60	1 852.68	1852.84	60	111 160.5	30 00	2 269 410	432 507

Latitude 47° to 48°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
47 00	21.127	42.25	63.38	84.51	105.64	126.76	147.89	169.02	190.15	1267.6	2535.3	3802.9	5070.6	6338.2
1	.121	.24	.36	.48	.61	.72	.84	8.97	.09	7.2	4.5	1.7	69.0	6.2
2	.114	.23	.34	.46	.57	.68	.80	.91	90.03	6.8	3.7	800.5	7.4	4.2
3	.108	.22	.32	.43	.54	.65	.75	.86	89.97	6.5	2.9	799.4	5.8	2.3
4	.101	.20	.30	.40	.51	.61	.71	.81	.91	6.1	2.1	8.2	4.2	30.3
47 05	21.094	42.19	63.28	84.38	105.47	126.57	147.66	168.76	189.85	1265.7	2531.3	3797.0	5062.7	6328.3
6	.088	.18	.26	.35	.44	.53	.61	.70	.79	5.3	30.5	5.8	61.1	6.4
7	.081	.16	.24	.32	.41	.49	.57	.65	.73	4.9	29.7	4.6	59.5	4.4
8	.075	.15	.22	.30	.38	.45	.52	.60	.67	4.5	9.0	3.4	7.9	2.4
9	.068	.14	.20	.27	.34	.41	.48	.54	.61	4.1	8.2	2.3	6.3	20.4
47 10	21.062	42.12	63.18	84.25	105.31	126.37	147.43	168.49	189.55	1263.7	2527.4	3791.1	5054.8	6318.5
11	.055	.11	.16	.22	.28	.33	.38	.44	.49	3.3	6.6	89.9	3.2	6.5
12	.048	.10	.14	.19	.24	.29	.34	.39	.43	2.9	5.8	8.7	1.6	4.5
13	.042	.08	.12	.17	.21	.25	.29	.33	.37	2.5	5.0	7.5	50.0	2.5
14	.035	.07	.10	.14	.18	.21	.25	.28	.31	2.1	4.2	6.3	48.4	10.5
47 15	21.029	42.06	63.09	84.11	105.15	126.17	147.20	168.23	189.26	1261.7	2523.4	3785.1	5046.8	6308.6
16	.022	.04	.07	.09	.11	.13	.15	.18	.20	1.3	2.6	3.9	5.3	6.6
17	.015	.03	.05	.06	.08	.09	.11	.12	.14	0.9	1.8	2.8	3.7	4.6
18	.009	.02	.03	.04	.05	.05	.06	.07	.08	0.5	1.1	1.6	2.1	2.6
19	.002	2.00	3.01	4.01	5.01	6.01	7.02	8.02	9.02	60.1	20.3	80.4	40.5	300.6
47 20	20.996	41.99	62.99	83.98	104.98	125.97	146.97	167.96	188.96	1259.7	2519.5	3779.2	5038.9	6298.7
21	.989	.98	.97	.96	.95	.93	.92	.91	.90	9.3	8.7	8.0	7.3	6.7
22	.982	.96	.95	.93	.91	.89	.88	.86	.84	8.9	7.9	6.8	5.8	4.7
23	.976	.95	.93	.90	.88	.85	.83	.81	.78	8.5	7.1	5.6	4.2	2.7
24	.969	.94	.91	.88	.85	.81	.79	.75	.72	8.1	6.3	4.4	2.6	90.7
47 25	20.962	41.92	62.89	83.85	104.81	125.77	146.74	167.70	188.66	1257.7	2515.5	3773.2	5031.0	6288.7
26	.956	.91	.87	.82	.78	.74	.69	.65	.60	7.4	4.7	2.1	29.4	6.8
27	.949	.90	.85	.80	.75	.70	.65	.59	.54	7.0	3.9	70.9	7.8	4.8
28	.943	.89	.83	.77	.72	.66	.60	.54	.48	6.6	3.1	69.7	6.2	2.8
29	.936	.87	.81	.74	.68	.62	.56	.49	.42	6.2	2.3	8.5	4.6	80.8
47 30	20.929	41.86	62.79	83.72	104.65	125.58	146.51	167.44	188.36	1255.8	2511.5	3767.3	5023.1	6278.8
31	.923	.85	.77	.69	.62	.54	.46	.38	.30	5.4	10.7	6.1	21.5	6.8
32	.916	.83	.75	.66	.58	.50	.42	.33	.24	5.0	09.9	4.9	19.9	4.8
33	.910	.82	.73	.64	.55	.46	.37	.28	.18	4.6	9.1	3.7	8.3	2.9
34	.903	.81	.71	.61	.52	.42	.32	.22	.12	4.2	8.3	2.5	6.7	70.9
47 35	20.896	41.79	62.69	83.58	104.48	125.38	146.28	167.17	188.07	1253.8	2507.5	3761.3	5015.1	6268.9
36	.890	.78	.67	.56	.45	.34	.23	.12	8.01	3.4	6.7	60.1	3.5	6.9
37	.883	.77	.65	.53	.42	.30	.18	.06	7.95	3.0	5.9	58.9	1.9	4.9
38	.876	.75	.63	.51	.39	.26	.13	7.01	.89	2.6	5.2	7.7	10.3	2.9
39	.870	.74	.61	.48	.35	.22	.09	6.96	.83	2.2	4.4	6.5	08.7	60.9
47 40	20.863	41.73	62.59	83.45	104.32	125.18	146.04	166.90	187.77	1251.8	2503.6	3755.4	5007.1	6258.9
41	.856	.71	.57	.43	.29	.14	5.99	.85	.71	1.4	2.8	4.2	5.5	6.9
42	.850	.70	.55	.40	.25	.10	.95	.80	.65	1.0	2.0	3.0	4.0	4.9
43	.843	.69	.53	.37	.22	.06	.90	.75	.59	0.6	1.2	1.8	2.4	2.9
44	.836	.67	.51	.35	.18	5.02	.86	.69	.53	50.2	500.4	50.6	5000.8	50.9
47 45	20.830	41.66	62.49	83.32	104.15	124.98	145.81	166.64	187.47	1249.8	2499.6	3749.4	4999.2	6248.9
46	.823	.65	.47	.29	.12	.94	.76	.59	.41	9.4	8.8	8.2	7.6	7.0
47	.817	.63	.45	.27	.08	.90	.72	.53	.35	9.0	8.0	7.0	6.0	5.0
48	.810	.62	.43	.24	.05	.86	.67	.48	.29	8.6	7.2	5.8	4.4	3.0
49	.803	.61	.41	.21	4.01	.82	.63	.43	.23	8.2	6.4	4.6	2.8	41.0
47 50	20.797	41.59	62.39	83.19	103.98	124.78	145.58	166.37	187.17	1247.8	2495.6	3743.4	4991.2	6239.0
51	.790	.58	.37	.16	.95	.74	.53	.32	.11	7.4	4.8	2.2	89.6	7.0
52	.783	.57	.35	.13	.91	.70	.49	.27	7.05	7.0	4.0	41.0	8.0	5.0
53	.777	.55	.33	.11	.88	.66	.44	.21	6.99	6.6	3.2	39.8	6.4	3.0
54	.770	.54	.31	.08	.85	.62	.39	.16	.93	6.2	2.4	8.6	4.8	31.0
47 55	20.763	41.53	62.29	83.05	103.81	124.58	145.35	166.11	186.87	1245.8	2491.6	3737.4	4983.2	6229.0
56	.757	.51	.27	.03	.78	.54	.30	.05	.81	5.4	0.8	6.2	1.6	7.0
57	.750	.50	.25	3.00	.75	.50	.25	6.00	.75	5.0	90.0	5.0	80.0	5.0
58	.743	.49	.23	2.97	.72	.46	.20	5.95	.69	4.6	89.2	3.8	78.4	3.0
59	.737	.47	.21	.95	.68	.42	.16	.89	.63	4.2	8.4	2.6	6.8	21.0
47 60	20.730	41.46	62.19	82.92	103.65	124.38	145.11	165.84	186.57	1243.8	2487.6	3731.4	4975.2	6219.0

Lat.		Latitude 47° to 48°—Meridional arcs.						Latitude 47°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 47° 30′		Value of 1′	Continuous sums of minutes from latitude 47° 00′		Longitude.	X	Y
°	′	Meters.	″	Meters.	Meters.	′	Meters.	° ′	Meters.	Meters.
47	00	30.881			1852.84					
	1	1	1	30.88	.85	1	1 852.8	0 1	1 267.6	0.1
	2	1	2	61.77	.85	2	3 705.7	2	2 535.3	0.5
	3	1	3	92.65	.86	3	5 558.5	3	3 802.9	1.2
	4	1	4	123.53	.86	4	7 411.4	4	5 070.5	2.2
47	05	30.881	5	154.42	1852.87	5	9 264.3	0 5	6 338.2	3.4
	6	1	6	185.30	.87	6	11 117.1	6	7 605.8	4.8
	7	1	7	216.18	.88	7	12 970.0	7	8 873.5	6.6
	8	1	8	247.07	.88	8	14 822.9	8	10 141.1	8.6
	9	1	9	277.95	.89	9	16 675.8	9	11 408.7	10.9
47	10	30.882	10	308.83	1852.89	10	18 528.7	0 10	12 676.4	13.5
	11	2	1	339.72	.90	1	20 381.6	15	19 014.6	30.3
	12	2	2	370.60	.91	2	22 234.5	20	25 352.7	53.9
	13	2	3	401.48	.91	3	24 087.4	25	31 690.8	84.3
	14	2	4	432.37	.92	4	25 940.3	30	38 028.9	121.4
47	15	30.882	15	463.25	1852.92	15	27 793.2	0 35	44 366.9	165.2
	16	2	6	494.13	.93	6	29 646.1	40	50 704.9	215.7
	17	2	7	525.02	.93	7	31 499.1	45	57 042.9	273.0
	18	2	8	555.90	.94	8	33 352.0	50	63 380.7	337.1
	19	2	9	586.78	.94	9	35 204.9	55	69 718.5	407.9
47	20	30.882	20	617.67	1852.95	20	37 057.9	1 00	76 056.3	485.4
	21	3	1	648.55	.95	1	38 910.8	05	82 393.9	569.7
	22	3	2	679.43	.96	2	40 763.8	10	88 731.4	660.7
	23	3	3	710.32	.97	3	42 616.8	15	95 068.9	758.4
	24	3	4	741.20	.97	4	44 469.7	20	101 406.2	862.9
47	25	30.883	25	772.08	1852.98	25	46 322.7	1 25	107 743.4	974.2
	26	3	6	802.97	.98	6	48 175.7	30	114 080.5	1 092.2
	27	3	7	833.85	.99	7	50 028.7	35	120 417.5	1 216.9
	28	3	8	864.74	2.99	8	51 881.7	40	126 754.3	1 348.3
	29	3	9	895.62	3.00	9	53 734.7	45	133 091.0	1 486.5
47	30	30.883	30	926.50	1853.00	30	55 587.7	1 50	139 427.6	1 631.5
	31	3	1	957.39	.01	1	57 440.7	55	145 764.0	1 783.2
	32	4	2	988.27	.01	2	59 293.7	2 00	152 100	1 942
	33	4	3	1 019.15	.02	3	61 146.7	3 00	228 119	4 368
	34	4	4	1 050.04	.03	4	62 999.7	4 00	304 101	7 765
47	35	30.884	35	1 080.92	1853.03	35	64 852.7	5 00	380 034	12 131
	36	4	6	1 111.80	.04	6	66 705.8	6 00	455 904	17 467
	37	4	7	1 142.69	.04	7	68 558.8	7 00	531 700	23 770
	38	4	8	1 173.57	.05	8	70 411.9	8 00	607 410	31 040
	39	4	9	1 204.45	.05	9	72 264.9	9 00	683 020	39 276
47	40	30.884	40	1 235.34	1853.06	40	74 118.0	10 00	758 520	48 477
	41	4	1	1 266.22	.06	1	75 971.0	11 00	833 895	58 640
	42	4	2	1 297.10	.07	2	77 824.1	12 00	909 135	69 765
	43	5	3	1 327.99	.08	3	79 677.2	13 00	984 227	81 849
	44	5	4	1 358.87	.08	4	81 530.2	14 00	1 059 158	94 890
47	45	30.885	45	1 389.75	1853.09	45	83 383.3	15 00	1 133 917	108 887
	46	5	6	1 420.64	.09	6	85 236.4	16 00	1 208 491	123 837
	47	5	7	1 451.52	.10	7	87 089.5	17 00	1 282 868	139 738
	48	5	8	1 482.40	.10	8	88 942.6	18 00	1 357 036	156 587
	49	5	9	1 513.29	.11	9	90 795.7	19 00	1 430 984	174 381
47	50	30.885	50	1 544.17	1853.11	50	92 648.8	20 00	1 504 697	193 118
	51	5	1	1 575.05	.12	1	94 501.9	21 00	1 578 166	212 793
	52	5	2	1 605.94	.12	2	96 355.1	22 00	1 651 377	233 405
	53	5	3	1 636.82	.13	3	98 208.2	23 00	1 724 320	254 950
	54	6	4	1 667.70	.14	4	100 061.3	24 00	1 796 982	277 425
47	55	30.886	55	1 698.59	1853.14	55	101 914.5	25 00	1 869 351	300 824
	56	6	6	1 729.47	.15	6	103 767.6	26 00	1 941 415	325 146
	57	6	7	1 760.35	.15	7	105 620.8	27 00	2 013 163	350 386
	58	6	8	1 791.24	.16	8	107 473.9	28 00	2 084 583	376 539
	59	6	9	1 822.12	.16	9	109 327.1	29 00	2 155 663	403 602
47	60	30.886	60	1 853.00	1853.17	60	111 180.2	30 00	2 226 392	431 569

Latitude 48° to 49°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
48 00	20.730	41.46	62.19	82.92	103.65	124.38	145.11	165.84	186.57	1243.8	2487.6	3731.4	4975.2	6219.0
1	.723	.45	.17	.89	.62	.34	.06	.79	.51	3.4	6.8	30.2	3.6	7.0
2	.717	.43	.15	.87	.58	.30	5.02	.73	.45	3.0	6.0	29.0	2.0	5.0
3	.710	.42	.13	.84	.55	.26	4.97	.68	.39	2.6	5.2	7.8	70.4	3.0
4	.703	.41	.11	.81	.52	.22	.92	.63	.33	2.2	4.4	6.6	68.8	10.9
48 05	20.696	41.39	62.09	82.79	103.48	124.18	144.88	165.57	186.27	1241.8	2483.6	3725.4	4967.2	6208.9
6	.690	.38	.07	.76	.45	.14	.83	.52	.21	1.4	2.8	4.2	5.5	6.9
7	.683	.37	.05	.73	.42	.10	.78	.46	.15	1.0	2.0	3.0	3.9	4.9
8	.676	.35	.03	.71	.39	.06	.73	.41	.09	0.6	1.2	1.8	2.3	2.9
9	.670	.34	2.01	.68	.35	4.02	.69	.36	6.03	40.2	80.4	20.6	60.7	200.9
48 10	20.663	41.33	61.99	82.65	103.32	123.98	144.64	165.30	185.97	1239.8	2479.6	3719.4	4959.1	6198.9
11	.656	.31	.97	.63	.29	.94	.59	.25	.91	9.4	8.8	8.1	7.5	6.9
12	.650	.30	.95	.60	.25	.90	.55	.20	.85	9.0	8.0	6.9	5.9	4.9
13	.643	.29	.93	.57	.22	.86	.50	.14	.79	8.6	7.1	5.7	4.3	2.9
14	.636	.27	.91	.54	.18	.82	.45	.09	.73	8.2	6.3	4.5	2.7	90.9
48 15	20.630	41.26	61.89	82.52	103.15	123.78	144.41	165.04	185.66	1237.8	2475.5	3713.3	4951.1	6188.9
16	.623	.25	.87	.49	.12	.74	.36	4.98	.60	7.4	4.7	2.1	49.5	6.8
17	.616	.23	.85	.46	.08	.70	.31	.93	.54	7.0	3.9	10.9	7.9	4.8
18	.609	.22	.83	.44	.05	.66	.26	.88	.48	6.6	3.1	09.7	6.3	2.8
19	.603	.21	.81	.41	3.01	.62	.22	.82	.42	6.2	2.3	8.5	4.7	80.8
48 20	20.596	41.19	61.79	82.38	102.98	123.58	144.17	164.77	185.36	1235.8	2471.5	3707.3	4943.0	6178.8
21	.589	.18	.77	.36	.95	.54	.12	.71	.30	5.4	70.7	6.1	41.4	6.8
22	.583	.17	.75	.33	.91	.50	.08	.66	.24	5.0	69.9	4.9	39.8	4.8
23	.576	.15	.73	.30	.88	.46	4.03	.61	.18	4.6	9.1	3.7	8.2	2.8
24	.569	.14	.71	.28	.85	.42	3.98	.55	.12	4.2	8.3	2.5	6.6	70.8
48 25	20.562	41.12	61.69	82.25	102.81	123.37	143.93	164.50	185.06	1233.7	2467.5	3701.2	4935.0	6168.7
26	.556	.11	.67	.22	.78	.33	.89	.45	5.00	3.3	6.7	700.0	3.4	6.7
27	.549	.10	.65	.20	.74	.29	.84	.39	4.94	2.9	5.9	698.8	1.8	4.7
28	.542	.08	.63	.17	.71	.25	.79	.34	.88	2.5	5.1	7.6	30.1	2.7
29	.536	.07	.61	.14	.67	.21	.75	.28	.82	2.1	4.3	6.4	28.5	60.7
48 30	20.529	41.06	61.59	82.12	102.64	123.17	143.70	164.23	184.76	1231.7	2463.5	3695.2	4926.9	6158.7
31	.522	.04	.57	.09	.61	.13	.65	.18	.70	1.3	2.7	4.0	5.3	6.6
32	.515	.03	55	.06	.57	.09	.61	.12	.64	0.9	1.9	2.8	3.7	4.6
33	.509	.02	.53	.03	.54	.05	.56	.07	.58	0.5	1.0	1.5	2.1	2.6
34	.502	1.00	.51	2.01	.51	3.01	.51	4.01	.52	30.1	60.2	90.3	20.4	50.6
48 35	20.495	40.99	61.48	81.98	102.47	122.97	143.47	163.96	184.45	1229.7	2459.4	3689.1	4918.8	6148.5
36	.488	.98	.46	.95	.44	.93	.42	.91	.39	9.3	8.6	7.9	7.2	6.5
37	.482	.96	.44	.93	.41	.89	.37	.85	.33	8.9	7.8	6.7	5.6	4.5
38	.475	.95	.42	.90	.38	.85	.32	.80	.27	8.5	7.0	5.5	4.0	2.5
39	.468	.94	.40	.87	.34	.81	.28	.75	.21	8.1	6.2	4.3	2.4	40.5
48 40	20.461	40.92	61.38	81.85	102.31	122.77	143.23	163.69	184.15	1227.7	2455.4	3683.1	4910.7	6138.4
41	.455	.91	.36	.82	.28	.73	.18	.64	.09	7.3	4.6	1.8	09.1	6.4
42	.448	.90	.34	.79	.24	.69	.14	.58	4.03	6.9	3.8	80.6	7.5	4.4
43	.441	.88	.32	.76	.21	.65	.09	.53	3.97	6.5	2.9	79.4	5.9	2.4
44	.434	.87	.30	.74	.17	.61	.04	.48	.91	6.1	2.1	8.2	4.3	30.3
48 45	20.428	40.86	61.28	81.71	102.14	122.57	143.00	163.42	183.85	1225.7	2451.3	3677.0	4902.6	6128.3
46	.421	.84	.26	.68	.11	.53	2.95	.37	.79	5.3	50.5	5.8	901.0	6.3
47	.414	.83	.24	.66	.07	.48	.90	.31	.73	4.8	49.7	4.5	899.4	4.2
48	.407	.81	.22	.63	.04	.44	.85	.26	.67	4.4	8.9	3.3	7.8	2.2
49	.401	.80	.20	.60	2.00	.40	.81	.21	.61	4.0	8.1	2.1	6.2	20.2
48 50	20.394	40.79	61.18	81.58	101.97	122.36	142.76	163.15	183.55	1223.6	2447.3	3670.9	4894.5	6118.2
51	.387	.77	.16	.55	.94	.32	.71	.10	.49	3.2	6.5	69.7	2.9	6.1
52	.380	.76	.14	.52	.90	.28	.66	3.04	.43	2.8	5.7	8.5	91.3	4.1
53	.374	.75	.12	.49	.87	.24	.62	2.99	.36	2.4	4.8	7.2	89.7	2.1
54	.367	.73	.10	.47	.83	.20	.57	.93	.30	2.0	4.0	6.0	8.0	10.0
48 55	20.360	40.72	61.08	81.44	101.80	122.16	142.52	162.88	183.24	1221.6	2443.2	3664.8	4886.4	6108.0
56	.353	.71	.06	.41	.77	.12	.47	.83	.18	1.2	2.4	3.6	4.8	6.0
57	.346	.69	.04	.39	.73	.08	.42	.77	.12	0.8	1.6	2.4	3.1	3.9
58	.340	.68	.02	.36	.70	.04	.38	.72	3.05	0.4	40.7	61.1	81.5	101.9
59	.333	.67	1.00	.33	.66	2.00	.33	.66	2.99	20.0	39.9	59.9	79.9	099.9
48 60	20.326	40.65	60.98	81.30	101.63	121.96	142.28	162.61	182.93	1219.6	2439.1	3658.7	4878.3	6097.8

Lat.		Latitude 48° to 49°—Meridional arcs.						Latitude 48°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 48° 30′		Value of 1′	Continuous sums of minutes from latitude 48° 00′		Longitude.	X	Y
°	′	Meters.	″	Meters.	Meters.	′	Meters.	° ′	Meters.	Meters.
48	00	30. 886			1853. 17					
	1	6	1	30. 89	. 17	1	1 853. 2	0 1	1 243. 8	0. 1
	2	6	2	61. 78	. 18	2	3 706. 3	2	2 487. 6	0. 5
	3	6	3	92. 67	. 18	3	5 559. 5	3	3 731. 4	1. 2
	4	6	4	123. 56	. 19	4	7 412. 7	4	4 975. 2	2. 1
48	05	30. 887	5	154. 44	1853. 20	5	9 265. 9	0 5	6 219. 0	3. 3
	6	7	6	185. 33	. 20	6	11 119. 1	6	7 462. 8	4. 8
	7	7	7	216. 22	. 21	7	12 972. 3	7	8 706. 6	6. 6
	8	7	8	247. 11	. 21	8	14 825. 5	8	9 950. 4	8. 6
	9	7	9	278. 00	. 22	9	16 678. 7	9	11 194. 2	10. 9
48	10	30. 887	10	308. 89	1853. 22	10	18 531. 9	0 10	12 437. 9	13. 4
	11	7	1	339. 78	. 23	1	20 385. 2	15	18 656. 9	30. 2
	12	7	2	370. 67	. 23	2	22 238. 4	20	24 875. 8	53. 8
	13	7	3	401. 56	. 24	3	24 091. 6	25	31 094. 7	84. 0
	14	7	4	432. 44	. 24	4	25 944. 9	30	37 313. 6	121. 0
48	15	30. 887	15	463. 33	1853. 25	15	27 798. 1	0 35	43 532. 4	164. 7
	16	8	6	494. 22	. 26	6	29 651. 4	40	49 751. 2	215. 1
	17	8	7	525. 11	. 26	7	31 504. 6	45	55 969. 9	272. 2
	18	8	8	556. 00	. 27	8	33 357. 9	50	62 188. 5	336. 1
	19	8	9	586. 89	. 27	9	35 211. 2	55	68 407. 1	406. 7
48	20	30. 888	20	617. 78	1853. 28	20	37 064. 4	1 00	74 625. 6	484. 0
	21	8	1	648. 67	. 28	1	38 917. 7	05	80 844. 0	568. 0
	22	8	2	679. 56	. 29	2	40 771. 0	10	87 062. 3	658. 7
	23	8	3	710. 44	. 29	3	42 624. 3	15	93 280. 5	756. 2
	24	8	4	741. 33	. 30	4	44 477. 6	20	99 498. 6	860. 4
48	25	30. 888	25	772. 22	1853. 30	25	46 330. 9	1 25	105 716. 6	971. 3
	26	8	6	803. 11	. 31	6	48 184. 2	30	111 934. 5	1 088. 9
	27	9	7	834. 00	. 32	7	50 037. 5	35	118 152. 2	1 213. 2
	28	9	8	864. 89	. 32	8	51 890. 8	40	124 369. 8	1 344. 3
	29	9	9	895. 78	. 33	9	53 744. 2	45	130 587. 3	1 482. 1
48	30	30. 889	30	926. 67	1853. 33	30	55 597. 5	1 50	136 804. 6	1 626. 6
	31	9	1	957. 55	. 34	1	57 450. 8	55	143 021. 7	1 777. 8
	32	9	2	988. 44	. 34	2	59 304. 2	2 00	149 239	1 936
	33	9	3	1 019. 33	. 35	3	61 157. 5	3 00	223 827	4 355
	34	9	4	1 050. 22	. 35	4	63 010. 9	4 00	298 377	7 742
48	35	30. 889	35	1 081. 11	1853. 36	35	64 864. 2	5 00	372 877	12 095
	36	9	6	1 112. 00	. 36	6	66 717. 6	6 00	447 314	17 414
	37	89	7	1 142. 89	. 37	7	68 570. 9	7 00	521 677	23 698
	38	90	8	1 173. 78	. 38	8	70 424. 3	8 00	595 951	30 946
	39	0	9	1 204. 67	. 38	9	72 277. 7	9 00	670 125	39 157
48	40	30. 890	40	1 235. 55	1853. 39	40	74 131. 1	10 00	744 186	48 329
	41	0	1	1 266. 44	. 39	1	75 984. 5	11 00	818 123	58 461
	42	0	2	1 297. 33	. 40	2	77 837. 9	12 00	891 921	69 552
	43	0	3	1 328. 22	. 40	3	79 691. 3	13 00	965 570	81 598
	44	0	4	1 359. 11	. 41	4	81 544. 7	14 00	1 039 056	94 598
48	45	30. 890	45	1 390. 00	1853. 41	45	83 398. 1	15 00	1 112 367	108 551
	46	0	6	1 420. 89	. 42	6	85 251. 5	16 00	1 185 491	123 453
	47	0	7	1 451. 78	. 42	7	87 104. 9	17 00	1 258 416	139 302
	48	0	8	1 482. 67	. 43	8	88 958. 3	18 00	1 331 129	156 096
	49	1	9	1 513. 55	. 44	9	90 811. 8	19 00	1 403 618	173 832
48	50	30. 891	50	1 544. 44	1853. 44	50	92 665. 2	20 00	1 475 871	192 506
	51	1	1	1 575. 33	. 45	1	94 518. 7	21 00	1 547 876	212 116
	52	1	2	1 606. 22	. 45	2	96 372. 1	22 00	1 619 620	232 658
	53	1	3	1 637. 11	. 46	3	98 225. 6	23 00	1 691 091	254 128
	54	1	4	1 668. 00	. 46	4	100 079. 0	24 00	1 762 279	276 524
48	55	30. 891	55	1 698. 89	1853. 47	55	101 932. 5	25 00	1 833 170	299 842
	56	1	6	1 729. 78	. 47	6	103 786. 0	26 00	1 903 752	324 077
	57	1	7	1 760. 67	. 48	7	105 639. 4	27 00	1 974 015	349 225
	58	1	8	1 791. 55	. 48	8	107 492. 9	28 00	2 043 945	375 283
	59	1	9	1 822. 44	. 49	9	109 346. 4	29 00	2 113 531	402 245
48	60	30. 892	60	1 853. 33	1853. 50	60	111 199. 9	30 00	2 182 762	430 107

Latitude 49° to 50°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
49 00	20.326	40.65	60.98	81.30	101.63	121.96	142.28	162.61	182.93	1219.6	2439.1	3658.7	4878.3	6097.8
1	.319	.64	.96	.28	.60	.92	.23	.55	.87	9.2	8.3	7.5	6.6	5.8
2	.313	.63	.94	.25	.56	.88	.19	.50	.81	8.8	7.5	6.3	5.0	3.8
3	.306	.61	.92	.22	.53	.83	.14	.45	.75	8.3	6.7	5.0	3.4	91.7
4	.299	.60	.90	.20	.49	.79	.09	.39	.69	7.9	5.9	3.8	1.8	89.7
49 05	20.292	40.58	60.88	81.17	101.46	121.75	142.04	162.34	182.63	1217.5	2435.1	3652.6	4870.1	6087.7
6	.285	.57	.86	.14	.43	.71	2.00	.28	.57	7.1	4.3	1.4	68.5	5.6
7	.279	.56	.84	.12	.39	.67	1.95	.23	.51	6.7	3.5	50.2	6.9	3.6
8	.272	.54	.81	.09	.36	.63	.90	.17	.44	6.3	2.6	48.9	5.2	81.5
9	.265	.53	.79	.06	.32	.59	.86	.12	.38	5.9	1.8	7.7	3.6	79.5
49 10	20.258	40.52	60.77	81.03	101.29	121.55	141.81	162.07	182.32	1215.5	2431.0	3646.5	4862.0	6077.5
11	.251	.50	.75	1.01	.26	.51	.76	2.01	.26	5.1	30.2	5.3	60.3	5.4
12	.245	.49	.73	0.98	.22	.47	.71	1.96	.20	4.7	29.4	4.0	58.7	3.4
13	.238	.48	.71	.95	.19	.43	.67	.90	.14	4.3	8.5	2.8	7.1	71.3
14	.231	.46	.69	.92	.15	.39	.62	.85	.08	3.9	7.7	1.6	5.4	69.3
49 15	20.224	40.45	60.67	80.90	101.12	121.35	141.57	161.79	182.02	1213.5	2426.9	3640.4	4853.8	6067.3
16	.217	.43	.65	.87	.09	.30	.52	.74	1.95	3.0	6.1	39.1	2.2	5.2
17	.211	.42	.63	.84	.05	.26	.47	.68	.89	2.6	5.3	7.9	50.5	3.2
18	.204	.41	.61	.81	1.02	.22	.43	.63	.83	2.2	4.4	6.7	48.9	61.1
19	.197	.39	.59	.79	0.98	.18	.38	.58	.77	1.8	3.6	5.5	7.3	59.1
49 20	20.190	40.38	60.57	80.76	100.95	121.14	141.33	161.52	181.71	1211.4	2422.8	3634.2	4845.6	6057.1
21	.183	.37	.55	.73	.92	.10	.28	.47	.65	1.0	2.0	3.0	4.0	5.0
22	.177	.35	.53	.71	.88	.06	.23	.41	.59	0.6	1.2	1.8	2.4	3.0
23	.170	.34	.51	.68	.85	1.02	.19	.36	.53	10.2	20.3	30.5	40.7	50.9
24	.163	.33	.49	.65	.81	0.98	.14	.30	.47	09.8	19.5	29.3	39.1	48.9
49 25	20.156	40.31	60.47	80.62	100.78	120.94	141.09	161.25	181.41	1209.4	2418.7	3628.1	4837.4	6046.8
26	.149	.30	.45	.60	.75	.90	1.04	.19	.34	9.0	7.9	6.9	5.8	4.8
27	.142	.28	.43	.57	.71	.85	0.99	.14	.28	8.5	7.1	5.6	4.2	2.7
28	.136	.27	.41	.54	.68	.81	.95	.08	.22	8.1	6.2	4.4	2.5	40.7
29	.129	.26	.39	.51	.64	.77	.90	1.03	.16	7.7	5.4	3.2	30.9	38.6
49 30	20.122	40.24	60.37	80.49	100.61	120.73	140.85	160.98	181.10	1207.3	2414.6	3621.9	4829.3	6036.6
31	.115	.23	.35	.46	.58	.69	.80	.92	1.04	6.9	3.8	20.7	7.6	4.5
32	.108	.22	.33	.43	.54	.65	.75	.87	0.98	6.5	3.0	19.5	6.0	2.5
33	.101	.20	.30	.40	.51	.61	.71	.81	.91	6.1	2.1	8.2	4.3	30.4
34	.095	.19	.28	.38	.47	.57	.66	.76	.85	5.7	1.3	7.0	2.7	28.4
49 35	20.088	40.18	60.26	80.35	100.44	120.53	140.61	160.70	180.79	1205.3	2410.5	3615.8	4821.0	6026.3
36	.081	.16	.24	.32	.41	.49	.56	.65	.73	4.9	09.7	4.5	19.4	4.3
37	.074	.15	.22	.30	.37	.44	.51	.59	.67	4.4	8.9	3.3	7.8	2.2
38	.067	.13	.20	.27	.34	.40	.47	.54	.60	4.0	8.0	2.1	6.1	20.1
39	.060	.12	.18	.24	.30	.36	.42	.48	.54	3.6	7.2	10.9	4.5	18.1
49 40	20.053	40.11	60.16	80.21	100.27	120.32	140.37	160.43	180.48	1203.2	2406.4	3609.6	4812.8	6016.0
41	.047	.09	.14	.19	.24	.28	.32	.37	.42	2.8	5.6	8.4	11.2	4.0
42	.040	.08	.12	.16	.20	.24	.27	.32	.36	2.4	4.8	7.2	09.5	11.9
43	.033	.07	.10	.13	.17	.20	.23	.26	.29	2.0	3.9	5.9	7.9	09.9
44	.026	.05	.08	.10	.13	.16	.18	.21	.23	1.6	3.1	4.7	6.2	7.8
49 45	20.019	40.04	60.06	80.08	100.10	120.12	140.13	160.15	180.17	1201.2	2402.3	3603.4	4804.6	6005.8
46	.012	.02	.04	.05	.06	.07	.08	.10	.11	0.7	1.5	2.2	3.0	3.7
47	.005	.01	.02	80.02	100.02	20.03	40.03	60.04	80.05	200.3	400.7	601.0	801.3	6001.6
48	19.999	40.00	60.00	79.99	99.99	19.99	39.99	59.99	79.98	199.9	399.8	599.7	799.7	5999.6
49	.992	39.98	59.97	.97	.95	.95	.94	.93	.92	9.5	9.0	8.5	8.0	7.5
49 50	19.985	39.97	59.95	79.94	99.92	119.91	139.89	159.88	179.86	1199.1	2398.2	3597.3	4796.4	5995.5
51	.978	.96	.93	.91	.89	.87	.84	.82	.80	8.7	7.4	6.0	4.7	3.4
52	.971	.94	.91	.89	.85	.83	.80	.77	.74	8.3	6.6	4.8	3.1	91.3
53	.964	.93	.89	.86	.82	.79	.75	.71	.68	7.9	5.7	3.6	91.4	89.3
54	.957	.91	.87	.83	.78	.74	.70	.66	.61	7.4	4.9	2.3	89.8	7.2
49 55	19.950	39.90	59.85	79.80	99.75	119.70	139.65	159.60	179.55	1197.0	2394.1	3591.1	4788.1	5985.1
56	.944	.89	.83	.78	.72	.66	.60	.55	.49	6.6	3.3	89.9	6.5	3.1
57	.937	.87	.81	.75	.68	.62	.55	.49	.43	6.2	2.4	8.6	4.8	81.0
58	.930	.86	.79	.72	.65	.58	.51	.44	.37	5.8	1.6	7.4	3.2	79.0
59	.923	.85	.77	.69	.61	.54	.46	.38	.30	5.4	90.7	6.1	81.5	6.9
49 60	19.916	39.83	59.75	79.66	99.58	119.50	139.41	159.33	179.24	1195.0	2389.9	3584.9	4779.9	5974.8

Lat.		Latitude 49° to 50°—Meridional arcs.						Latitude 49°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 49° 30′		Value of 1′	Continuous sums of minutes from latitude 49° 00′		Longitude.	X	Y
°	′	Meters	″	Meters.	Meters.	′	Meters.	° ′	Meters.	Meters.
49	00	30. 892			1853. 50					
	1	2	1	30. 89	. 50	1	1 853. 5	0 1	1 219. 6	0. 1
	2	2	2	61. 79	. 51	2	3 707. 0	2	2 439. 1	0. 5
	3	2	3	92. 68	. 51	3	5 560. 5	3	3 658. 7	1. 2
	4	2	4	123. 58	. 52	4	7 414. 0	4	4 878. 3	2. 1
49	05	30. 892	5	154. 47	1853. 52	5	9 267. 5	0 5	6 097. 9	3. 3
	6	2	6	185. 37	. 53	6	11 121. 1	6	7 317. 5	4. 8
	7	2	7	216. 26	. 53	7	12 974. 6	7	8 537. 0	6. 6
	8	2	8	247. 15	. 54	8	14 828. 1	8	9 756. 6	8. 6
	9	2	9	278. 05	. 54	9	16 681. 7	9	10 976. 2	10. 8
49	10	30. 892	10	308. 94	1853. 55	10	18 535. 2	0 10	12 195. 8	13. 4
	11	3	1	339. 84	. 55	1	20 388. 8	15	18 293. 6	30. 1
	12	3	2	370. 73	. 56	2	22 242. 3	20	24 391. 3	53. 5
	13	3	3	401. 63	. 57	3	24 095. 9	25	30 489. 1	83. 7
	14	3	4	432. 52	. 57	4	25 949. 5	30	36 586. 8	120. 5
49	15	30. 893	15	463. 41	1853. 58	15	27 803. 0	0 35	42 684. 5	164. 0
	16	3	6	494. 31	. 58	6	29 656. 6	40	48 782. 1	214. 2
	17	3	7	525. 20	. 59	7	31 510. 2	45	54 879. 7	271. 1
	18	3	8	556. 10	. 59	8	33 363. 8	50	60 977. 2	334. 7
	19	3	9	586. 99	. 60	9	35 217. 4	55	67 074. 7	404. 9
49	20	30. 893	20	617. 89	1853. 60	20	37 071. 0	1 00	73 172. 0	481. 9
	21	3	1	648. 78	. 61	1	38 924. 6	05	79 269. 3	565. 6
	22	4	2	679. 67	. 61	2	40 778. 2	10	85 366. 5	656. 0
	23	4	3	710. 57	. 62	3	42 631. 8	15	91 463. 6	753. 0
	24	4	4	741. 46	. 63	4	44 485. 4	20	97 560. 5	856. 7
49	25	30. 894	25	772. 36	1853. 63	25	46 339. 1	1 25	103 657. 4	967. 2
	26	4	6	803. 25	. 64	6	48 192. 7	30	109 754. 1	1 084. 3
	27	4	7	834. 15	. 64	7	50 046. 3	35	115 850. 7	1 208. 1
	28	4	8	865. 04	. 65	8	51 900. 0	40	121 947. 1	1 338. 6
	29	4	9	895. 93	. 65	9	53 753. 6	45	128 043. 4	1 475. 9
49	30	30. 894	30	926. 83	1853. 66	30	55 607. 3	1 50	134 139. 6	1 619. 8
	31	4	1	957. 72	. 66	1	57 461. 0	55	140 235. 5	1 770. 4
	32	4	2	988. 62	. 67	2	59 314. 6	2 00	146 331	1 928
	33	5	3	1 019. 51	. 67	3	61 168. 3	3 00	219 465	4 337
	34	5	4	1 050. 41	. 68	4	63 022. 0	4 00	292 561	7 709
49	35	30. 895	35	1 081. 30	1853. 69	35	64 875. 7	5 00	365 606	12 044
	36	5	6	1 112. 19	. 69	6	66 729. 4	6 00	438 588	17 340
	37	5	7	1 143. 09	. 70	7	68 583. 0	7 00	511 493	23 598
	38	5	8	1 173. 98	. 70	8	70 436. 7	8 00	584 310	30 815
	39	5	9	1 204. 88	. 71	9	72 290. 4	9 00	657 026	38 991
49	40	30. 895	40	1 235. 77	1853. 71	40	74 144. 2	10 00	729 627	48 123
	41	5	1	1 266. 67	. 72	1	75 997. 9	11 00	802 102	58 212
	42	5	2	1 297. 56	. 72	2	77 851. 6	12 00	874 438	69 254
	43	5	3	1 328. 46	. 73	3	79 705. 3	13 00	946 622	81 248
	44	6	4	1 359. 35	. 73	4	81 559. 1	14 00	1 018 642	94 191
49	45	30. 896	45	1 390. 24	1853. 74	45	83 412. 8	15 00	1 090 485	108 082
	46	6	6	1 421. 14	. 75	6	85 266. 5	16 00	1 162 138	122 918
	47	6	7	1 452. 03	. 75	7	87 120. 3	17 00	1 233 591	138 697
	48	6	8	1 482. 93	. 76	8	88 974. 0	18 00	1 304 829	155 416
	49	6	9	1 513. 82	. 76	9	90 827. 8	19 00	1 375 840	173 071
49	50	30. 896	50	1 544. 72	1853. 77	50	92 681. 6	20 00	1 446 613	191 660
	51	6	1	1 575. 61	. 77	1	94 535. 3	21 00	1 517 135	211 180
	52	6	2	1 606. 50	. 78	2	96 389. 1	22 00	1 587 394	231 627
	53	6	3	1 637. 40	. 78	3	98 242. 9	23 00	1 657 378	252 998
	54	6	4	1 668. 29	. 79	4	100 096. 7	24 00	1 727 073	275 288
49	55	30. 897	55	1 699. 19	1853. 79	55	101 950. 5	25 00	1 796 470	298 495
	56	7	6	1 730. 08	. 80	6	103 804. 3	26 00	1 865 554	322 614
	57	7	7	1 760. 98	. 80	7	105 658. 1	27 00	1 934 315	347 640
	58	7	8	1 791. 87	. 81	8	107 511. 9	28 00	2 002 740	373 570
	59	7	9	1 822. 76	. 82	9	109 365. 7	29 00	2 070 817	400 399
49	60	30. 897	60	1 853. 66	1853. 82	60	111 219. 5	30 00	2 138 536	428 123

Latitude 50° to 51°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
50 00	19.916	39.83	59.75	79.66	99.58	119.50	139.41	159.33	179.24	1195.0	2389.9	3584.9	4779.9	5974.8
1	.909	.82	.73	.64	.55	.46	.36	.27	.18	4.6	9.1	3.7	8.2	2.8
2	.902	.80	.71	.61	.51	.41	.31	.22	.12	4.1	8.3	2.4	6.6	70.7
3	.895	.79	.69	.58	.48	.37	.27	.16	9.06	3.7	7.4	81.2	4.9	68.6
4	.889	.78	.67	.55	.44	.33	.22	.11	9.00	3.3	6.6	79.9	3.2	6.6
50 05	19.882	39.76	59.64	79.53	99.41	119.29	139.17	159.05	178.93	1192.9	2385.8	3578.7	4771.6	5964.5
6	.875	.75	.62	.50	.38	.25	.12	9.00	.87	2.5	5.0	7.5	69.9	2.4
7	.868	.74	.60	.47	.34	.21	.07	8.94	.81	2.1	4.2	6.2	8.3	60.4
8	.861	.72	.58	.44	.31	.17	9.03	.89	.75	1.7	3.3	5.0	6.6	58.3
9	.854	.71	.56	.42	.27	.12	8.98	.83	.68	1.2	2.5	3.7	5.0	6.2
50 10	19.847	39.69	59.54	79.39	99.24	119.08	138.93	158.78	178.62	1190.8	2381.7	3572.5	4763.3	5954.2
11	.840	.68	.52	.36	.21	.04	.88	.72	.56	0.4	0.8	1.3	1.7	2.1
12	.833	.67	.50	.33	.17	9.00	.83	.67	.50	90.0	80.0	70.0	60.0	50.0
13	.826	.65	.48	.31	.14	8.96	.79	.61	.44	89.6	79.2	68.8	58.3	47.9
14	.820	.64	.46	.28	.10	.92	.74	.56	.37	9.2	8.3	7.5	6.7	5.9
50 15	19.813	39.63	59.44	79.25	99.07	118.88	138.69	158.50	178.31	1188.8	2377.5	3566.3	4755.0	5943.8
16	.806	.61	.42	.22	.03	.83	.64	.45	.25	8.3	6.7	5.0	3.4	41.7
17	.799	.60	.40	.20	9.00	.79	.59	.39	.19	7.9	5.9	3.8	1.7	39.6
18	.792	.58	.38	.17	8.96	.75	.55	.34	.13	7.5	5.0	2.5	50.1	7.6
19	.785	.57	.35	.14	.93	.71	.50	.28	.06	7.1	4.2	1.3	48.4	5.5
50 20	19.778	39.56	59.33	79.11	98.89	118.67	138.45	158.22	178.00	1186.7	2373.4	3560.1	4746.7	5933.4
21	.771	.54	.31	.09	.86	.63	.40	.17	7.94	6.3	2.6	58.8	5.1	31.4
22	.764	.53	.29	.06	.82	.59	.35	.11	.88	5.9	1.7	7.6	3.4	29.3
23	.757	.51	.27	.03	.79	.54	.30	.06	.81	5.4	0.9	6.3	1.8	7.2
24	.750	.50	.25	9.00	.75	.50	.25	8.00	.75	5.0	70.0	5.1	40.1	5.1
50 25	19.743	39.49	59.23	78.97	98.72	118.46	138.21	157.95	177.69	1184.6	2369.2	3553.8	4738.4	5923.0
26	.737	.47	.21	.95	.68	.42	.16	.89	.63	4.2	8.4	2.6	6.8	21.0
27	.730	.46	.19	.92	.65	.38	.11	.84	.57	3.8	7.6	1.3	5.1	18.9
28	.723	.45	.17	.89	.61	.34	.06	.78	.50	3.4	6.7	50.1	3.4	6.8
29	.716	.43	.15	.86	.58	.29	8.01	.73	.44	2.9	5.9	48.8	1.8	4.7
50 30	19.709	39.42	59.13	78.84	98.54	118.25	137.96	157.67	177.38	1182.5	2365.1	3547.6	4730.1	5912.6
31	.702	.40	.11	.81	.51	.21	.91	.61	.32	2.1	4.2	6.3	28.4	10.6
32	.695	.39	.09	.78	.47	.17	.86	.56	.25	1.7	3.4	5.1	6.8	08.5
33	.688	.38	.06	.75	.44	.13	.82	.50	.19	1.3	2.6	3.8	5.1	6.4
34	.681	.36	.04	.72	.40	.09	.77	.45	.13	0.9	1.7	2.6	3.5	4.3
50 35	19.674	39.35	59.02	78.70	98.37	118.04	137.72	157.39	177.06	1180.4	2360.9	3541.3	4721.8	5902.2
36	.667	.33	9.00	.67	.34	8.00	.67	.34	7.00	80.0	60.1	40.1	20.1	900.1
37	.660	.32	8.98	.64	.30	7.96	.62	.28	6.94	79.6	59.2	38.8	18.5	898.1
38	.653	.31	.96	.61	.27	.92	.58	.23	.88	9.2	8.4	7.6	6.8	6.0
39	.646	.29	.94	.58	.23	.88	.53	.17	.81	8.8	7.5	6.3	5.1	3.9
50 40	19.639	39.28	58.92	78.56	98.20	117.84	137.48	157.12	176.75	1178.4	2356.7	3535.1	4713.5	5891.8
41	.632	.26	.90	.53	.16	.79	.43	.06	.69	7.9	5.9	3.8	1.8	89.7
42	.625	.25	.88	.50	.13	.75	.38	7.00	.63	7.5	5.1	2.6	10.1	7.6
43	.618	.24	.86	.47	.10	.71	.33	6.95	.56	7.1	4.2	1.3	08.4	5.5
44	.612	.22	.84	.45	.06	.67	.28	.89	.50	6.7	3.4	30.1	6.8	3.5
50 45	19.605	39.21	58.81	78.42	98.03	117.63	137.24	156.84	176.44	1176.3	2352.6	3528.8	4705.1	5881.4
46	.598	.20	.79	.39	7.99	.59	.19	.78	.38	5.9	1.7	7.6	3.4	79.3
47	.591	.18	.77	.36	.95	.54	.14	.73	.32	5.4	0.9	6.3	1.8	7.2
48	.584	.17	.75	.34	.92	.50	.09	.67	.25	5.0	50.1	5.1	700.1	5.1
49	.577	.15	.73	.31	.89	.46	7.04	.61	.19	4.6	49.2	3.8	698.4	3.0
50 50	19.570	39.14	58.71	78.28	97.85	117.42	136.99	156.56	176.13	1174.2	2348.4	3522.6	4696.7	5870.9
51	.563	.13	.69	.25	.82	.38	.94	.50	.07	3.8	7.6	1.3	5.1	68.8
52	.556	.11	.67	.22	.78	.33	.89	.45	6.00	3.3	6.7	20.0	3.4	6.7
53	.549	.10	.65	.20	.75	.29	.84	.39	5.94	2.9	5.9	18.8	1.7	4.6
54	.542	.08	.63	.17	.71	.25	.79	.33	.88	2.5	5.0	7.5	90.0	2.6
50 55	19.535	39.07	58.60	78.14	97.68	117.21	136.75	156.28	175.81	1172.1	2344.2	3516.3	4688.4	5860.5
56	.528	.06	.58	.11	.64	.17	.70	.22	.75	1.7	3.4	5.0	6.7	58.4
57	.521	.04	.56	.08	.61	.13	.65	.17	.69	1.3	2.5	3.8	5.0	6.3
58	.514	.03	.54	.06	.57	.08	.60	.11	.63	0.8	1.7	2.5	3.3	4.2
59	.507	.01	.52	.03	.54	.04	.55	.06	.56	0.4	0.8	1.3	1.7	2.1
50 60	19.500	39.00	58.50	78.00	97.50	117.00	136.50	156.00	175.50	1170.0	2340.0	3510.0	4680.0	5850.0

Lat.	Latitude 50° to 51°—Meridional arcs.						Latitude 50°—Co-ordinates of curvature.		
	Value of 1″	Sums of seconds for middle latitude 50° 30′		Value of 1′	Continuous sums of minutes from latitude 50° 00′		Longitude.	X	Y
° ′	*Meters.*	″	*Meters.*	*Meters.*	′	*Meters.*	° ′	*Meters.*	*Meters.*
50 00	30.897			1853.82					
1	7	1	30.90	.83	1	1 853.8	0 1	1 195.0	0.1
2	7	2	61.80	.83	2	3 707.7	2	2 389.9	0.5
3	7	3	92.70	.84	3	5 561.5	3	3 584.9	1.2
4	7	4	123.60	.84	4	7 415.3	4	4 779.9	2.1
50 05	30.897	5	154.50	1853.85	5	9 269.2	0 5	5 974.8	3.3
6	8	6	185.40	.85	6	11 123.0	6	7 169.8	4.8
7	8	7	216.30	.86	7	12 976.9	7	8 364.8	6.5
8	8	8	247.20	.86	8	14 830.7	8	9 559.7	8.5
9	8	9	278.10	.87	9	16 684.6	9	10 754.7	10.8
50 10	30.898	10	309.00	1853.88	10	18 538.5	0 10	11 949.7	13.3
11	8	1	.339.90	.88	1	20 392.4	15	17 924.5	30.0
12	8	2	370.80	.89	2	22 246.2	20	23 899.3	53.3
13	8	3	401.70	.89	3	24 100.1	25	29 874.1	83.2
14	8	4	432.60	.90	4	25 954.0	30	35 848.8	119.8
50 15	30.898	15	463.50	1853.90	15	27 807.9	0 35	41 823.5	163.1
16	8	6	494.40	.91	6	29 661.8	40	47 798.1	213.0
17	9	7	525.30	.91	7	31 515.7	45	53 772.7	269.6
18	9	8	556.19	.92	8	33 369.7	50	59 747.2	332.8
19	9	9	587.09	.92	9	35 223.6	55	65 721.6	402.8
50 20	30.899	20	617.99	1853.93	20	37 077.5	1 00	71 696.0	479.3
21	9	1	648.89	.93	1	38 931.4	05	77 670.2	562.5
22	9	2	679.79	.94	2	40 785.4	10	83 644.4	652.4
23	9	3	710.69	.95	3	42 639.3	15	89 618.5	748.9
24	9	4	741.59	.95	4	44 493.3	20	95 592.4	852.1
50 25	30.899	25	772.49	1853.96	25	46 347.2	1 25	101 566.2	961.9
26	9	6	803.39	.96	6	48 201.2	30	107 540.0	1 078.4
27	899	7	834.29	.97	7	50 055.2	35	113 513.5	1 201.5
28	900	8	865.19	.97	8	51 909.1	40	119 486.9	1 331.3
29	0	9	896.09	.98	9	53 763.1	45	125 460.2	1 467.8
50 30	30.900	30	926.99	1853.98	30	55 617.1	1 50	131 433.3	1 610.9
31	0	1	957.89	.99	1	57 471.0	55	137 406.3	1 760.7
32	0	2	988.79	3.99	2	59 325.0	2 00	143 379	1 917
33	0	3	1 019.69	4.00	3	61 179.0	3 00	215 037	4 313
34	0	4	1 050.59	.00	4	63 033.0	4 00	286 656	7 667
50 35	30.900	35	1 081.49	1854.01	35	64 887.0	5 00	358 224	11 978
36	0	6	1 112.39	.02	6	66 741.1	6 00	429 727	17 246
37	0	7	1 143.29	.02	7	68 595.1	7 00	501 154	23 469
38	0	8	1 174.19	.03	8	70 449.1	8 00	572 492	30 646
39	1	9	1 205.09	.03	9	72 303.2	9 00	643 727	38 777
50 40	30.901	40	1 235.99	1854.04	40	74 157.2	10 00	714 847	47 859
41	1	1	1 266.89	.04	1	76 011.2	11 00	785 839	57 891
42	1	2	1 297.79	.05	2	77 865.2	12 00	856 691	68 872
43	1	3	1 328.69	.05	3	79 719.3	13 00	927 389	80 798
44	1	4	1 359.59	.06	4	81 573.4	14 00	997 922	93 669
50 45	30.901	45	1 390.49	1854.06	45	83 427.4	15 00	1 068 277	107 482
46	1	6	1 421.39	.07	6	85 281.5	16 00	1 138 440	122 234
47	1	7	1 452.29	.07	7	87 135.6	17 00	1 208 400	137 923
48	1	8	1 483.19	.08	8	88 989.6	18 00	1 278 144	154 546
49	1	9	1 514.09	.09	9	90 843.7	19 00	1 347 660	172 099
50 50	30.902	50	1 544.99	1854.09	50	92 697.8	20 00	1 416 934	190 581
51	2	1	1 575.89	.10	1	94 551.9	21 00	1 485 956	209 987
52	2	2	1 606.79	.10	2	96 406.0	22 00	1 554 711	230 314
53	2	3	1 637.69	.11	3	98 260.1	23 00	1 623 189	251 559
54	2	4	1 668.58	.11	4	100 114.2	24 00	1 691 377	273 717
50 55	30.902	55	1 699.48	1854.12	55	101 968.4	25 00	1 759 262	296 785
56	2	6	1 730.38	.12	6	103 822.5	26 00	1 826 833	320 758
57	2	7	1 761.28	.13	7	105 676.6	27 00	1 894 077	345 633
58	2	8	1 792.18	.13	8	107 530.7	28 00	1 960 983	371 404
59	2	9	1 823.08	.14	9	109 384.9	29 00	2 027 538	398 068
50 60	30.902	60	1 853.98	1854.14	60	111 239.0	30 00	2 093 731	425 619

Latitude 51° to 52°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
51 00	19.500	39.00	58.50	78.00	97.50	117.00	136.50	156.00	175.50	1170.0	2340.0	3510.0	4680.0	5850.0
1	.493	8.99	.48	7.97	.47	6.96	.45	5.94	.44	69.6	39.2	08.7	78.3	47.9
2	.486	.97	.46	.94	.43	.92	.40	.89	.37	9.2	8.3	7.5	6.6	5.8
3	.479	.96	.44	.92	.40	.87	.35	.83	.31	8.7	7.5	6.2	5.0	3.7
4	.472	.94	.42	.89	.36	.83	.30	.78	.25	8.3	6.6	5.0	3.3	41.6
51 05	19.465	38.93	58.39	77.86	97.33	116.79	136.26	155.72	175.18	1167.9	2335.8	3503.7	4671.6	5839.5
6	.458	.92	.37	.83	.29	.75	.21	.66	.12	7.5	5.0	2.4	69.9	7.4
7	.451	.90	.35	.80	.26	.71	.16	.61	.06	7.1	4.1	501.2	8.2	5.3
8	.444	.89	.33	.78	.22	.66	.11	.55	5.00	6.6	3.3	499.9	6.6	3.2
9	.437	.87	.31	.75	.19	.62	.06	.50	4.93	6.2	2.4	8.7	4.9	31.1
51 10	19.430	38.86	58.29	77.72	97.15	116.58	136.01	155.44	174.87	1165.8	2331.6	3497.4	4663.2	5829.0
11	.423	.85	.27	.69	.12	.54	5.96	.38	.81	5.4	30.8	6.1	61.5	6.9
12	.416	.83	.25	.66	.08	.50	.91	.33	.74	5.0	29.9	4.9	59.8	4.8
13	.409	.82	.23	.64	.05	.45	.86	.27	.68	4.5	9.1	3.6	8.2	2.7
14	.402	.80	.21	.61	7.01	.41	.81	.22	.62	4.1	8.2	2.4	6.5	20.6
51 15	19.395	38.79	58.18	77.58	96.98	116.37	135.77	155.16	174.55	1163.7	2327.4	3491.1	4654.8	5818.5
16	.388	.78	.16	.55	.94	.33	.72	.10	.49	3.3	6.6	89.8	3.1	6.4
17	.381	.76	.14	.52	.91	.29	.67	5.05	.43	2.9	5.7	8.6	51.4	4.3
18	.374	.75	.12	.50	.87	.24	.62	4.99	.37	2.4	4.9	7.3	49.7	2.2
19	.367	.73	.10	.47	.84	.20	.57	.94	.30	2.0	4.0	6.0	8.1	10.1
51 20	19.360	38.72	58.08	77.44	96.80	116.16	135.52	154.88	174.24	1161.6	2323.2	3484.8	4646.4	5808.0
21	.353	.71	.06	.41	.77	.12	.47	.82	.18	1.2	2.4	3.5	4.7	5.9
22	.346	.69	.04	.38	.73	.08	.42	.77	.11	0.8	1.5	2.3	3.0	3.8
23	.339	.68	.02	.36	.70	6.03	.37	.71	4.05	60.3	20.7	81.0	41.3	801.7
24	.332	.66	8.00	.33	.66	5.99	.32	.65	3.99	59.9	19.8	79.7	39.6	799.5
51 25	19.325	38.65	57.97	77.30	96.63	115.95	135.28	154.60	173.92	1159.5	2319.0	3478.5	4638.0	5797.4
26	.318	.64	.95	.27	.59	.91	.23	.54	.86	9.1	8.2	7.2	6.3	5.3
27	.311	.62	.93	.24	.55	.86	.18	.49	.80	8.6	7.3	5.9	4.6	3.2
28	.304	.61	.91	.22	.52	.82	.13	.43	.74	8.2	6.5	4.7	2.9	91.1
29	.297	.59	.89	.19	.49	.78	.08	.37	.67	7.8	5.6	3.4	31.2	89.0
51 30	19.290	38.58	57.87	77.16	96.45	115.74	135.03	154.32	173.61	1157.4	2314.8	3472.1	4629.5	5786.9
31	.283	.57	.85	.13	.42	.70	4.98	.26	.55	7.0	3.9	70.9	7.8	4.8
32	.276	.55	.83	.10	.38	.65	.93	.20	.48	6.5	3.1	69.6	6.1	2.7
33	.269	.54	.81	.07	.35	.61	.88	.15	.42	6.1	2.2	8.3	4.4	80.6
34	.261	.52	.78	.05	.31	.57	.83	.09	.35	5.7	1.4	7.1	2.8	78.4
51 35	19.254	38.51	57.76	77.02	96.28	115.55	134.78	154.04	173.29	1155.3	2310.5	3465.8	4621.1	5776.3
36	.247	.49	.74	6.99	.24	.48	.73	3.98	.23	4.8	09.7	4.5	19.4	4.2
37	.240	.48	.72	.96	.21	.44	.68	.92	.16	4.4	8.8	3.3	7.7	2.1
38	.233	.47	.70	.93	.17	.40	.63	.87	.10	4.0	8.0	2.0	6.0	70.0
39	.226	.45	.68	.90	.14	.36	.58	.81	3.03	3.6	7.1	60.7	4.3	67.9
51 40	19.219	38.44	57.66	76.88	96.10	115.32	134.53	153.75	172.97	1153.2	2306.3	3459.5	4612.6	5765.8
41	.212	.42	.64	.85	.06	.27	.48	.70	.91	2.7	5.5	8.2	10.9	3.7
42	.205	.41	.62	.82	6.03	.23	.43	.64	.84	2.3	4.6	6.9	09.2	61.5
43	.198	.40	.59	.79	5.99	.19	.38	.58	.78	1.9	3.8	5.6	7.5	59.4
44	.191	.38	.57	.76	.96	.15	.33	.53	.72	1.5	2.9	4.4	5.8	7.3
51 45	19.184	38.37	57.55	76.74	95.92	115.10	134.29	153.47	172.65	1151.0	2302.1	3453.1	4604.1	5755.2
46	.177	.35	.53	.71	.88	.06	.24	.41	.59	0.6	1.2	1.8	2.4	3.1
47	.170	.34	.51	.68	.85	5.02	.19	.36	.53	50.2	300.4	50.6	600.8	50.9
48	.163	.33	.49	.65	.81	4.98	.14	.30	.47	49.8	299.5	49.3	599.1	48.8
49	.156	.31	.47	.62	.78	.93	.09	.25	.40	9.3	8.7	8.0	7.4	6.7
51 50	19.149	38.30	57.45	76.59	95.74	114.89	134.04	153.19	172.34	1148.9	2297.8	3446.8	4595.7	5744.6
51	.142	.28	.43	.57	.71	.85	3.99	.13	.28	8.5	7.0	5.5	4.0	2.5
52	.134	.27	.40	.54	.67	.81	.94	.08	.21	8.1	6.1	4.2	2.3	40.3
53	.127	.25	.38	.51	.64	.76	.89	3.02	.15	7.6	5.3	2.9	90.6	38.2
54	.120	.24	.36	.48	.60	.72	.84	2.96	.08	7.2	4.4	1.7	88.9	6.1
51 55	19.113	38.23	57.34	76.45	95.57	114.68	133.80	152.91	172.02	1146.8	2293.6	3440.4	4587.2	5734.0
56	.106	.21	.32	.42	.53	.64	.75	.85	1.96	6.4	2.7	39.1	5.5	31.8
57	.099	.20	.30	.40	.50	.59	.70	.79	.89	5.9	1.9	7.8	3.8	29.7
58	.092	.18	.28	.37	.46	.55	.65	.74	.83	5.5	1.0	6.6	2.1	7.6
59	.085	.17	.25	.34	.43	.51	.60	.68	.76	5.1	90.2	5.3	80.4	5.5
51 60	19.078	38.16	57.23	76.31	95.39	114.47	133.55	152.62	171.70	1144.7	2289.3	3434.0	4578.7	5723.4

Lat.		Latitude 51° to 52°—Meridional arcs.						Latitude 51°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 51° 30′		Value of 1′	Continuous sums of minutes from latitude 51° 00′		Longitude.	X	Y
°	′	Meters.	″	Meters.	Meters.	′	Meters.	° ′	Meters.	Meters.
51	00	30.902			1854.14					
	1	3	1	30.91	.15	1	1 854.1	0 1	1 170.0	0.1
	2	3	2	61.81	.16	2	3 708.3	2	2 340.0	0.5
	3	3	3	92.72	.16	3	5 562.5	3	3 510.0	1.2
	4	3	4	123.62	.17	4	7 416.6	4	4 680.0	2.1
51	05	30.903	5	154.53	1854.17	5	9 270.8	0 5	5 850.0	3.3
	6	3	6	185.43	.18	6	11 125.0	6	7 020.0	4.8
	7	3	7	216.34	.18	7	12 979.1	7	8 190.0	6.5
	8	3	8	247.24	.19	8	14 833.3	8	9 360.0	8.5
	9	3	9	278.15	.19	9	16 687.5	9	10 530.0	10.7
51	10	30.903	10	309.05	1854.20	10	18 541.7	0 10	11 700.0	13.2
	11	3	1	339.96	.20	1	20 395.9	15	17 550.0	29.8
	12	3	2	370.86	.21	2	22 250.1	20	23 399.9	52.9
	13	4	3	401.77	.21	3	24 104.3	25	29 249.9	82.7
	14	4	4	432.67	.22	4	25 958.6	30	35 099.7	119.0
51	15	30.904	15	463.58	1854.23	15	27 812.8	0 35	40 949.6	162.0
	16	4	6	494.48	.23	6	29 667.0	40	46 799.4	211.6
	17	4	7	525.39	.24	7	31 521.2	45	52 649.1	267.8
	18	4	8	556.29	.24	8	33 375.5	50	58 498.8	330.6
	19	4	9	587.20	.25	9	35 229.7	55	64 348.4	400.0
51	20	30.904	20	618.10	1854.25	20	37 084.0	1 00	70 197.9	476.1
	21	4	1	649.01	.26	1	38 938.2	05	76 047.3	558.7
	22	4	2	679.91	.26	2	40 792.5	10	81 896.6	648.0
	23	4	3	710.82	.27	3	42 646.8	15	87 745.8	743.9
	24	5	4	741.72	.27	4	44 501.0	20	93 594.9	846.4
51	25	30.905	25	772.63	1854.28	25	46 355.3	1 25	99 443.9	955.5
	26	5	6	803.53	.28	6	48 209.6	30	105 292.8	1 071.2
	27	5	7	834.44	.29	7	50 063.9	35	111 141.5	1 193.5
	28	5	8	865.34	.29	8	51 918.2	40	116 990.1	1 322.4
	29	5	9	896.25	.30	9	53 772.5	45	122 838.5	1 458.0
51	30	30.905	30	927.15	1854.31	30	55 626.8	1 50	128 686.8	1 600.1
	31	5	1	958.06	.31	1	57 481.1	55	134 534.9	1 748.9
	32	5	2	988.96	.32	2	59 335.4	2 00	140 383	1 904
	33	5	3	1 019.87	.32	3	61 189.7	3 00	210 542	4 284
	34	5	4	1 050.77	.33	4	63 044.0	4 00	280 662	7 616
51	35	30.906	35	1 081.68	1854.33	35	64 898.4	5 00	350 731	11 898
	36	6	6	1 112.58	.34	6	66 752.7	6 00	420 735	17 130
	37	6	7	1 143.49	.34	7	68 607.0	7 00	490 662	23 311
	38	6	8	1 174.39	.35	8	70 461.4	8 00	560 499	30 440
	39	6	9	1 205.30	.35	9	72 315.7	9 00	630 232	38 515
51	40	30.906	40	1 236.20	1854.36	40	74 170.1	10 00	699 850	47 536
	41	6	1	1 267.11	.36	1	76 024.5	11 00	769 338	57 500
	42	6	2	1 298.01	.37	2	77 878.8	12 00	838 686	68 405
	43	6	3	1 328.92	.38	3	79 733.2	13 00	907 879	80 251
	44	6	4	1 359.82	.38	4	81 587.6	14 00	976 904	93 033
51	45	30.906	45	1 390.73	1854.39	45	83 442.0	15 00	1 045 751	106 751
	46	7	6	1 421.63	.39	6	85 296.3	16 00	1 114 404	121 401
	47	7	7	1 452.54	.40	7	87 150.7	17 00	1 182 853	136 981
	48	7	8	1 483.44	.40	8	89 005.1	18 00	1 251 084	153 488
	49	7	9	1 514.35	.41	9	90 859.5	19 00	1 319 085	170 919
51	50	30.907	50	1 545.25	1854.41	50	92 713.9	20 00	1 386 844	189 270
	51	7	1	1 576.16	.42	1	94 568.4	21 00	1 454 347	208 539
	52	7	2	1 607.06	.42	2	96 422.8	22 00	1 521 582	228 722
	53	7	3	1 637.97	.43	3	98 277.2	23 00	1 588 538	249 815
	54	7	4	1 668.88	.43	4	100 131.6	24 00	1 655 201	271 814
51	55	30.907	55	1 699.78	1854.44	55	101 986.1	25 00	1 721 561	294 715
	56	7	6	1 730.69	.44	6	103 840.5	26 00	1 787 603	318 514
	57	8	7	1 761.59	.45	7	105 695.0	27 00	1 853 316	343 206
	58	8	8	1 792.50	.46	8	107 549.4	28 00	1 918 688	368 788
	59	8	9	1 823.40	.46	9	109 403.9	29 00	1 983 708	395 254
51	60	30.908	60	1 854.31	1854.47	60	111 258.3	30 00	2 048 362	422 600

Latitude 52° to 53°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
52 00	19.078	38.16	57.23	76.31	95.39	114.47	133.55	152.62	171.70	1144.7	2289.3	3434.0	4578.7	5723.4
1	.071	.14	.21	.28	.36	.42	.50	.57	.64	4.2	8.5	2.7	7.0	21.2
2	.064	.13	.19	.25	.32	.38	.45	.51	.57	3.8	7.6	1.5	5.3	19.1
3	.057	.11	.17	.23	.29	.34	.40	.45	.51	3.4	6.8	30.2	3.6	7.0
4	.049	.10	.15	.20	.25	.30	.35	.40	.44	3.0	5.9	28.9	1.9	4.8
52 05	19.042	38.08	57.13	76.17	95.22	114.25	133.30	152.34	171.38	1142.5	2285.1	3427.6	4570.2	5712.7
6	.035	.07	.11	.14	.18	.21	.25	.28	.32	2.1	4.2	6.4	68.5	10.6
7	.028	.06	.08	.11	.14	.17	.20	.23	.25	1.7	3.4	5.1	6.8	08.5
8	.021	.04	.06	.08	.11	.13	.15	.17	.19	1.3	2.5	3.8	5.1	6.3
9	.014	.03	.04	.06	.07	.08	.10	.11	.12	0.8	1.7	2.5	3.4	4.2
52 10	19.007	38.01	57.02	76.03	95.04	114.04	133.05	152.06	171.06	1140.4	2280.8	3421.3	4561.7	5702.1
11	9.000	8.00	7.00	6.00	5.00	4.00	3.00	2.00	1.00	40.0	80.0	20.0	60.0	699.9
12	8.993	7.99	6.98	5.97	4.97	3.96	2.95	1.94	0.93	39.6	79.1	18.7	58.3	7.8
13	.986	.97	.96	.94	.93	.91	.90	.88	.87	9.1	8.3	7.4	6.5	5.7
14	.979	.96	.94	.91	.90	.87	.85	.83	.81	8.7	7.4	6.1	4.8	3.6
52 15	18.971	37.94	56.91	75.89	94.86	113.83	132.80	151.77	170.74	1138.3	2276.6	3414.9	4553.1	5691.4
16	.964	.93	.89	.86	.82	.79	.75	.71	.68	7.9	5.7	3.6	51.4	89.3
17	.957	.92	.87	.83	.79	.74	.70	.66	.61	7.4	4.9	2.3	49.7	7.2
18	.950	.90	.85	.80	.75	.70	.65	.60	.55	7.0	4.0	11.0	8.0	5.0
19	.943	.89	.83	.77	.72	.66	.60	.54	.48	6.6	3.2	09.7	6.3	2.9
52 20	18.936	37.87	56.81	75.74	94.68	113.62	132.55	151.49	170.42	1136.2	2272.3	3408.5	4544.6	5680.8
21	.929	.86	.79	.71	.64	.57	.50	.43	.36	5.7	1.4	7.2	2.9	78.6
22	.922	.84	.77	.69	.61	.53	.45	.37	.29	5.3	70.6	5.9	41.2	6.5
23	.914	.83	.74	.66	.57	.49	.40	.32	.23	4.9	69.7	4.6	39.5	4.3
24	.907	.81	.72	.63	.54	.44	.35	.26	.16	4.4	8.9	3.3	7.8	2.2
52 25	18.900	37.80	56.70	75.60	94.50	113.40	132.30	151.20	170.10	1134.0	2268.0	3402.0	4536.0	5670.1
26	.893	.79	.68	.57	.46	.36	.25	.14	70.04	3.6	7.2	400.8	4.3	67.9
27	.886	.77	.66	.54	.43	.32	.20	.09	69.97	3.2	6.3	399.5	2.6	5.8
28	.879	.76	.64	.52	.39	.27	.15	1.03	.91	2.7	5.5	8.2	30.9	3.7
29	.872	.74	.61	.49	.36	.23	.10	0.97	.84	2.3	4.6	6.9	29.2	61.5
52 30	18.865	37.73	56.59	75.46	94.32	113.19	132.05	150.92	169.78	1131.9	2263.8	3395.6	4527.5	5659.4
31	.857	.71	.57	.43	.29	.14	2.00	.86	.72	1.4	2.9	4.3	5.8	7.2
32	.850	.70	.55	.40	.25	.10	1.95	.80	.65	1.0	2.1	3.1	4.1	5.1
33	.843	.69	.53	.37	.22	.06	.90	.75	.59	0.6	1.2	1.8	2.4	2.9
34	.836	.67	.51	.35	.18	3.02	.85	.69	.52	30.2	60.3	90.5	20.6	50.8
52 35	18.829	37.66	56.49	75.32	94.15	112.97	131.80	150.63	169.46	1129.7	2259.5	3389.2	4518.9	5648.7
36	.822	.64	.46	.29	.11	.93	.75	.57	.40	9.3	8.6	7.9	7.2	6.5
37	.815	.63	.44	.26	.08	.89	.70	.52	.33	8.9	7.8	6.6	5.5	4.4
38	.807	.61	.42	.23	.04	.84	.65	.46	.27	8.4	6.9	5.3	3.8	2.2
39	.800	.60	.40	.20	4.01	.80	.60	.40	.20	8.0	6.1	4.1	2.1	40.1
52 40	18.793	37.59	56.38	75.17	93.97	112.76	131.55	150.35	169.14	1127.6	2255.2	3382.8	4510.4	5638.0
41	.786	.57	.36	.14	.93	.72	.50	.29	.08	7.2	4.3	1.5	508.6	5.8
42	.779	.56	.34	.12	.90	.67	.45	.23	9.01	6.7	3.5	80.2	6.9	3.7
43	.772	.54	.31	.09	.86	.63	.40	.17	8.95	6.3	2.6	78.9	5.2	31.5
44	.765	.53	.29	.06	.83	.59	.35	.12	.88	5.9	1.8	7.6	3.5	29.4
52 45	18.757	37.51	56.27	75.03	93.79	112.54	131.30	150.06	168.82	1125.4	2250.9	3376.3	4501.8	5627.2
46	.750	.50	.25	5.00	.75	.50	.25	50.00	.75	5.0	50.0	5.0	500.1	5.1
47	.743	.49	.23	4.97	.72	.46	.20	49.94	.69	4.6	49.2	3.8	498.3	2.9
48	.736	.47	.21	.94	.68	.42	.15	.89	.62	4.2	8.3	2.5	6.6	20.8
49	.729	.46	.19	.92	.65	.37	.10	.83	.56	3.7	7.5	71.2	4.9	18.6
52 50	18.722	37.44	56.16	74.89	93.61	112.33	131.05	149.77	168.49	1123.3	2246.6	3369.9	4493.2	5616.5
51	.714	.43	.14	.86	.57	.29	0.00	.72	.43	2.9	5.7	8.6	91.6	4.3
52	.707	.41	.12	.83	.54	.24	.95	.66	.36	2.4	4.9	7.3	89.7	2.2
53	.700	.40	.10	.80	.50	.20	.90	.60	.30	2.0	4.0	6.0	8.0	10.0
54	.693	.39	.08	.77	.47	.16	.85	.54	.23	1.6	3.2	4.7	6.3	07.9
52 55	18.686	37.37	56.06	74.74	93.43	112.11	130.80	149.49	168.17	1121.1	2242.3	3363.4	4484.6	5605.7
56	.678	.36	.03	.71	.39	.07	.75	.43	.10	0.7	1.4	2.1	2.9	3.4
57	.671	.34	6.01	.69	.36	2.03	.70	.37	8.04	20.3	40.6	60.9	81.1	601.4
58	.664	.33	5.99	.66	.32	1.99	.65	.31	7.98	19.9	39.7	59.6	79.4	599.3
59	.657	.31	.97	.63	.29	.94	.60	.26	.91	9.4	8.9	8.3	7.7	7.1
52 60	18.650	37.30	55.95	74.60	93.25	111.90	130.55	149.20	167.85	1119.0	2238.0	3357.0	4476.0	5595.0

Lat.		Latitude 52° to 53°—Meridional arcs.						Latitude 52°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 52° 30′		Value of 1′	Continuous sums of minutes from latitude 52° 00′		Longitude.	X.	Y
°	′	Meters.	″	Meters.	Meters.	′	Meters.	° ′	Meters.	Meters.
52	00	30.908			1854.47					
	1	8	1	30.91	.47	1	1 854.5	0 1	1 144.7	0.1
	2	8	2	61.82	.48	2	3 708.9	2	2 289.3	0.5
	3	8	3	92.73	.48	3	5 563.4	3	3 434.0	1.2
	4	8	4	123.64	.49	4	7 417.9	4	4 578.7	2.1
52	05	30.908	5	154.55	1854.49	5	9 272.4	0 5	5 723.4	3.3
	6	8	6	185.46	.50	6	11 126.9	6	6 868.0	4.7
	7	8	7	216.37	.50	7	12 981.4	7	8 012.7	6.4
	8	8	8	247.28	.51	8	14 835.9	8	9 157.4	8.4
	9	9	9	278.19	.51	9	16 690.4	9	10 302.0	10.6
52	10	30.909	10	309.10	1854.52	10	18 544.9	0 10	11 446.7	13.1
	11	9	1	340.01	.52	1	20 399.4	15	17 170.0	29.5
	12	9	2	370.93	.53	2	22 254.0	20	22 893.4	52.5
	13	9	3	401.84	.54	3	24 108.5	25	28 616.6	82.0
	14	9	4	432.75	.54	4	25 963.0	30	34 339.9	118.1
52	15	30.909	15	463.66	1854.55	15	27 817.6	0 35	40 063.1	160.7
	16	9	6	494.57	.55	6	29 672.1	40	45 786.3	209.9
	17	9	7	525.48	.56	7	31 526.7	45	51 509.4	265.7
	18	9	8	556.39	.56	8	33 381.3	50	57 232.4	328.0
	19	9	9	587.30	.57	9	35 235.8	55	62 955.3	396.9
52	20	30.910	20	618.21	1854.57	20	37 090.4	1 00	68 678.2	472.3
	21	0	1	649.12	.58	1	38 945.0	05	74 401.0	554.3
	22	0	2	680.03	.58	2	40 799.6	10	80 123.6	642.8
	23	0	3	710.94	.59	3	42 654.1	15	85 846.2	737.9
	24	0	4	741.85	.59	4	44 508.7	20	91 568.7	839.6
52	25	30.910	25	772.76	1854.60	25	46 363.3	1 25	97 291.0	947.8
	26	0	6	803.67	.60	6	48 217.9	30	103 013.2	1 062.6
	27	0	7	834.58	.61	7	50 072.5	35	108 735.3	1 184.0
	28	0	8	865.49	.62	8	51 927.2	40	114 457.2	1 311.9
	29	0	9	896.40	.62	9	53 781.8	45	120 179.0	1 446.3
52	30	30.910	30	927.31	1854.63	30	55 636.4	1 50	125 900.7	1 587.4
	31	1	1	958.22	.63	1	57 491.0	55	131 622.1	1 735.0
	32	1	2	989.13	.64	2	59 345.7	2 00	137 343	1 889
	33	1	3	1 020.04	.64	3	61 200.3	3 00	205 982	4 250
	34	1	4	1 050.95	.65	4	63 054.9	4 00	274 583	7 555
52	35	30.911	35	1 081.87	1854.65	35	64 909.6	5 00	343 131	11 803
	36	1	6	1 112.78	.66	6	66 764.2	6 00	411 615	16 993
	37	1	7	1 143.69	.66	7	68 618.9	7 00	480 020	23 124
	38	1	8	1 174.60	.67	8	70 473.6	8 00	548 335	30 196
	39	1	9	1 205.51	.67	9	72 328.2	9 00	616 546	38 207
52	40	30.911	40	1 236.42	1854.68	40	74 182.9	10 00	684 640	47 155
	41	1	1	1 267.33	.68	1	76 037.6	11 00	752 605	57 039
	42	1	2	1 298.24	.69	2	77 892.3	12 00	820 428	67 856
	43	2	3	1 329.15	.69	3	79 747.0	13 00	888 095	79 605
	44	2	4	1 360.06	.70	4	81 601.7	14 00	955 595	92 284
52	45	30.912	45	1 390.97	1854.71	45	83 456.4	15 00	1 022 913	105 890
	46	2	6	1 421.88	.71	6	85 311.1	16 00	1 090 038	120 420
	47	2	7	1 452.79	.72	7	87 165.8	17 00	1 156 957	135 872
	48	2	8	1 483.70	.72	8	89 020.5	18 00	1 223 658	152 243
	49	2	9	1 514.61	.73	9	90 875.3	19 00	1 290 126	169 530
52	50	30.912	50	1 545.52	1854.73	50	92 730.0	20 00	1 356 351	187 729
	51	2	1	1 576.43	.74	1	94 584.7	21 00	1 422 319	206 838
	52	2	2	1 607.34	.74	2	96 439.5	22 00	1 488 018	226 852
	53	2	3	1 638.25	.75	3	98 294.2	23 00	1 553 436	247 767
	54	3	4	1 669.16	.75	4	100 149.0	24 00	1 618 559	269 580
52	55	30.913	55	1 700.07	1854.76	55	102 003.7	25 00	1 683 377	292 287
	56	3	6	1 730.98	.76	6	103 858.5	26 00	1 747 876	315 883
	57	3	7	1 761.89	.77	7	105 713.3	27 00	1 812 045	340 364
	58	3	8	1 792.81	.77	8	107 568.0	28 00	1 875 870	365 725
	59	3	9	1 823.72	.78	9	109 422.8	29 00	1 939 342	391 961
52	60	30.913	60	1 854.63	1854.78	60	111 277.6	30 00	2 002 446	419 068

Latitude 53° to 54°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
53 00	18.650	37.30	55.95	74.60	93.25	111.90	130.55	149.20	167.85	1119.0	2238.0	3357.0	4476.0	5595.0
1	.643	.29	.93	.57	.21	.86	.50	.14	.79	8.6	7.1	5.7	4.2	2.8
2	.635	.27	.91	.54	.18	.81	.45	.08	.72	8.1	6.3	4.4	2.5	90.6
3	.628	.26	.88	.51	.14	.77	.40	9.03	.66	7.7	5.4	3.1	70.8	88.5
4	.621	.24	.86	.49	.11	.73	.35	8.97	.59	7.3	4.6	1.8	69.1	6.3
53 05	18.614	37.23	55.84	74.46	93.07	111.68	130.30	148.91	167.53	1116.8	2233.7	3350.5	4467.3	5584.2
6	.607	.21	.82	.43	.03	.64	.25	.85	.46	6.4	2.8	49.2	5.6	82.0
7	.600	.20	.80	.40	3.00	.60	.20	.80	.40	6.0	2.0	7.9	3.9	79.9
8	.592	.18	.78	.37	2.96	.55	.15	.74	.33	5.5	1.1	6.6	2.2	7.7
9	.585	.17	.75	.34	.93	.51	.10	.68	.27	5.1	30.2	5.3	60.4	5.5
53 10	18.578	37.16	55.73	74.31	92.89	111.47	130.05	148.62	167.20	1114.7	2229.4	3344.0	4458.7	5573.4
11	.571	.14	.71	.28	.85	.42	30.00	.57	.14	4.2	8.5	2.7	7.0	71.2
12	.564	.13	.69	.25	.82	.38	29.95	.51	.07	3.8	7.6	1.4	5.2	69.1
13	.556	.11	.67	.23	.78	.34	.90	.45	7.01	3.4	6.8	40.1	3.5	6.9
14	.549	.10	.65	.20	.75	.29	.85	.39	6.94	2.9	5.9	38.8	1.8	4.7
53 15	18.542	37.08	55.63	74.17	92.71	111.25	129.79	148.34	166.88	1112.5	2225.0	3337.5	4450.1	5562.6
16	.535	.07	.60	.14	.67	.21	.74	.28	.81	2.1	4.1	6.2	48.3	60.4
17	.528	.06	.58	.11	.64	.17	.69	.22	.75	1.7	3.3	5.0	6.6	58.3
18	.520	.04	.56	.08	.60	.12	.64	.16	.68	1.2	2.4	3.7	4.9	6.1
19	.513	.03	.54	.05	.57	.08	.59	.10	.62	0.8	1.6	2.4	3.1	3.9
53 20	18.506	37.01	55.52	74.02	92.53	111.04	129.54	148.05	166.55	1110.4	2220.7	3331.1	4441.4	5551.8
21	.499	7.00	.50	3.99	.49	0.99	.49	7.99	.49	09.9	19.8	29.8	39.7	49.6
22	.491	6.98	.47	.97	.46	.95	.44	.93	.42	9.5	9.0	8.5	8.0	7.4
23	.484	.97	.45	.94	.42	.91	.39	.87	.36	9.1	8.1	7.2	6.2	5.3
24	.477	.95	.43	.91	.39	.86	.34	.82	.29	8.6	7.3	5.9	4.5	3.1
53 25	18.470	36.94	55.41	73.88	92.35	110.82	129.29	147.76	166.23	1108.2	2216.4	3324.6	4432.8	5540.9
26	.463	.93	.39	.85	.31	.78	.24	.70	.16	7.8	5.5	3.3	31.0	38.8
27	.455	.91	.37	.82	.28	.73	.19	.64	.10	7.3	4.6	2.0	29.3	6.6
28	.448	.90	.34	.79	.24	.69	.14	.59	6.03	6.9	3.8	20.7	7.6	4.4
29	.441	.88	.32	.76	.21	.65	.09	.53	5.97	6.5	2.9	19.4	5.8	2.3
53 30	18.434	36.87	55.30	73.73	92.17	110.60	129.04	147.47	165.90	1106.0	2212.0	3318.1	4424.1	5530.1
31	.426	.85	.28	.70	.13	.56	8.99	.41	.84	5.6	1.2	6.8	2.3	27.9
32	.419	.84	.26	.68	.10	.52	.94	.35	.77	5.2	10.3	5.5	20.6	5.8
33	.412	.82	.24	.65	.06	.47	.89	.30	.71	4.7	09.4	4.2	18.9	3.6
34	.405	.81	.21	.62	2.03	.43	.84	.24	.64	4.3	8.6	2.9	7.1	21.4
53 35	18.398	36.80	55.19	73.59	91.99	110.39	128.78	147.18	165.58	1103.9	2207.7	3311.6	4415.4	5519.3
36	.390	.78	.17	.56	.95	.34	.73	.12	.51	3.4	6.8	10.2	3.7	7.1
37	.383	.77	.15	.53	.92	.30	.68	.06	.45	3.0	6.0	08.9	1.9	4.9
38	.376	.75	.13	.50	.88	.25	.63	7.01	.38	2.5	5.1	7.6	10.2	2.7
39	.369	.74	.11	.48	.85	.21	.58	6.95	.32	2.1	4.3	6.3	08.5	10.6
53 40	18.361	36.72	55.08	73.45	91.81	110.17	128.53	146.89	165.25	1101.7	2203.4	3305.0	4406.7	5508.4
41	.354	.71	.06	.42	.77	.12	.48	.83	.19	1.2	2.5	3.7	5.0	6.2
42	.347	.69	.04	.39	.74	.08	.43	.77	.12	0.8	1.6	2.4	3.2	4.0
43	.340	.68	.02	.36	.70	10.04	.38	.72	5.06	100.4	200.8	301.1	401.5	501.9
44	.332	.66	5.00	.33	.66	09.99	.33	.66	4.99	099.9	199.9	299.8	399.8	499.7
53 45	18.325	36.65	54.97	73.30	91.63	109.95	128.28	146.60	164.93	1099.5	2199.0	3298.5	4398.0	5497.5
46	.318	.64	.95	.27	.59	.91	.22	.54	.86	9.1	8.1	7.2	6.3	5.3
47	.311	.62	.93	.24	.55	.86	.17	.48	.80	8.6	7.3	5.9	4.5	3.2
48	.303	.61	.91	.21	.51	.82	.12	.43	.73	8.2	6.4	4.6	2.8	91.0
49	.296	.59	.89	.19	.48	.78	.07	.37	.67	7.8	5.6	3.3	1.1	88.8
53 50	18.289	36.58	54.87	73.16	91.44	109.73	128.02	146.31	164.60	1097.3	2194.7	3292.0	4389.3	5486.6
51	.282	.56	.85	.13	.40	.69	7.97	.25	.53	6.9	3.8	90.7	7.6	4.5
52	.274	.55	.82	.10	.37	.65	.92	.19	.47	6.5	2.9	89.4	5.8	2.3
53	.267	.53	.80	.07	.33	.60	.87	.14	.40	6.0	2.1	8.1	4.1	80.1
54	.260	.52	.78	.04	.30	.56	.82	.08	.34	5.6	1.2	6.7	2.3	77.9
53 55	18.252	36.50	54.76	73.01	91.26	109.51	127.76	146.02	164.27	1095.1	2190.3	3285.4	4380.6	5475.7
56	.245	.49	.74	2.98	.22	.47	.71	5.96	.21	4.7	89.4	4.1	78.8	3.6
57	.238	.48	.71	.95	.19	.43	.66	.90	.14	4.3	8.5	2.8	7.1	71.4
58	.231	.46	.69	.92	.15	.38	.61	.85	.07	3.8	7.7	1.5	5.4	69.2
59	.223	.45	.67	.89	.12	.34	.56	.79	4.01	3.4	6.8	80.2	3.6	7.0
53 60	18.216	36.43	54.65	72.86	91.08	109.30	127.51	145.73	163.94	1093.0	2185.9	3278.9	4371.9	5464.8

Lat.	Latitude 53° to 54°—Meridional arcs.						Latitude 53°—Co-ordinates of curvature.		
	Value of 1″	Sums of seconds for middle latitude 53° 30′		Value of 1′	Continuous sums of minutes from latitude 53° 00′		Longitude.	X	Y
° ′	*Meters.*	″	*Meters.*	*Meters.*	′	*Meters.*	° ′	*Meters.*	*Meters.*
53 00	30.913			1854.78					
1	3	1	30.92	.79	1	1 854.8	0 1	1 119.0	0.1
2	3	2	61.83	.80	2	3 709.6	2	2 238.0	0.5
3	3	3	92.75	.80	3	5 564.4	3	3 357.0	1.2
4	3	4	123.66	.81	4	7 419.2	4	4 476.0	2.1
53 05	30.914	5	154.58	1854.81	5	9 274.0	0 5	5 595.0	3.3
6	4	6	185.49	.82	6	11 128.8	6	6 714.0	4.7
7	4	7	216.41	.82	7	12 983.6	7	7 832.9	6.4
8	4	8	247.33	.83	8	14 838.5	8	8 951.9	8.3
9	4	9	278.24	.83	9	16 693.3	9	10 070.9	10.5
53 10	30.914	10	309.16	1854.84	10	18 548.1	0 10	11 189.9	13.0
11	4	1	340.07	.84	1	20 403.0	15	16 784.9	29.2
12	4	2	370.99	.85	2	22 257.8	20	22 379.8	52.0
13	4	3	401.90	.85	3	24 112.7	25	27 974.7	81.2
14	4	4	432.82	.86	4	25 967.5	30	33 569.5	117.0
53 15	30.914	15	463.74	1854.86	15	27 822.4	0 35	39 164.3	159.2
16	4	6	494.65	.87	6	29 677.2	40	44 759.1	208.0
17	5	7	525.57	.87	7	31 532.1	45	50 353.8	263.2
18	5	8	556.48	.88	8	33 387.0	50	55 948.4	325.0
19	5	9	587.40	.89	9	35 241.9	55	61 542.9	393.2
53 20	30.915	20	618.31	1854.89	20	37 096.8	1 00	67 137.4	467.9
21	5	1	649.23	.90	1	38 951.7	05	72 731.7	549.2
22	5	2	680.15	.90	2	40 806.6	10	78 326.0	636.9
23	5	3	711.06	.91	3	42 661.5	15	83 920.2	731.1
24	5	4	741.98	.91	4	44 516.4	20	89 514.2	831.8
53 25	30.915	25	772.89	1854.92	25	46 371.3	1 25	95 108.2	939.1
26	5	6	803.81	.92	6	48 226.2	30	100 702.0	1 052.8
27	5	7	834.72	.93	7	50 081.1	35	106 295.7	1 173.0
28	6	8	865.64	.93	8	51 936.1	40	111 889.2	1 299.7
29	6	9	896.56	.94	9	53 791.0	45	117 482.6	1 432.9
53 30	30.916	30	927.47	1854.94	30	55 645.9	1 50	123 075.8	1 572.6
31	6	1	958.39	.95	1	57 500.9	55	128 668.9	1 718.9
32	6	2	989.30	.95	2	59 355.8	2 00	134 262	1 872
33	6	3	1 020.22	.96	3	61 210.8	3 00	201 360	4 211
34	6	4	1 051.13	.96	4	63 065.8	4 00	268 419	7 485
53 35	30.916	35	1 082.05	1854.97	35	64 920.7	5 00	335 426	11 693
36	6	6	1 112.97	.97	6	66 775.7	6 00	402 368	16 835
37	6	7	1 143.88	.98	7	68 630.7	7 00	469 232	22 910
38	6	8	1 174.80	.99	8	70 485.6	8 00	536 004	29 916
39	7	9	1 205.71	4.99	9	72 340.6	9 00	602 672	37 852
53 40	30.917	40	1 236.63	1855.00	40	74 195.6	10 00	669 224	46 717
41	7	1	1 267.54	.00	1	76 050.6	11 00	735 645	56 508
42	7	2	1 298.46	.01	2	77 905.6	12 00	801 923	67 224
43	7	3	1 329.38	.01	3	79 760.6	13 00	868 046	78 863
44	7	4	1 360.29	.02	4	81 615.7	14 00	933 999	91 422
53 45	30.917	45	1 391.21	1855.02	45	83 470.7	15 00	999 772	104 900
46	7	6	1 422.12	.03	6	85 325.7	16 00	1 065 350	119 293
47	7	7	1 453.04	.03	7	87 180.7	17 00	1 130 721	134 598
48	7	8	1 483.95	.04	8	89 035.8	18 00	1 195 872	150 813
49	7	9	1 514.87	.04	9	90 890.8	19 00	1 260 791	167 935
53 50	30.917	50	1 545.79	1855.05	50	92 745.8	20 00	1 325 466	185 960
51	8	1	1 576.70	.05	1	94 600.9	21 00	1 389 882	204 885
52	8	2	1 607.62	.06	2	96 455.9	22 00	1 454 029	224 706
53	8	3	1 638.53	.06	3	98 311.0	23 00	1 517 893	245 418
54	8	4	1 669.45	.07	4	100 166.1	24 00	1 581 462	267 019
53 55	30.918	55	1 700.36	1855.07	55	102 021.1	25 00	1 644 724	289 504
56	8	6	1 731.28	.08	6	103 876.2	26 00	1 707 666	312 869
57	8	7	1 762.20	.08	7	105 731.3	27 00	1 770 277	337 109
58	8	8	1 793.11	.09	8	107 586.4	28 00	1 832 544	362 219
59	8	9	1 824.03	.10	9	109 441.5	20 00	1 894 455	388 194
53 60	30.918	60	1 854.94	1855.10	60	111 296.6	30 00	1 955 997	415 030

Latitude 54° to 55°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
54 00	18.216	36.43	54.65	72.86	91.08	109.30	127.51	145.73	163.94	1093.0	2185.9	3278.9	4371.9	5464.8
1	.209	.42	.63	.83	.04	.25	.46	.67	.88	2.5	5.0	7.6	70.1	2.7
2	.202	.40	.61	.81	1.01	.21	.41	.61	.81	2.1	4.2	6.3	68.4	60.5
3	.194	.39	.58	.78	0.97	.17	.36	.55	.75	1.7	3.3	5.0	6.6	58.3
4	.187	.37	.56	.75	.94	.12	.31	.50	.68	1.2	2.5	3.7	4.9	6.1
54 05	18.180	36.36	54.54	72.72	90.90	109.08	127.25	145.44	163.61	1090.8	2181.6	3272.3	4363.1	5453.9
6	.172	.34	.52	.69	.86	9.03	.20	.38	.55	90.3	80.7	71.0	61.4	51.7
7	.165	.33	.50	.66	.83	8.99	.15	.32	.48	89.9	79.8	69.7	59.6	49.5
8	.158	.32	.47	.63	.79	.95	.10	.26	.42	9.5	9.0	8.4	7.9	7.4
9	.151	.30	.45	.60	.76	.90	.05	.20	.35	9.0	8.1	7.1	6.1	5.2
54 10	18.143	36.29	54.43	72.57	90.72	108.86	127.00	145.15	163.29	1088.6	2177.2	3265.8	4354.4	5443.0
11	.136	.27	.41	.54	.68	.82	6.95	.09	.22	8.2	6.3	4.5	2.6	40.8
12	.129	.26	.39	.51	.65	.77	.90	5.03	.16	7.7	5.4	3.2	50.9	38.6
13	.121	.24	.36	.49	.61	.73	.85	4.97	.09	7.3	4.6	1.8	49.1	6.4
14	.114	.23	.34	.46	.57	.68	.80	.91	3.03	6.8	3.7	60.5	7.4	4.2
54 15	18.107	36.21	54.32	72.43	90.54	108.64	126.74	144.85	162.96	1086.4	2172.8	3259.2	4345.6	5432.0
16	.099	.20	.30	.40	.50	.60	.69	.80	.89	6.0	1.9	7.9	3.9	29.8
17	.092	.18	.28	.37	.46	.55	.64	.74	.83	5.5	1.0	6.6	2.1	7.7
18	.085	.17	.25	.34	.42	.51	.59	.68	.76	5.1	70.2	5.3	40.4	5.5
19	.078	.16	.23	.31	.39	.47	.54	.62	.70	4.7	69.3	4.0	38.6	3.3
54 20	18.070	36.14	54.21	72.28	90.35	108.42	126.49	144.56	162.63	1084.2	2168.4	3252.7	4336.9	5421.1
21	.063	.13	.19	.25	.31	.38	.44	.50	.56	3.8	7.5	1.3	5.1	18.9
22	.056	.11	.17	.22	.28	.33	.39	.45	.50	3.3	6.7	50.0	3.4	6.7
23	.048	.10	.14	.19	.24	.29	.34	.39	.43	2.9	5.8	48.7	31.6	4.5
24	.041	.08	.12	.16	.21	.25	.29	.33	.37	2.5	4.9	7.4	29.8	2.3
54 25	18.034	36.07	54.10	72.13	90.17	108.20	126.23	144.27	162.30	1082.0	2164.0	3246.1	4328.1	5410.1
26	.026	.05	.08	.10	.13	.16	.18	.21	.23	1.6	3.1	4.8	6.3	07.9
27	.019	.04	.06	.08	.10	.11	.13	.15	.17	1.1	2.3	3.4	4.6	5.7
28	.012	.02	.03	.05	.06	.07	.08	.09	.10	0.7	1.4	2.1	2.8	3.5
29	.004	6.01	4.01	2.02	90.03	8.03	6.03	4.04	2.04	80.3	60.6	40.8	21.1	401.3
54 30	17.997	35.99	53.99	71.99	89.99	107.98	125.98	143.98	161.97	1079.8	2159.7	3239.5	4319.3	5399.1
31	.990	.98	.97	.96	.95	.94	.93	.92	.91	9.4	8.8	8.2	7.6	6.9
32	.982	.96	.95	.93	.91	.89	.88	.86	.84	8.9	7.9	6.8	5.8	4.7
33	.975	.95	.92	.90	.88	.85	.83	.80	.78	8.5	7.0	5.5	4.0	2.5
34	.968	.94	.90	.87	.84	.81	.78	.74	.71	8.1	6.2	4.2	2.3	90.3
54 35	17.960	35.92	53.88	71.84	89.80	107.76	125.72	143.68	161.65	1077.6	2155.3	3232.9	4310.5	5388.1
36	.953	.91	.86	.81	.77	.72	.67	.63	.58	7.2	4.4	1.6	08.8	5.9
37	.946	.89	.84	.78	.73	.67	.62	.57	.51	6.7	3.5	30.2	7.0	3.7
38	.938	.88	.81	.75	.69	.63	.57	.51	.45	6.3	2.6	28.9	5.2	81.5
39	.931	.86	.79	.73	.66	.59	.52	.45	.38	5.9	1.8	7.6	3.5	79.4
54 40	17.924	35.85	53.77	71.70	89.62	107.54	125.47	143.39	161.32	1075.4	2150.9	3226.3	4301.7	5377.2
41	.916	.83	.75	.67	.58	.50	.42	.33	.25	5.0	50.0	5.0	300.0	4.9
42	.909	.82	.73	.64	.54	.45	.36	.27	.18	4.5	49.1	3.6	298.2	2.7
43	.902	.80	.70	.61	.51	.41	.31	.21	.12	4.1	8.2	2.3	6.4	70.5
44	.894	.79	.68	.58	.47	.37	.26	.16	1.05	3.7	7.4	21.0	4.7	68.3
54 45	17.887	35.77	53.66	71.55	89.43	107.32	125.21	143.10	160.99	1073.2	2146.5	3219.7	4292.9	5366.1
46	.880	.76	.64	.52	.40	.28	.16	3.04	.92	2.8	5.6	8.4	91.1	3.9
47	.872	.74	.62	.49	.36	.23	.11	2.98	.85	2.3	4.7	7.0	89.4	61.7
48	.865	.73	.59	.46	.32	.19	.05	.92	.78	1.9	3.8	5.7	7.6	59.5
49	.858	.72	.57	.43	.29	.15	5.00	.86	.72	1.5	2.9	4.4	5.9	7.3
54 50	17.850	35.70	53.55	71.40	89.25	107.10	124.95	142.80	160.65	1071.0	2142.0	3213.1	4284.1	5355.1
51	.843	.69	.53	.37	.21	.06	.90	.74	.58	0.6	1.1	1.7	2.3	2.9
52	.836	.67	.51	.34	.18	7.01	.85	.69	.52	70.1	40.3	10.4	80.6	50.7
53	.828	.66	.48	.31	.14	6.97	.80	.63	.45	69.7	39.4	09.1	78.8	48.5
54	.821	.64	.46	.28	.10	.93	.75	.57	.39	9.3	8.5	7.8	7.0	6.3
54 55	17.814	35.63	53.44	71.25	89.07	106.88	124.69	142.51	160.32	1068.8	2137.6	3206.4	4275.3	5344.1
56	.806	.61	.42	.22	9.03	.84	.64	.45	.25	8.4	6.7	5.1	3.5	41.9
57	.799	.60	.40	.19	8.99	.79	.59	.39	.19	7.9	5.8	3.8	1.7	39.7
58	.791	.58	.37	.17	.95	.75	.54	.33	.12	7.5	5.0	2.5	70.0	7.4
59	.784	.57	.35	.14	.92	.70	.49	.27	60.06	7.0	4.1	201.1	68.2	5.2
54 60	17.777	35.55	53.33	71.11	88.88	106.66	124.44	142.21	159.99	1066.6	2133.2	3199.8	4266.4	5333.0

Lat.		Latitude 54° to 55°—Meridional arcs.						Latitude 54°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 54° 30′		Value of 1′	Continuous sums of minutes from latitude 54° 00′		Longitude.	X	Y
°	′	*Meters.*	″	*Meters.*	*Meters.*	′	*Meters.*	° ′	*Meters.*	*Meters.*
54	00	30.918			1855.10					
	1	8	1	30.92	.11	1	1 855.1	0 1	1 093.0	0.1
	2	9	2	61.84	.11	2	3 710.2	2	2 185.9	0.5
	3	9	3	92.76	.12	3	5 565.3	3	3 278.9	1.2
	4	9	4	123.68	.12	4	7 420.4	4	4 371.9	2.1
54	05	30.919	5	154.60	1855.13	5	9 275.6	0 5	5 464.8	3.2
	6	9	6	185.53	.13	6	11 130.7	6	6 557.8	4.6
	7	9	7	216.45	.14	7	12 985.8	7	7 650.8	6.3
	8	9	8	247.37	.14	8	14 841.0	8	8 743.7	8.2
	9	9	9	278.29	.15	9	16 696.1	9	9 836.7	10.4
54	10	30.919	10	309.21	1855.15	10	18 551.2	0 10	10 929.7	12.9
	11	9	1	340.13	.16	1	20 406.4	15	16 394.5	28.9
	12	9	2	371.05	.16	2	22 261.6	20	21 859.3	51.4
	13	19	3	401.97	.17	3	24 116.7	25	27 324.0	80.4
	14	20	4	432.89	.17	4	25 971.9	30	32 788.8	115.7
54	15	30.920	15	463.81	1855.18	15	27 827.1	0 35	38 253.4	157.5
	16	0	6	494.74	.18	6	29 682.3	40	43 718.0	205.8
	17	0	7	525.66	.19	7	31 537.4	45	49 182.6	260.4
	18	0	8	556.58	.19	8	33 392.6	50	54 647.1	321.5
	19	0	9	587.50	.20	9	35 247.8	55	60 111.5	389.0
54	20	30.920	20	618.42	1855.21	20	37 103.0	1 00	65 575.9	463.0
	21	0	1	649.34	.21	1	38 958.2	05	71 040.1	543.4
	22	0	2	680.26	.22	2	40 813.5	10	76 504.3	630.2
	23	0	3	711.18	.22	3	42 668.7	15	81 968.3	723.4
	24	0	4	742.10	.23	4	44 523.9	20	87 432.3	823.1
54	25	30.921	25	773.02	1855.23	25	46 379.1	1 25	92 896.1	929.1
	26	1	6	803.94	.24	6	48 234.4	30	98 359.8	1 041.7
	27	1	7	834.87	.24	7	50 089.6	35	103 823.3	1 160.6
	28	1	8	865.79	.25	8	51 944.8	40	109 286.7	1 286.0
	29	1	9	896.71	.25	9	53 800.1	45	114 750.0	1 417.8
54	30	30.921	30	927.63	1855.26	30	55 655.3	1 50	120 213.1	1 556.0
	31	1	1	958.55	.26	1	57 510.6	55	125 676.0	1 700.7
	32	1	2	989.47	.27	2	59 365.9	2 00	131 139	1 852
	33	1	3	1 020.39	.27	3	61 221.2	3 00	196 675	4 166
	34	1	4	1 051.31	.28	4	63 076.4	4 00	262 173	7 406
54	35	30.921	35	1 082.23	1855.28	35	64 931.7	5 00	327 618	11 570
	36	1	6	1 113.15	.29	6	66 787.0	6 00	392 998	16 657
	37	2	7	1 144.08	.29	7	68 642.3	7 00	458 300	22 668
	38	2	8	1 175.00	.30	8	70 497.6	8 00	523 510	29 599
	39	2	9	1 205.92	.30	9	72 352.9	9 00	588 616	37 451
54	40	30.922	40	1 236.84	1855.31	40	74 208.2	10 00	653 604	46 221
	41	2	1	1 267.76	.31	1	76 063.5	11 00	718 462	55 908
	42	2	2	1 298.68	.32	2	77 918.8	12 00	783 177	66 510
	43	2	3	1 329.60	.32	3	79 774.1	13 00	847 736	78 024
	44	2	4	1 360.52	.33	4	81 629.5	14 00	912 125	90 449
54	45	30.922	45	1 391.44	1855.34	45	83 484.8	15 00	976 333	103 782
	46	2	6	1 422.36	.34	6	85 340.1	16 00	1 040 347	118 020
	47	2	7	1 453.28	.35	7	87 195.5	17 00	1 104 152	133 161
	48	3	8	1 484.21	.35	8	89 050.8	18 00	1 167 738	149 200
	49	3	9	1 515.13	.36	9	90 906.2	19 00	1 231 091	166 136
54	50	30.923	50	1 546.05	1855.36	50	92 761.5	20 00	1 294 198	183 965
	51	3	1	1 576.97	.37	1	94 616.9	21 00	1 357 048	202 683
	52	3	2	1 607.89	.37	2	96 472.3	22 00	1 419 627	222 287
	53	3	3	1 638.81	.38	3	98 327.6	23 00	1 481 922	242 772
	54	3	4	1 669.73	.38	4	100 183.0	24 00	1 543 923	264 135
54	55	30.923	55	1 700.65	1855.39	55	102 038.4	25 00	1 605 615	286 371
	56	3	6	1 731.57	.39	6	103 893.8	26 00	1 666 988	309 476
	57	3	7	1 762.49	.40	7	105 749.2	27 00	1 728 028	333 445
	58	3	8	1 793.42	.40	8	107 604.6	28 00	1 788 723	358 274
	59	3	9	1 824.34	.41	9	109 460.0	29 00	1 849 062	383 957
54	60	30.924	60	1 855.26	1855.41	60	111 315.4	30 00	1 909 033	410 490

Latitude 55° to 56°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
55 00	17.777	35.55	53.33	71.11	88.88	106.66	124.44	142.21	159.99	1066.6	2133.2	3199.8	4266.4	5333.0
1	.769	.54	.31	.08	.84	.62	.39	.16	.92	6.2	2.3	8.5	4.7	30.8
2	.762	.52	.29	.05	.81	.57	.34	.10	.86	5.7	1.4	7.2	2.9	28.6
3	.755	.51	.26	1.02	.77	.53	.28	2.04	.79	5.3	30.6	5.8	61.1	6.4
4	.747	.49	.24	0.99	.74	.48	.23	1.98	.73	4.8	29.7	4.5	59.3	4.2
55 05	17.740	35.48	53.22	70.96	88.70	106.44	124.18	141.92	159.66	1064.4	2128.8	3193.2	4257.6	5322.0
6	.733	.47	.20	.93	.66	.40	.13	.86	.59	4.0	7.9	1.9	5.8	19.8
7	.725	.45	.18	.90	.63	.35	.08	.80	.53	3.5	7.0	90.5	4.0	7.5
8	.718	.44	.15	.87	.59	.31	4.02	.74	.46	3.1	6.2	89.2	2.3	5.3
9	.710	.42	.13	.84	.56	.26	3.97	.68	.40	2.6	5.3	7.9	50.5	3.1
55 10	17.703	35.41	53.11	70.81	88.52	106.22	123.92	141.62	159.33	1062.2	2124.4	3186.5	4248.7	5310.9
11	.696	.39	.09	.78	.48	.17	.87	.56	.26	1.7	3.5	5.2	6.9	08.7
12	.688	.38	.07	.75	.45	.13	.82	.51	.20	1.3	2.6	3.9	5.2	6.5
13	.681	.36	.04	.72	.41	.08	.76	.45	.13	0.8	1.7	2.5	3.4	4.2
14	.673	.35	.02	.69	.37	.04	.71	.39	.06	0.4	20.8	81.2	1.6	302.0
55 15	17.666	35.33	53.00	70.66	88.33	106.00	123.66	141.33	159.00	1060.0	2119.9	3179.9	4239.8	5299.8
16	.659	.32	2.98	.63	.30	5.95	.61	.27	8.93	59.5	9.0	8.6	8.1	7.6
17	.651	.30	.95	.60	.26	.91	.56	.21	.86	9.1	8.1	7.2	6.3	5.4
18	.644	.29	.93	.58	.22	.86	.50	.15	.79	8.6	7.3	5.9	4.5	3.2
19	.636	.27	.91	.55	.19	.82	.45	.09	.73	8.2	6.4	4.6	2.8	90.9
55 20	17.629	35.26	52.89	70.52	88.15	105.77	123.40	141.03	158.66	1057.7	2115.5	3173.2	4231.0	5288.7
21	.622	.24	.87	.49	.11	.73	.35	0.97	.59	7.3	4.6	1.9	29.2	6.5
22	.614	.23	.84	.46	.08	.69	.30	.91	.53	6.9	3.7	70.6	7.4	4.3
23	.607	.21	.82	.43	.04	.64	.25	.85	.46	6.4	2.8	69.2	5.6	82.1
24	.599	.20	.80	.40	8.00	.60	.20	.80	.40	6.0	1.9	7.9	3.9	79.8
55 25	17.592	35.18	52.78	70.37	87.97	105.55	123.14	140.74	158.33	1055.5	2111.0	3166.6	4222.1	5277.6
26	.585	.17	.75	.34	.93	.51	.09	.68	.26	5.1	10.1	5.2	20.3	5.4
27	.577	.15	.73	.31	.89	.46	3.04	.62	.20	4.6	09.2	3.9	18.5	3.2
28	.570	.14	.71	.28	.85	.42	2.99	.56	.13	4.2	8.4	2.6	6.8	70.9
29	.562	.12	.69	.25	.82	.37	.94	.50	.06	3.7	7.5	61.2	5.0	68.7
55 30	.555	35.11	52.67	70.22	87.78	105.33	122.89	140.44	158.00	1053.3	2106.6	3159.9	4213.2	5266.5
31	.548	.10	.64	.19	.74	.29	.84	.38	7.93	2.9	5.7	8.6	11.4	4.3
32	.540	.08	.62	.16	.70	.24	.79	.32	.86	2.4	4.8	7.2	09.6	62.1
33	.533	.07	.60	.13	.67	.20	.73	.26	.80	2.0	3.9	5.9	7.9	59.8
34	.525	.05	.58	.10	.63	.15	.68	.20	.73	1.5	3.0	4.6	6.1	7.6
55 35	17.518	35.04	52.55	70.07	87.59	105.11	122.63	140.14	157.66	1051.1	2102.1	3153.2	4204.3	5255.4
36	.510	.02	.53	.04	.55	.06	.58	.08	.60	0.6	1.2	1.9	2.5	3.1
37	.503	5.01	.51	70.01	.51	5.02	.53	40.02	.53	50.2	100.3	50.6	200.7	50.9
38	.496	4.99	.49	69.98	.48	4.97	.47	39.97	.46	49.7	099.5	49.2	199.0	48.7
39	.488	.98	.46	.95	.44	.93	.42	.91	.40	9.3	8.6	7.9	7.2	6.5
55 40	17.481	34.96	52.44	69.92	87.40	104.89	122.37	139.85	157.33	1048.9	2097.7	3146.6	4195.4	5244.3
41	.473	.95	.42	.89	.36	.84	.32	.79	.26	8.4	6.8	5.2	3.6	42.0
42	.466	.93	.40	.86	.33	.80	.27	.73	.20	8.0	5.9	3.9	1.8	39.8
43	.459	.92	.38	.83	.29	.75	.21	.67	.13	7.5	5.0	2.5	90.0	7.6
44	.451	.90	.35	.80	.25	.71	.16	.61	.06	7.1	4.1	41.2	88.3	5.3
55 45	17.444	34.89	52.33	69.77	87.21	104.66	122.11	139.55	157.00	1046.6	2093.2	3139.9	4186.5	5233.1
46	.436	.87	.31	.74	.18	.62	.06	.49	6.93	6.2	2.3	8.5	4.7	30.9
47	.429	.86	.29	.71	.14	.57	2.01	.43	.86	5.7	1.4	7.2	2.9	28.6
48	.421	.84	.26	.69	.10	.53	1.95	.37	.79	5.3	90.6	5.8	81.1	6.4
49	.414	.83	.24	.66	.07	.48	.90	.31	.73	4.8	89.7	4.5	79.3	4.2
55 50	17.406	34.81	52.22	69.63	87.03	104.44	121.85	139.25	156.66	1044.4	2088.8	3133.2	4177.6	5221.9
51	.399	.80	.20	.60	6.99	.39	.80	.19	.59	3.9	7.9	1.8	5.8	19.7
52	.392	.78	.18	.57	.96	.35	.74	.13	.53	3.5	7.0	30.5	4.0	7.5
53	.384	.77	.15	.54	.92	.30	.69	.07	.46	3.0	6.1	29.1	2.2	5.2
54	.377	.75	.13	.51	.88	.26	.64	9.01	.39	2.6	5.2	7.8	70.4	3.0
55 55	17.369	34.74	52.11	69.48	86.85	104.22	121.58	138.95	156.33	1042.2	2084.3	3126.5	4168.6	5210.8
56	.362	.72	.09	.45	.81	.17	.53	.89	.26	1.7	3.4	5.1	6.8	08.5
57	.354	.71	.06	.42	.77	.13	.48	.83	.19	1.3	2.5	3.8	5.0	6.3
58	.347	.69	.04	.39	.73	.08	.43	.77	.12	0.8	1.6	2.4	3.2	4.1
59	.339	.68	.02	.36	.70	4.04	.37	.72	6.06	40.4	80.7	21.1	61.5	201.8
55 60	17.332	34.66	52.00	69.33	86.66	103.99	121.32	138.66	155.99	1039.9	2079.8	3119.8	4159.7	5199.6

Lat.		Latitude 55° to 56°—Meridional arcs.						Latitude 55°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 55° 30′		Value of 1′	Continuous sums of minutes from latitude 55° 00′		Longitude.	X	Y
°	′	*Meters.*	″	*Meters.*	*Meters.*	′	*Meters.*	° ′	*Meters.*	*Meters.*
55	00	30.924			1855.41					
	1	4	1	30.93	.42	1	1 855.4	0 1	1 066.6	0.1
	2	4	2	61.85	.42	2	3 710.8	2	2 133.2	0.5
	3	4	3	92.78	.43	3	5 566.3	3	3 199.8	1.1
	4	4	4	123.70	.43	4	7 421.7	4	4 266.4	2.0
55	05	30.924	5	154.63	1855.44	5	9 277.1	0 5	5 333.0	3.2
	6	4	6	185.56	.44	6	11 132.6	6	6 399.6	4.6
	7	4	7	216.48	.45	7	12 988.0	7	7 466.2	6.2
	8	4	8	247.41	.45	8	14 843.5	8	8 532.8	8.1
	9	4	9	278.34	.46	9	16 698.9	9	9 599.4	10.3
55	10	30.924	10	309.26	1855.46	10	18 554.4	0 10	10 666.1	12.7
	11	4	1	340.19	.47	1	20 409.9	15	15 999.1	28.6
	12	5	2	371.11	.47	2	22 265.3	20	21 332.1	50.8
	13	5	3	402.04	.48	3	24 120.8	25	26 665.0	79.4
	14	5	4	432.97	.49	4	25 976.3	30	31 997.9	114.4
55	15	30.925	15	463.89	1855.49	15	27 831.8	0 35	37 330.8	155.7
	16	5	6	494.82	.50	6	29 687.3	40	42 663.6	203.3
	17	5	7	525.74	.50	7	31 542.8	45	47 996.4	257.3
	18	5	8	556.67	.51	8	33 398.3	50	53 329.1	317.7
	19	5	9	587.60	.51	9	35 253.8	55	58 661.7	384.4
55	20	30.925	20	618.52	1855.52	20	37 109.3	1 00	63 994.2	457.5
	21	5	1	649.45	.52	1	38 964.8	05	69 326.7	536.9
	22	5	2	680.37	.53	2	40 820.4	10	74 659.0	622.7
	23	6	3	711.30	.53	3	42 675.9	15	79 991.3	714.8
	24	6	4	742.23	.54	4	44 531.4	20	85 323.4	813.3
55	25	30.926	25	773.15	1855.54	25	46 387.0	1 25	90 655.4	918.1
	26	6	6	804.08	.55	6	48 242.5	30	95 987.3	1 029.3
	27	6	7	835.01	.55	7	50 098.1	35	101 319.0	1 146.8
	28	6	8	865.93	.56	8	51 953.6	40	106 650.6	1 270.7
	29	6	9	896.86	.56	9	53 809.2	45	111 982.1	1 400.9
55	30	30.926	30	927.78	1855.57	30	55 664.7	1 50	117 313.3	1 537.5
	31	6	1	958.71	.57	1	57 520.3	55	122 644.5	1 680.5
	32	6	2	989.64	.58	2	59 375.9	2 00	127 975	1 830
	33	6	3	1 020.56	.58	3	61 231.4	3 00	191 930	4 117
	34	6	4	1 051.49	.59	4	63 087.0	4 00	255 846	7 318
55	35	30.927	35	1 082.41	1855.59	35	64 942.6	5 00	319 710	11 432
	36	7	6	1 113.34	.60	6	66 798.2	6 00	383 508	16 459
	37	7	7	1 144.27	.60	7	68 653.8	7 00	447 228	22 398
	38	7	8	1 175.19	.61	8	70 509.4	8 00	510 856	29 246
	39	7	9	1 206.12	.61	9	72 365.0	9 00	574 380	37 004
55	40	30.927	40	1 237.04	1855.62	40	74 220.7	10 00	637 786	45 670
	41	7	1	1 267.97	.62	1	76 076.3	11 00	701 062	55 240
	42	7	2	1 298.90	.63	2	77 931.9	12 00	764 195	65 715
	43	7	3	1 329.82	.63	3	79 787.6	13 00	827 172	77 091
	44	7	4	1 360.75	.64	4	81 643.2	14 00	889 980	89 366
55	45	30.927	45	1 391.68	1855.64	45	83 498.8	15 00	952 605	102 538
	46	7	6	1 422.60	.65	6	85 354.5	16 00	1 015 036	116 604
	47	8	7	1 453.53	.65	7	87 210.1	17 00	1 077 260	131 561
	48	8	8	1 484.45	.66	8	89 065.8	18 00	1 139 263	147 406
	49	8	9	1 515.38	.66	9	90 921.5	19 00	1 201 033	164 135
55	50	30.928	50	1 546.31	1855.67	50	92 777.1	20 00	1 262 558	181 747
	51	8	1	1 577.23	.68	1	94 632.8	21 00	1 323 825	200 236
	52	8	2	1 608.16	.68	2	96 488.4	22 00	1 384 821	219 599
	53	8	3	1 639.08	.69	3	98 344.1	23 00	1 445 535	239 832
	54	8	4	1 670.01	.69	4	100 199.8	24 00	1 505 952	260 931
55	55	30.928	55	1 700.94	1855.70	55	102 055.5	25 00	1 566 063	282 891
	56	8	6	1 731.86	.70	6	103 911.2	26 00	1 625 853	305 709
	57	8	7	1 762.79	.71	7	105 766.9	27 00	1 685 310	329 379
	58	9	8	1 793.72	.71	8	107 622.6	28 00	1 744 423	353 896
	59	9	9	1 824.64	.72	9	109 478.3	29 00	1 803 179	379 257
55	60	30.929	60	1 855.57	1855.72	60	111 334.0	30 00	1 861 567	405 454

Latitude 56° to 57°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
56 00	17.332	34.66	52.00	69.33	86.66	103.99	121.32	138.66	155.99	1039.9	2079.8	3119.8	4159.7	5199.6
1	.324	.65	1.97	.30	.62	.95	.27	.60	.92	9.5	8.9	8.4	7.9	7.3
2	.317	.63	.95	.27	.59	.90	.22	.54	.86	9.0	8.0	7.1	6.1	5.1
3	.310	.62	.93	.24	.55	.86	.16	.48	.79	8.6	7.2	5.7	4.3	2.9
4	.302	.60	.91	.21	.51	.81	.11	.42	.72	8.1	6.3	4.4	2.5	90.6
56 05	17.295	34.59	51.88	69.18	86.48	103.77	121.06	138.36	155.65	1037.7	2075.4	3113.0	4150.7	5188.4
6	.287	.57	.86	.15	.44	.72	1.01	.30	.59	7.2	4.5	1.7	48.9	6.1
7	.280	.56	.84	.12	.40	.68	0.96	.24	.52	6.8	3.6	10.3	7.1	3.9
8	.272	.54	.82	.09	.36	.63	.90	.18	.45	6.3	2.7	09.0	5.3	81.7
9	.265	.53	.79	.06	.33	.59	.85	.12	.38	5.9	1.8	7.7	3.5	79.4
56 10	17.257	34.51	51.77	69.03	86.29	103.54	120.80	138.06	155.32	1035.4	2070.9	3106.3	4141.7	5177.2
11	.250	.50	.75	9.00	.25	.50	.75	8.00	.25	5.0	70.0	5.0	40.0	4.9
12	.242	.48	.73	8.97	.21	.45	.70	7.94	.18	4.5	69.1	3.6	38.2	2.7
13	.235	.47	.70	.94	.18	.41	.64	.88	.11	4.1	8.2	2.3	6.4	70.4
14	.227	.45	.68	.91	.14	.36	.59	.82	5.05	3.6	7.3	100.9	4.6	68.2
56 15	17.220	34.44	51.66	68.88	86.10	103.32	120.54	137.76	154.98	1033.2	2066.4	3099.6	4132.8	5166.0
16	.212	.43	.64	.85	.06	.27	.49	.70	.91	2.7	5.5	8.2	31.0	3.7
17	.205	.41	.62	.82	6.02	.23	.44	.64	.84	2.3	4.6	6.9	29.2	61.5
18	.197	.40	.59	.79	5.99	.18	.38	.58	.78	1.8	3.7	5.5	7.4	59.2
19	.190	.38	.57	.76	.95	.14	.33	.52	.71	1.4	2.8	4.2	5.6	7.0
56 20	17.182	34.37	51.55	68.73	85.91	103.09	120.28	137.46	154.64	1030.9	2061.9	3092.8	4123.8	5154.7
21	.175	.35	.53	.70	.87	.05	.23	.40	.57	0.5	1.0	1.5	2.0	2.5
22	.167	.34	.50	.67	.84	3.00	.17	.34	.51	30.0	60.1	90.1	20.2	50.2
23	.160	.32	.48	.64	.80	2.96	.12	.28	.44	29.6	59.2	88.8	18.4	48.0
24	.152	.31	.46	.61	.76	.91	.07	.22	.37	9.1	8.3	7.4	6.6	5.7
56 25	17.145	34.29	51.43	68.58	85.73	102.87	120.01	137.16	154.31	1028.7	2057.4	3086.1	4114.8	5143.5
26	.137	.28	.41	.55	.69	.82	19.96	.10	.24	8.2	6.5	4.7	3.0	41.2
27	.130	.26	.39	.52	.65	.78	.91	7.04	.17	7.8	5.6	3.4	11.2	39.0
28	.123	.25	.37	.49	.61	.74	.86	6.98	.10	7.4	4.7	2.1	09.4	6.8
29	.115	.23	.34	.46	.58	.69	.80	.92	4.04	6.9	3.8	80.7	7.6	4.5
56 30	17.108	34.22	51.32	68.43	85.54	102.65	119.75	136.86	153.97	1026.5	2052.9	3079.4	4105.8	5132.3
31	.100	.20	.30	.40	.50	.60	.70	.80	.90	6.0	2.0	8.0	4.0	30.0
32	.092	.19	.28	.37	.46	.55	.65	.74	.83	5.5	1.1	6.6	2.2	27.7
33	.085	.17	.25	.34	.43	.51	.59	.68	.77	5.1	50.2	5.3	100.4	5.5
34	.077	.16	.23	.31	.39	.46	.54	.62	.70	4.6	49.3	3.9	098.6	3.2
56 35	17.070	34.14	51.21	68.28	85.35	102.42	119.49	136.56	153.63	1024.2	2048.4	3072.6	4096.8	5121.0
36	.062	.12	.19	.25	.31	.37	.44	.50	.56	3.7	7.5	71.2	5.0	18.7
37	.055	.11	.17	.22	.27	.33	.39	.44	.49	3.3	6.6	69.9	3.2	6.5
38	.047	.09	.14	.19	.24	.28	.33	.38	.43	2.8	5.7	8.5	91.4	4.2
39	.040	.08	.12	.16	.20	.24	.28	.32	.36	2.4	4.8	7.2	89.6	12.0
56 40	17.032	34.06	51.10	68.13	85.16	102.19	119.23	136.26	153.29	1021.9	2043.9	3065.8	4087.8	5109.7
41	.025	.05	.08	.10	.12	.15	.18	.20	.22	1.5	3.0	4.5	6.0	7.5
42	.017	.03	.05	.07	.09	.10	.12	.14	.15	1.0	2.1	3.1	4.2	5.2
43	.010	.02	.03	.04	.05	.06	.07	.08	.09	0.6	1.2	1.8	2.4	2.9
44	.002	4.00	1.01	8.01	5.01	2.01	9.02	6.02	3.02	20.1	40.3	60.4	80.6	100.7
56 45	16.995	33.99	50.98	67.98	84.98	101.97	118.96	135.96	152.95	1019.7	2039.4	3059.1	4078.7	5098.4
46	.987	.97	.96	.95	.94	.92	.91	.90	.88	9.2	8.5	7.7	6.9	6.2
47	.980	.96	.94	.92	.90	.88	.86	.84	.82	8.8	7.6	6.4	5.1	3.9
48	.972	.94	.92	.89	.86	.83	.81	.78	.75	8.3	6.7	5.0	3.3	91.7
49	.965	.93	.89	.86	.83	.79	.75	.72	.68	7.9	5.8	3.6	71.5	89.4
56 50	16.957	33.91	50.87	67.83	84.79	101.74	118.70	135.66	152.61	1017.4	2034.9	3052.3	4069.7	5087.2
51	.950	.90	.85	.80	.75	.70	.65	.60	.54	7.0	4.0	50.9	7.9	4.9
52	.942	.88	.83	.77	.71	.65	.59	.54	.48	6.5	3.1	49.6	6.1	2.6
53	.935	.87	.80	.74	.68	.61	.54	.48	.41	6.1	2.1	8.2	4.3	80.4
54	.927	.85	.78	.71	.64	.56	.49	.42	.34	5.6	1.2	6.9	2.5	78.1
56 55	16.919	33.84	50.76	67.68	84.60	101.52	118.43	135.36	152.27	1015.2	2030.3	3045.5	4060.7	5075.8
56	.912	.82	.74	.65	.56	.47	.38	.30	.21	4.7	29.4	4.1	58.9	3.6
57	.904	.81	.71	.62	.52	.43	.33	.24	.14	4.3	8.5	2.8	7.1	71.3
58	.897	.79	.69	.59	.49	.38	.28	.17	.07	3.8	7.6	1.4	5.2	69.1
59	.889	.78	.67	.56	.45	.34	.22	.11	2.01	3.4	6.7	40.1	3.4	6.8
56 60	16.882	33.76	50.65	67.53	84.41	101.29	118.17	135.05	151.94	1012.9	2025.8	3038.7	4051.6	5064.5

Lat.		Latitude 56° to 57°—Meridional arcs.						Latitude 56°—Co-ordinates of curvature.		
		Value of 1′	Sums of seconds for middle latitude 56° 30′		Value of 1′	Continuous sums of minutes from latitude 56° 00′		Longitude.	X	Y
°	′	Meters.	″	Meters.	Meters.	′	Meters.	° ′	Meters.	Meters.
56	00	30.929			1855.72					
	1	9	1	30.93	.73	1	1 855.7	0 1	1 039.9	0.1
	2	9	2	61.86	.73	2	3 711.5	2	2 079.8	0.5
	3	9	3	92.79	.74	3	5 567.2	3	3 119.8	1.1
	4	9	4	123.72	.74	4	7 422.9	4	4 159.7	2.0
56	05	30.929	5	154.66	1855.75	5	9 278.7	0 5	5 199.6	3.1
	6	9	6	185.59	.75	6	11 134.4	6	6 239.5	4.5
	7	9	7	216.52	.76	7	12 990.2	7	7 279.4	6.1
	8	9	8	247.45	.76	8	14 845.9	8	8 319.3	8.0
	09	29	9	278.38	.77	9	16 701.7	9	9 359.2	10.2
56	10	30.930	10	309.31	1855.77	10	18 557.5	0 10	10 399.2	12.5
	11	0	1	340.24	.78	1	20 413.2	15	15 598.7	28.2
	12	0	2	371.17	.78	2	22 269.0	20	20 798.3	50.2
	13	0	3	402.11	.79	3	24 124.8	25	25 997.8	78.4
	14	0	4	433.04	.79	4	25 980.6	30	31 197.3	112.9
56	15	30.930	15	463.97	1855.80	15	27 836.4	0 35	36 396.7	153.6
	16	0	6	494.90	.80	6	29 692.2	40	41 596.0	200.6
	17	0	7	525.83	.81	7	31 548.0	45	46 795.4	253.9
	18	0	8	556.76	.81	8	33 403.8	50	51 994.6	313.5
	19	0	9	587.69	.82	9	35 259.6	55	57 193.8	379.3
56	20	30.930	20	618.62	1855.82	20	37 115.4	1 00	62 392.9	451.4
	21	0	1	649.56	.83	1	38 971.3	05	67 591.9	529.8
	22	1	2	680.49	.83	2	40 827.1	10	72 790.8	614.4
	23	1	3	711.42	.84	3	42 682.9	15	77 989.6	705.3
	24	1	4	742.35	.84	4	44 538.8	20	83 188.2	802.5
56	25	30.931	25	773.28	1855.85	25	46 394.6	1 25	88 386.8	905.9
	26	1	6	804.21	.85	6	48 250.5	30	93 585.2	1 015.6
	27	1	7	835.14	.86	7	50 106.3	35	98 783.5	1 131.6
	28	1	8	866.07	.86	8	51 962.2	40	103 981.7	1 253.8
	29	1	9	897.01	.87	9	53 818.0	45	109 179.7	1 382.4
56	30	30.931	30	927.94	1855.87	30	55 673.9	1 50	114 377.5	1 517.1
	31	1	1	958.87	.88	1	57 529.8	55	119 575.2	1 658.2
	32	1	2	989.80	.88	2	59 385.7	2 00	124 773	1 806
	33	1	3	1 020.73	.89	3	61 241.6	3 00	187 126	4 062
	34	2	4	1 051.66	.89	4	63 097.5	4 00	249 441	7 221
56	35	30.932	35	1 082.59	1855.90	35	64 953.4	5 00	311 703	11 280
	36	2	6	1 113.52	.90	6	66 809.3	6 00	373 900	16 241
	37	2	7	1 144.46	.91	7	68 665.2	7 00	436 019	22 100
	38	2	8	1 175.39	.91	8	70 521.1	8 00	498 047	28 858
	39	2	9	1 206.32	.92	9	72 377.0	9 00	559 970	36 512
56	40	30.932	40	1 237.25	1855.92	40	74 232.9	10 00	621 776	45 062
	41	2	1	1 268.18	.93	1	76 088.8	11 00	683 451	54 506
	42	2	2	1 299.11	.93	2	77 944.8	12 00	744 984	64 840
	43	2	3	1 330.04	.94	3	79 800.7	13 00	806 361	76 064
	44	2	4	1 360.97	.94	4	81 656.7	14 00	867 569	88 174
56	45	30.932	45	1 391.91	1855.95	45	83 512.6	15 00	928 595	101 169
	46	3	6	1 422.84	.95	6	85 368.6	16 00	989 427	115 046
	47	3	7	1 453.77	.96	7	87 224.5	17 00	1 050 051	129 801
	48	3	8	1 484.70	.96	8	89 080.5	18 00	1 110 456	145 432
	49	3	9	1 515.63	.97	9	90 936.4	19 00	1 170 629	161 935
56	50	30.933	50	1 546.56	1855.97	50	92 792.4	20 00	1 230 556	179 308
	51	3	1	1 577.49	.98	1	94 648.4	21 00	1 290 226	197 545
	52	3	2	1 608.42	.98	2	96 504.4	22 00	1 349 625	216 644
	53	3	3	1 639.36	5.99	3	98 360.4	23 00	1 408 742	236 600
	54	3	4	1 670.29	6.00	4	100 216.3	24 00	1 467 564	257 410
56	55	30.933	55	1 701.22	1856.00	55	102 072.3	25 00	1 526 079	279 069
	56	3	6	1 732.15	.01	6	103 928.3	26 00	1 584 275	301 572
	57	4	7	1 763.08	.01	7	105 784.4	27 00	1 642 138	324 914
	58	4	8	1 794.01	.02	8	107 640.4	28 00	1 699 658	349 092
	59	4	9	1 824.94	.02	9	109 496.4	29 00	1 756 822	374 099
56	60	30.934	60	1 855.87	1856.03	60	111 352.4	30 00	1 813 618	399 930

Latitude 57° to 58°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
57 00	16.882	33.76	50.65	67.53	84.41	101.29	118.17	135.05	151.94	1012.9	2025.8	3038.7	4051.6	5064.5
1	.874	.75	.62	50	.37	.25	.12	4.99	.87	2.5	4.9	7.4	49.8	2.3
2	.867	.73	.60	.47	.33	.20	.06	.93	.80	2.0	4.0	6.0	8.0	60.0
3	.859	.72	.58	.44	.30	.15	8.01	.87	.73	1.5	3.1	4.6	6.2	57.7
4	.852	.70	.56	.41	.26	.11	7.96	.81	.67	1.1	2.2	3.3	4.4	5.5
57 05	16.844	33.69	50.53	67.38	84.22	101.06	117.90	134.75	151.60	1010.6	2021.3	3031.9	4042.6	5053.2
6	.836	.67	.51	.35	.18	1.02	.85	.69	.53	10.2	20.4	30.6	40.7	50.9
7	.829	.66	.49	.32	.14	0.97	.80	.63	.46	09.7	19.5	29.2	38.9	48.7
8	.821	.64	.46	.29	.11	.93	.75	.57	.39	9.3	8.6	7.8	7.1	6.4
9	.814	.63	.44	.26	.07	.88	.69	.51	.32	8.8	7.7	6.5	5.3	4.1
57 10	16.806	33.61	50.42	67.23	84.03	100.84	117.64	134.45	151.26	1008.4	2016.8	3025.1	4033.5	5041.9
11	.799	.60	.40	.20	3.99	.79	.59	.39	.19	7.9	5.9	3.8	31.7	39.6
12	.791	.58	.37	.17	.95	.75	.53	.33	.12	7.5	5.0	2.4	29.9	7.3
13	.784	.57	.35	.13	.92	.70	.48	.27	1.05	7.0	4.0	21.0	8.0	5.1
14	.776	.55	.33	.10	.88	.66	.43	.21	0.99	6.6	3.1	19.7	6.2	2.8
57 15	16.768	33.54	50.30	67.07	83.84	100.61	117.37	134.15	150.92	1006.1	2012.2	3018.3	4024.4	5030.5
16	.761	.52	.28	.04	.80	.56	.32	.09	.85	5.6	1.3	6.9	2.6	28.2
17	.753	.51	.26	7.01	.76	.52	.27	4.03	.78	5.2	10.4	5.6	20.8	6.0
18	.746	.49	.24	6.98	.73	.47	.22	3.97	.71	4.7	09.5	4.2	19.0	3.7
19	.738	.48	.21	.95	.69	.43	.16	.90	.65	4.3	8.6	2.9	7.1	21.4
57 20	16.731	33.46	50.19	66.92	83.65	100.38	117.11	133.84	150.58	1003.8	2007.7	3011.5	4015.3	5019.2
21	.723	.45	.17	.89	.61	.34	.06	.78	.51	3.4	6.8	10.1	3.5	6.9
22	.715	.43	.15	.86	.57	.29	7.00	.72	.44	2.9	5.9	08.8	11.7	4.6
23	.708	.42	.12	.83	.54	.25	6.95	.66	.37	2.5	4.9	7.4	09.9	2.3
24	.700	.40	.10	.80	.50	.20	.90	.60	.30	2.0	4.0	6.0	8.1	10.1
57 25	16.693	33.39	50.08	66.77	83.46	100.16	116.84	133.54	150.24	1001.6	2003.1	3004.7	4006.2	5007.8
26	.685	.37	.05	.74	.42	.11	.79	.48	.17	1.1	2.2	3.3	4.4	5.5
27	.677	.35	.03	.71	.38	.06	.74	.42	.10	0.6	1.3	1.9	2.6	3.2
28	.670	.34	50.01	.68	.35	100.02	.69	.36	50.03	1000.2	2000.4	3000.6	4000.8	5001.0
29	.662	.32	49.99	.65	.31	99.97	.63	.30	49.96	999.7	1999.5	2999.2	3999.0	4998.7
57 30	16.655	33.31	49.96	66.62	83.27	99.93	116.58	133.24	149.89	999.3	1998.6	2997.9	3997.1	4996.4
31	.647	.29	.94	.59	.23	.88	.53	.18	.82	8.8	7.7	6.5	5.3	4.1
32	.640	.28	.92	.56	.19	.84	.47	.12	.75	8.4	6.8	5.1	3.5	91.9
33	.632	.26	.90	.53	.16	.79	.42	.06	.69	7.9	5.8	3.7	91.7	89.6
34	.624	.25	.87	.50	.12	.75	.37	3.00	.62	7.5	4.9	2.4	89.8	7.3
57 35	16.617	33.23	49.85	66.47	83.08	99.70	116.31	132.93	149.55	997.0	1994.0	2991.0	3988.0	4985.0
36	.609	.22	.83	.44	.04	.65	.26	.87	.48	6.5	3.1	89.6	6.2	2.7
37	.602	.20	.81	.41	3.00	.61	.21	.81	.41	6.1	2.2	8.3	4.4	80.5
38	.594	.19	.78	.38	2.97	.56	.16	.75	.35	5.6	1.3	6.9	2.5	78.2
39	.586	.17	.76	.35	.93	.52	.10	.69	.28	5.2	90.4	5.5	80.7	5.9
57 40	16.579	33.16	49.74	66.32	82.89	99.47	116.05	132.63	149.21	994.7	1989.5	2984.2	3978.9	4973.6
41	.571	.14	.71	.29	.85	.43	6.00	.57	.14	4.3	8.6	2.8	7.1	71.3
42	.564	.13	.69	.25	.81	.38	5.94	.51	.07	3.8	7.6	1.4	5.3	69.1
43	.556	.11	.67	.22	.78	.34	.89	.45	9.01	3.4	6.7	80.1	3.4	6.8
44	.548	.10	.65	.19	.74	.29	.84	.39	8.94	2.9	5.8	78.7	71.6	4.5
57 45	16.541	33.08	49.62	66.16	82.70	99.24	115.78	132.33	148.87	992.4	1984.9	2977.3	3969.8	4962.2
46	.533	.07	.60	.13	.66	.20	.73	.26	.80	2.0	4.0	6.0	7.9	59.9
47	.525	.05	.58	.10	.62	.15	.68	.20	.73	1.5	3.1	4.6	6.1	7.6
48	.518	.04	.55	.07	.59	.11	.63	.14	.66	1.1	2.1	3.2	4.3	5.4
49	.510	.02	.53	.04	.55	.06	.57	.08	.59	0.6	1.2	1.8	2.5	3.1
57 50	16.503	33.01	49.51	66.01	82.51	99.02	115.52	132.02	148.53	990.2	1980.3	2970.5	3960.6	4950.8
51	.495	2.99	.49	5.98	.47	8.97	.47	1.96	.46	89.7	79.4	69.1	58.8	48.5
52	.487	.97	.46	.95	.43	.92	.41	.90	.39	9.2	8.5	7.7	7.0	6.2
53	.480	.96	.44	.92	.40	.88	.36	.84	.32	8.8	7.5	6.4	5.1	3.9
54	.472	.94	.42	.89	.36	.83	.30	.78	.25	8.3	6.6	5.0	3.3	41.6
57 55	16.465	32.93	49.39	65.86	82.32	98.79	115.25	131.72	148.18	987.9	1975.7	2963.6	3951.5	4939.4
56	.457	.91	.37	.83	.28	.74	.20	.66	.11	7.4	4.8	2.2	49.7	7.1
57	.449	.90	.35	.80	.24	.70	.14	.59	8.04	7.0	3.9	60.9	7.8	4.8
58	.442	.88	.33	.77	.21	.65	.09	.53	7.97	6.5	3.0	59.5	6.0	2.5
59	.434	.87	.30	.74	.17	.60	5.03	.47	.90	6.0	2.1	8.1	4.2	30.2
57 60	16.426	32.85	49.28	65.71	82.13	98.56	114.98	131.41	147.84	985.6	1971.2	2956.8	3942.3	4927.9

Lat.		Latitude 57° to 58°—Meridional arcs.						Latitude 57°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 57° 30′		Value of 1′	Continuous sums of minutes from latitude 57° 00′		Longitude.	X	Y
°	′	*Meters.*	″	*Meters.*	*Meters.*	′	*Meters.*	° ′	*Meters.*	*Meters.*
57	00	30.934			1856.03					
	1	4	1	30.94	.03	1	1 856.0	0 1	1 012.9	0.1
	2	4	2	61.87	.04	2	3 712.1	2	2 025.8	0.5
	3	4	3	92.81	.04	3	5 568.1	3	3 038.7	1.1
	4	4	4	123.75	.05	4	7 424.1	4	4 051.6	2.0
57	05	30.934	5	154.68	1856.05	5	9 280.2	0 5	5 064.5	3.1
	6	4	6	185.62	.06	6	11 136.2	6	6 077.4	4.4
	7	4	7	216.55	.06	7	12 992.3	7	7 090.3	6.0
	8	4	8	247.49	.07	8	14 848.4	8	8 103.3	7.9
	9	5	9	278.43	.07	9	16 704.4	9	9 116.2	10.0
57	10	30.935	10	309.36	1856.08	10	18 560.5	0 10	10 129.1	12.4
	11	5	1	340.30	.08	1	20 416.6	15	15 193.6	27.8
	12	5	2	371.24	.09	2	22 272.7	20	20 258.1	49.4
	13	5	3	402.17	.09	3	24 128.7	25	25 322.5	77.2
	14	5	4	433.11	.10	4	25 984.8	30	30 387.0	111.2
57	15	30.935	15	464.04	1856.10	15	27 840.9	0 35	35 451.3	151.3
	16	5	6	494.98	.11	6	29 697.0	40	40 515.6	197.7
	17	5	7	525.92	.11	7	31 553.1	45	45 579.9	250.2
	18	5	8	556.85	.12	8	33 409.3	50	50 644.1	308.9
	19	5	9	587.79	.12	9	35 265.4	55	55 708.2	373.7
57	20	30.935	20	618.73	1856.13	20	37 121.5	1 00	60 772.3	444.8
	21	6	1	649.66	.13	1	38 977.6	05	65 836.2	522.0
	22	6	2	680.60	.14	2	40 833.7	10	70 900.1	605.4
	23	6	3	711.53	.14	3	42 689.9	15	75 963.8	695.0
	24	6	4	742.47	.15	4	44 546.0	20	81 027.5	790.7
57	25	30.936	25	773.41	1856.15	25	46 402.2	1 25	86 091.0	892.6
	26	6	6	804.34	.16	6	48 258.3	30	91 154.3	1 000.7
	27	6	7	835.28	.16	7	50 114.5	35	96 217.6	1 115.0
	28	6	8	866.22	.17	8	51 970.7	40	101 280.7	1 235.5
	29	6	9	897.15	.17	9	53 826.8	45	106 343.6	1 362.1
57	30	30.936	30	928.09	1856.18	30	55 683.0	1 50	111 406.4	1 494.9
	31	6	1	959.02	.18	1	57 539.2	55	116 469.1	1 633.9
	32	6	2	989.96	.19	2	59 395.4	2 00	121 532	1 779
	33	7	3	1 020.90	.19	3	61 251.6	3 00	182 265	4 003
	34	7	4	1 051.83	.20	4	63 107.8	4 00	242 959	7 115
57	35	30.937	35	1 082.77	1856.20	35	64 964.0	5 00	303 601	11 115
	36	7	6	1 113.71	.21	6	66 820.2	6 00	364 178	16 002
	37	7	7	1 144.64	.21	7	68 676.4	7 00	424 677	21 776
	38	7	8	1 175.58	.22	8	70 532.6	8 00	485 085	28 434
	39	7	9	1 206.51	.22	9	72 388.8	9 00	545 389	35 976
57	40	30.937	40	1 237.45	1856.23	40	74 245.0	10 00	605 577	44 400
	41	7	1	1 268.39	.23	1	76 101.3	11 00	665 634	53 704
	42	7	2	1 299.32	.24	2	77 957.5	12 00	725 549	63 886
	43	7	3	1 330.26	.24	3	79 813.7	13 00	785 308	74 944
	44	7	4	1 361.20	.25	4	81 669.9	14 00	844 900	86 875
57	45	30.938	45	1 392.13	1856.25	45	83 526.2	15 00	904 310	99 677
	46	8	6	1 423.07	.26	6	85 382.5	16 00	963 526	113 348
	47	8	7	1 454.00	.26	7	87 238.7	17 00	1 022 536	127 884
	48	8	8	1 484.94	.27	8	89 095.0	18 00	1 081 327	143 282
	49	8	9	1 515.88	.27	9	90 951.2	19 00	1 139 886	159 539
57	50	30.938	50	1 546.81	1856.28	50	92 807.5	20 00	1 198 201	176 651
	51	8	1	1 577.75	.28	1	94 663.8	21 00	1 256 260	194 615
	52	8	2	1 608.69	.29	2	96 520.1	22 00	1 314 048	213 427
	53	8	3	1 639.62	.29	3	98 376.4	23 00	1 371 556	233 082
	54	8	4	1 670.56	.30	4	100 232.7	24 00	1 428 770	253 578
57	55	30.938	55	1 701.49	1856.30	55	102 089.0	25 00	1 485 678	274 908
	56	8	6	1 732.43	.31	6	103 945.3	26 00	1 542 267	297 070
	57	9	7	1 763.37	.31	7	105 801.6	27 00	1 598 525	320 057
	58	9	8	1 794.30	.31	8	107 657.9	28 00	1 654 442	343 865
	59	9	9	1 825.24	.32	9	109 514.2	29 00	1 710 004	368 489
57	60	30.939	60	1 856.18	1856.32	60	111 370.5	30 00	1 765 199	393 924

Latitude 58° to 59°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
58 00	16.426	32.85	49.28	65.71	82.13	98.56	114.98	131.41	147.84	985.6	1971.2	2956.8	3942.3	4927.9
1	.419	.84	.26	.68	.09	.51	.93	.35	.77	5.1	70.3	5.4	40.5	5.6
2	.411	.82	.23	.65	.06	.47	.87	.29	.70	4.7	69.4	4.0	38.7	3.3
3	.403	.81	.21	.61	2.02	.42	.82	.23	.63	4.2	8.4	2.6	6.8	21.0
4	.396	.79	.19	.58	1.98	.38	.77	.17	.56	3.8	7.5	51.3	5.0	18.8
58 05	16.388	32.78	49.16	65.55	81.94	98.33	114.71	131.11	147.49	983.3	1966.6	2949.9	3933.2	4916.5
6	.381	.76	.14	.52	.90	.28	.66	1.04	.42	2.8	5.7	8.5	31.3	4.2
7	.373	.75	.12	.49	.86	.24	.61	0.98	.35	2.4	4.8	7.1	29.5	11.9
8	.365	.73	.10	.46	.83	.19	.56	.92	.29	1.9	3.8	5.8	7.7	09.6
9	.358	.72	.07	.43	.79	.15	.50	.86	.22	1.5	2.9	4.4	5.8	7.3
58 10	16.350	32.70	49.05	65.40	81.75	98.10	114.45	130.80	147.15	981.0	1962.0	2943.0	3924.0	4905.0
11	.342	.68	.03	.37	.71	.05	.40	.74	.08	0.5	1.1	1.6	2.2	2.7
12	.335	.67	9.00	.34	.67	8.01	.34	.68	7.01	80.1	60.2	40.2	20.3	900.4
13	.327	.65	8.98	.31	.64	7.96	.29	.62	6.94	79.6	59.2	38.9	18.5	898.1
14	.319	.64	.96	.28	.60	.92	.23	.56	.87	9.2	8.3	7.5	6.7	5.8
58 15	16.312	32.62	48.93	65.25	81.56	97.87	114.18	130.49	146.81	978.7	1957.4	2936.1	3914.8	4893.5
16	.304	.61	.91	.22	.52	.82	.13	.43	.74	8.2	6.5	4.7	3.0	91.2
17	.296	.59	.89	.19	.48	.78	.07	.37	.67	7.8	5.6	3.4	11.1	88.9
18	.289	.58	.87	.15	.45	.73	4.02	.31	.60	7.3	4.6	2.0	09.3	6.6
19	.281	.56	.84	.12	.41	.69	3.96	.25	.53	6.9	3.7	30.6	7.5	4.3
58 20	16.273	32.55	48.82	65.09	81.37	97.64	113.91	130.19	146.46	976.4	1952.8	2929.2	3905.6	4882.0
21	.266	.53	.80	.06	.33	.59	.86	.13	.39	5.9	1.9	7.8	3.8	79.7
22	.258	.52	.77	.03	.29	.55	.80	.07	.32	5.5	1.0	6.5	2.0	7.4
23	.250	.50	.75	5.00	.25	.50	.75	30.00	.25	5.0	50.0	5.1	900.1	5.1
24	.243	.49	.73	4.97	.21	.46	.70	29.94	.18	4.6	49.1	3.7	898.3	2.8
58 25	16.235	32.47	48.70	64.94	81.18	97.41	113.64	129.88	146.12	974.1	1948.2	2922.3	3896.4	4870.5
26	.227	.45	.68	.91	.14	.36	.59	.82	6.05	3.6	7.3	20.9	4.6	68.2
27	.220	.44	.66	.88	.10	.32	.54	.76	5.98	3.2	6.4	19.6	2.8	5.9
28	.212	.42	.64	.85	.06	.27	.49	.70	.91	2.7	5.4	8.2	90.9	3.6
29	.204	.41	.61	.82	1.02	.23	.43	.64	.84	2.3	4.5	6.8	89.1	61.3
58 30	16.197	32.39	48.59	64.79	80.98	97.18	113.38	129.57	145.77	971.8	1943.6	2915.4	3887.2	4859.0
31	.189	.38	.57	.76	.94	.13	.33	.51	.70	1.3	2.7	4.0	5.4	6.7
32	.181	.36	.54	.73	.90	.09	.27	.45	.63	0.9	1.8	2.7	3.5	4.4
33	.174	.35	.52	.69	.87	.04	.22	.39	.56	0.4	40.8	11.3	81.7	52.1
34	.166	.33	.50	.66	.83	7.00	.16	.33	.49	70.0	39.9	09.9	79.9	49.8
58 35	16.158	32.32	48.47	64.63	80.79	96.95	113.11	129.27	145.43	969.5	1939.0	2908.5	3878.0	4847.5
36	.151	.30	.45	.60	.75	.90	.06	.21	.36	9.0	8.1	7.1	6.2	5.2
37	.143	.29	.43	.57	.71	.86	3.00	.14	.29	8.6	7.2	5.7	4.3	2.9
38	.135	.27	.41	.54	.68	.81	2.95	.08	.22	8.1	6.2	4.4	2.5	40.6
39	.128	.26	.38	.51	.64	.77	.89	9.02	.15	7.7	5.3	3.0	70.6	38.3
58 40	16.120	32.24	48.36	64.48	80.60	96.72	112.84	128.96	145.08	967.2	1934.4	2901.6	3868.8	4836.0
41	.112	.22	.34	.45	.56	.67	.79	.90	5.01	6.7	3.5	900.2	6.9	3.7
42	.105	.21	.31	.42	.52	.63	.73	.84	4.94	6.3	2.6	898.8	5.1	31.4
43	.097	.19	.29	.39	.49	.58	.68	.78	.87	5.8	1.6	7.4	3.3	29.1
44	.089	.18	.27	.36	.45	.54	.62	.71	.80	5.4	30.7	6.1	61.4	6.8
58 45	16.081	32.16	48.24	64.33	80.41	96.49	112.57	128.65	144.73	964.9	1929.8	2894.7	3859.6	4824.4
46	.074	.15	.22	.30	.37	.44	.52	.59	.67	4.4	8.9	3.3	7.7	22.1
47	.066	.13	.20	.27	.33	.40	.46	.53	.60	4.0	8.0	1.9	5.9	19.8
48	.058	.12	.18	.23	.30	.35	.41	.47	.53	3.5	7.0	90.5	4.0	7.5
49	.051	.10	.15	.20	.26	.30	.35	.41	.46	3.0	6.1	89.1	2.2	5.2
58 50	16.043	32.09	48.13	64.17	80.22	96.26	112.30	128.34	144.39	962.6	1925.2	2887.7	3850.3	4812.9
51	.035	.07	.11	.14	.18	.21	.25	.28	.32	2.1	4.3	6.4	48.5	10.6
52	.028	.06	.08	.11	.14	.17	.19	.22	.25	1.7	3.3	5.0	6.6	08.3
53	.020	.04	.06	.08	.10	.12	.14	.16	.18	1.2	2.4	3.6	4.8	6.0
54	.012	.02	.04	.05	.06	.07	.08	.10	.11	0.7	1.4	2.2	2.9	3.7
58 55	16.004	32.01	48.01	64.02	80.02	96.03	112.03	128.04	144.04	960.3	1920.5	2880.8	3841.1	4801.3
56	5.997	1.99	7.99	3.99	79.99	5.98	1.98	7.97	3.97	59.8	19.6	79.4	39.2	799.0
57	.989	.98	.97	.96	.95	.93	.92	.91	.90	9.3	8.7	8.0	7.4	6.7
58	.981	.96	.94	.92	.91	.89	.87	.85	.83	8.9	7.7	6.6	5.5	4.4
59	.974	.95	.92	.89	.87	.84	.81	.79	.76	8.4	6.8	5.3	3.7	92.1
58 60	15.966	31.93	47.90	63.86	79.83	95.80	111.76	127.73	143.69	958.0	1915.9	2873.9	3831.8	4789.8

Lat.		Latitude 58° to 59°—Meridional arcs.						Latitude 58°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 58° 30′		Value of 1′	Continuous sums of minutes from latitude 58° 00′		Longitude.	X	Y
°	′	Meters.	″	Meters.	Meters.	′	Meters.	° ′	Meters.	Meters.
58	00	30.939			1856.32					
	1	9	1	30.94	.33	1	1 856.3	0 1	985.6	0.1
	2	9	2	61.88	.33	2	3 712.7	2	1 971.2	0.5
	3	9	3	92.82	.34	3	5 569.0	3	2 956.8	1.1
	4	9	4	123.76	.34	4	7 425.3	4	3 942.3	1.9
58	05	30.939	5	154.71	1856.35	5	9 281.7	0 5	4 927.9	3.0
	6	9	6	185.65	.35	6	11 138.0	6	5 913.5	4.4
	7	9	7	216.59	.36	7	12 994.4	7	6 899.1	6.0
	8	9	8	247.53	.36	8	14 850.7	8	7 884.7	7.8
	9	39	9	278.47	.37	9	16 707.1	9	8 870.3	9.8
58	10	30.940	10	309.41	1856.37	10	18 563.5	0 10	9 855.8	12.2
	11	0	1	340.35	.38	11	20 419.9	15	14 783.7	27.4
	12	0	2	371.29	.38	12	22 276.2	20	19 711.6	48.6
	13	0	3	402.24	.39	13	24 132.6	25	24 639.5	76.0
	14	0	4	433.18	.39	14	25 989.0	30	29 567.3	109.4
58	15	30.940	15	464.12	1856.40	15	27 845.4	0 35	34 495.0	148.9
	16	0	6	495.06	.40	16	29 701.8	40	39 422.8	194.5
	17	0	7	526.00	.41	17	31 558.2	45	44 350.4	246.2
	18	0	8	556.94	.41	18	33 414.6	50	49 278.0	303.9
	19	0	9	587.88	.42	19	35 271.0	55	54 205.5	367.7
58	20	30.940	20	618.82	1856.42	20	37 127.5	1 00	59 132.9	437.6
	21	0	1	649.77	.43	21	38 983.9	05	64 060.2	513.6
	22	1	2	680.71	.43	22	40 840.3	10	68 987.5	595.6
	23	1	3	711.65	.44	23	42 696.8	15	73 914.7	683.8
	24	1	4	742.59	.44	24	44 553.2	20	78 841.7	778.0
58	25	30.941	25	773.53	1856.45	25	46 409.6	1 25	83 768.6	878.3
	26	1	6	804.47	.45	26	48 266.1	30	88 695.4	984.6
	27	1	7	835.41	.46	27	50 122.6	35	93 622.0	1 097.1
	28	1	8	866.35	.46	28	51 979.0	40	98 548.5	1 215.6
	29	1	9	897.30	.47	29	53 835.5	45	103 474.8	1 340.2
58	30	30.941	30	928.24	1856.47	30	55 692.0	1 50	108 401.0	1 470.8
	31	1	1	959.18	.48	31	57 548.4	55	113 327.1	1 607.6
	32	1	2	990.12	.48	32	59 404.9	2 00	118 253	1 750
	33	1	3	1 021.06	.49	33	61 261.4	3 00	177 347	3 938
	34	2	4	1 052.00	.49	34	63 117.9	4 00	236 402	7 000
58	35	30.942	35	1 082.94	1856.50	35	64 974.4	5 00	295 406	10 936
	36	2	6	1 113.88	.50	36	66 830.9	6 00	354 344	15 744
	37	2	7	1 144.83	.51	37	68 687.4	7 00	413 205	21 425
	38	2	8	1 175.77	.51	38	70 543.9	8 00	471 976	27 976
	39	2	9	1 206.71	.52	39	72 400.4	9 00	530 643	35 396
58	40	30.942	40	1 237.65	1856.52	40	74 256.9	10 00	589 194	43 684
	41	2	1	1 268.59	.53	41	76 113.5	11 00	647 616	52 837
	42	2	2	1 299.53	.53	42	77 970.0	12 00	705 896	62 854
	43	2	3	1 330.47	.54	43	79 826.5	13 00	764 021	73 733
	44	2	4	1 361.41	.54	44	81 683.1	14 00	821 979	85 470
58	45	30.942	45	1 392.35	1856.55	45	83 539.6	15 00	879 757	98 064
	46	3	6	1 423.30	.55	46	85 396.2	16 00	937 342	111 512
	47	3	7	1 454.24	.56	47	87 252.7	17 00	994 722	125 811
	48	3	8	1 485.18	.56	48	89 109.3	18 00	1 051 884	140 957
	49	3	9	1 516.12	.57	49	90 965.8	19 00	1 108 815	156 948
58	50	30.943	50	1 547.06	1856.57	50	92 822.4	20 00	1 165 504	173 780
	51	3	1	1 578.00	.58	51	94 679.0	21 00	1 221 937	191 449
	52	3	2	1 608.94	.58	52	96 535.6	22 00	1 278 103	209 951
	53	3	3	1 639.88	.59	53	98 392.1	23 00	1 333 988	229 282
	54	3	4	1 670.83	.59	54	100 248.7	24 00	1 389 581	249 439
58	55	30.943	55	1 701.77	1856.59	55	102 105.3	25 00	1 444 870	270 416
	56	3	6	1 732.71	.60	56	103 961.9	26 00	1 499 843	292 209
	57	3	7	1 763.65	.60	57	105 818.5	27 00	1 554 486	314 813
	58	3	8	1 794.59	.61	58	107 675.1	28 00	1 608 789	338 224
	59	4	9	1 825.53	.61	59	109 531.8	29 00	1 662 740	362 436
58	60	30.944	60	1 856.47	1856.62	60	111 388.4	30 00	1 716 327	387 443

Latitude 59° to 60°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
59 00	15.966	31.93	47.90	63.86	79.83	95.80	111.76	127.73	143.69	958.0	1915.9	2873.9	3831.8	4789.8
1	.958	.92	.88	.83	.79	.75	.71	.67	.62	7.5	5.0	2.5	30.0	7.5
2	.951	.90	.85	.80	.75	.70	.65	.61	.55	7.0	4.1	71.1	28.1	5.2
3	.943	.89	.83	.77	.71	.66	.60	.55	.48	6.6	3.1	69.7	6.3	2.8
4	.935	.87	.81	.74	.67	.61	.54	.48	.41	6.1	2.2	8.3	4.4	80.5
59 05	15.927	31.85	47.78	63.71	79.63	95.56	111.49	127.42	143.34	955.6	1911.3	2866.9	3822.6	4778.2
6	.920	.84	.76	.67	.60	.52	.44	.36	.28	5.2	10.4	5.5	20.7	5.9
7	.912	.82	.74	.65	.56	.47	.38	.30	.21	4.7	09.5	4.1	18.9	3.6
8	.904	.81	.71	.62	.52	.43	.33	.23	.14	4.3	8.5	2.8	7.0	71.3
9	.896	.79	.69	.58	.48	.38	.27	.17	.07	3.8	7.6	1.4	5.1	68.9
59 10	15.889	31.78	47.67	63.55	79.44	95.33	111.22	127.11	143.00	953.3	1906.7	2860.0	3813.3	4766.6
11	.881	.76	.64	.52	.40	.29	.17	7.05	2.93	2.9	5.8	58.6	11.4	4.3
12	.873	.75	.62	.49	.36	.24	.11	6.99	.86	2.4	4.8	7.2	09.6	62.0
13	.866	.73	.60	.46	.33	.19	.06	.92	.79	1.9	3.9	5.8	7.7	59.7
14	.858	.72	.57	.43	.29	.15	1.00	.86	.72	1.5	2.9	4.4	5.9	7.3
59 15	15.850	31.70	47.55	63.40	79.25	95.10	110.95	126.80	142.65	951.0	1902.0	2853.0	3804.0	4755.0
16	.842	.68	.53	.37	.21	.05	.90	.74	.58	0.5	1.1	1.6	2.2	2.7
17	.835	.67	.50	.34	.17	5.00	.84	.68	.51	50.1	900.2	50.2	800.3	50.4
18	.827	.65	.48	.31	.14	4.95	.79	.61	.44	49.6	899.2	48.8	798.4	48.1
19	.819	.64	.46	.28	.10	.91	.73	.55	.37	9.1	8.3	7.4	6.6	5.7
59 20	15.811	31.62	47.43	63.25	79.06	94.87	110.68	126.49	142.30	948.7	1897.4	2846.0	3794.7	4743.4
21	.804	.61	.41	.22	9.02	.82	.63	.43	.23	8.2	6.5	4.6	2.9	41.1
22	.796	.59	.39	.19	8.98	.78	.57	.37	.16	7.8	5.5	3.3	91.0	38.8
23	.788	.58	.36	.15	.94	.73	.52	.30	.09	7.3	4.6	1.9	89.2	6.4
24	.780	.56	.34	.12	.90	.68	.46	.24	2.02	6.8	3.6	40.5	7.3	4.1
59 25	15.773	31.55	47.32	63.09	78.87	94.64	110.41	126.18	141.96	946.4	1892.7	2839.1	3785.4	4731.8
26	.765	.53	.29	.06	.83	.59	.36	.12	.89	5.9	1.8	7.7	3.6	29.5
27	.757	.52	.27	.03	.79	.54	.30	6.06	.82	5.4	90.9	6.3	81.7	7.1
28	.749	.50	.25	3.00	.75	.50	.25	5.99	.75	5.0	89.9	4.9	79.8	4.8
29	.742	.49	.22	2.97	.71	.45	.19	.93	.68	4.5	9.0	3.5	8.0	2.5
59 30	15.734	31.47	47.20	62.94	78.67	94.40	110.14	125.87	141.61	944.0	1888.1	2832.1	3776.1	4720.2
31	.726	.45	.18	.91	.63	.36	.09	.81	.54	3.6	7.2	30.7	4.3	17.8
32	.718	.44	.15	.87	.59	.31	.03	.75	.47	3.1	6.2	29.3	2.4	5.5
33	.711	.42	.13	.84	.55	.26	09.98	.68	.40	2.6	5.3	7.9	70.5	3.2
34	.703	.41	.11	.81	.51	.22	09.92	.62	.33	2.2	4.3	6.5	68.7	10.8
59 35	15.695	31.39	47.08	62.78	78.48	94.17	109.87	125.56	141.26	941.7	1883.4	2825.1	3766.8	4708.5
36	.687	.38	.06	.75	.44	.12	.81	.50	.19	1.2	2.5	3.7	4.9	6.2
37	.680	.36	.04	.72	.40	.08	.76	.44	.12	0.8	1.6	2.3	3.1	3.9
38	.672	.34	7.02	.68	.36	4.03	.70	.37	1.05	40.3	80.6	20.9	61.2	701.5
39	.664	.33	6.99	.65	.32	3.98	.64	.31	0.97	39.8	79.7	19.5	59.4	699.2
59 40	15.656	31.31	46.97	62.62	78.28	93.94	109.59	125.25	140.91	939.4	1878.8	2818.1	3757.5	4696.9
41	.648	.30	.95	.59	.24	.89	.54	.19	.84	8.9	7.8	6.7	5.6	4.5
42	.641	.28	.92	.56	.20	.84	.48	.13	.77	8.4	6.9	5.3	3.8	92.2
43	.633	.27	.90	.53	.17	.80	.43	.06	.70	8.0	6.0	3.9	1.9	89.9
44	.625	.25	.88	.50	.12	.75	.37	5.00	.63	7.5	5.0	2.5	50.0	7.5
59 45	15.617	31.23	46.85	62.47	78.09	93.70	109.32	124.94	140.56	937.0	1874.1	2811.1	3748.2	4685.2
46	.610	.22	.83	.44	.05	.66	.27	.88	.49	6.6	3.2	09.7	6.3	2.9
47	.602	.20	.81	.40	8.01	.61	.21	.81	.42	6.1	2.2	8.3	4.4	80.5
48	.594	.19	.78	.38	7.97	.56	.16	.75	.35	5.6	1.3	6.9	2.6	78.2
49	.586	.17	.76	.34	.93	.52	.10	.69	.28	5.2	70.3	5.5	40.7	5.9
59 50	15.579	31.16	46.74	62.31	77.89	93.47	109.05	124.63	140.21	934.7	1869.4	2804.1	3738.8	4673.6
51	.571	.14	.71	.28	.85	.42	9.00	.57	.14	4.2	8.5	02.7	7.0	71.2
52	.563	.13	.69	.25	.81	.38	8.94	.50	.07	3.8	7.5	801.3	5.1	68.9
53	.555	.11	.67	.22	.77	.33	.89	.44	40.00	3.3	6.6	799.9	3.2	6.5
54	.547	.09	.64	.18	.73	.28	.83	.37	39.92	2.8	5.7	8.5	31.4	4.2
59 55	15.540	31.08	46.62	62.15	77.70	93.24	108.78	124.31	139.86	932.4	1864.7	2797.1	3729.5	4661.9
56	.532	.06	.60	.12	.66	.19	.72	.25	.79	1.9	3.8	5.7	7.6	59.5
57	.524	.05	.57	.09	.62	.14	.67	.19	.72	1.4	2.9	4.3	5.8	7.2
58	.516	.03	.55	.06	.58	.10	.61	.13	.65	1.0	1.9	2.9	3.9	4.9
59	.508	.02	.52	.03	.54	.05	.56	.07	.58	0.5	1.0	1.5	2.0	2.5
59 60	15.501	31.00	46.50	62.00	77.50	93.00	108.50	124.00	139.51	930.0	1860.1	2790.1	3720.1	4650.2

Lat.		Latitude 59° to 60°—Meridional arcs.						Latitude 59°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 59° 30′		Value of 1′	Continuous sums of minutes from latitude 59° 00′		Longitude.	X	Y
°	′	*Meters.*	″	*Meters.*	*Meters.*	′	*Meters.*	° ′	*Meters.*	*Meters.*
59	00	30.944			1856.62					
	1	4	1	30.95	.62	1	1 856.6	0 1	958.0	0.1
	2	4	2	61.89	.63	2	3 713.2	2	1 915.9	0.5
	3	4	3	92.84	.63	3	5 569.9	3	2 873.9	1.1
	4	4	4	123.78	.64	4	7 426.5	4	3 831.9	1.9
59	05	30.944	5	154.73	1856.64	5	9 283.2	0 5	4 789.8	3.0
	6	4	6	185.68	.65	6	11 139.8	6	5 747.7	4.3
	7	4	7	216.62	.65	7	12 996.4	7	6 705.7	5.9
	8	4	8	247.57	.66	8	14 853.1	8	7 663.7	7.6
	9	4	9	278.51	.66	9	16 709.8	9	8 621.6	9.7
59	10	30.944	10	309.46	1856.67	10	18 566.4	0 10	9 579.6	11.9
	11	5	1	340.41	.67	1	20 423.1	15	14 369.3	26.9
	12	5	2	371.35	.68	2	22 279.8	20	19 159.1	47.8
	13	5	3	402.30	.68	3	24 136.5	25	23 948.8	74.6
	14	5	4	433.25	.69	4	25 993.1	30	28 738.5	107.5
59	15	30.945	15	464.19	1856.69	15	27 849.8	0 35	33 528.1	146.3
	16	5	6	495.14	.70	6	29 706.5	40	38 317.7	191.1
	17	5	7	526.08	.70	7	31 563.2	45	43 107.2	241.8
	18	5	8	557.03	.71	8	33 419.9	50	47 896.7	298.6
	19	5	9	587.98	.71	9	35 276.6	55	52 686.1	361.2
59	20	30.945	20	618.92	1856.72	20	37 133.4	1 00	57 475.4	429.9
	21	5	1	649.87	.72	1	38 990.1	05	62 264.6	504.5
	22	5	2	680.81	.73	2	40 846.8	10	67 053.7	585.2
	23	6	3	711.76	.73	3	42 703.5	15	71 842.7	671.7
	24	6	4	742.71	.74	4	44 560.3	20	76 631.6	764.3
59	25	30.946	25	773.65	1856.74	25	46 417.0	1 25	81 420.4	862.8
	26	6	6	804.60	.75	6	48 273.7	30	86 209.0	967.3
	27	6	7	835.54	.75	7	50 130.5	35	90 997.5	1 077.8
	28	6	8	866.49	.75	8	51 987.2	40	95 785.9	1 194.2
	29	6	9	897.44	.76	9	53 844.0	45	100 574.1	1 316.6
59	30	30.946	30	928.38	1856.76	30	55 700.8	1 50	105 362.2	1 445.0
	31	6	1	959.33	.77	1	57 557.5	55	110 150.1	1 579.3
	32	6	2	990.27	.77	2	59 414.3	2 00	114 938	1 720
	33	6	3	1 021.22	.78	3	61 271.1	3 00	172 375	3 869
	34	6	4	1 052.17	.78	4	63 127.9	4 00	229 773	6 877
59	35	30.946	35	1 083.11	1856.79	35	64 984.6	5 00	287 120	10 744
	36	7	6	1 114.06	.79	6	66 841.4	6 00	344 402	15 468
	37	7	7	1 145.00	.80	7	68 698.2	7 00	401 608	21 048
	38	7	8	1 175.95	.80	8	70 555.0	8 00	458 723	27 484
	39	7	9	1 206.90	.81	9	72 411.8	9 00	515 736	34 773
59	40	30.947	40	1 237.84	1856.81	40	74 268.7	10 00	572 633	42 914
	41	7	1	1 268.79	.82	1	76 125.5	11 00	629 403	51 906
	42	7	2	1 299.74	.82	2	77 982.3	12 00	686 031	61 746
	43	7	3	1 330.68	.83	3	79 839.1	13 00	742 506	72 432
	44	7	4	1 361.63	.83	4	81 695.9	14 00	798 815	83 961
59	45	30.947	45	1 392.57	1856.84	45	83 552.8	15 00	854 945	96 332
	46	7	6	1 423.52	.84	6	85 409.6	16 00	910 883	109 541
	47	7	7	1 454.47	.85	7	87 266.5	17 00	966 618	123 585
	48	8	8	1 485.41	.85	8	89 123.3	18 00	1 022 136	138 462
	49	8	9	1 516.36	.86	9	90 980.2	19 00	1 077 426	154 167
59	50	30.948	50	1 547.30	1856.86	50	92 837.0	20 00	1 132 474	170 698
	51	8	1	1 578.25	.87	1	94 693.9	21 00	1 187 269	188 050
	52	8	2	1 609.20	.87	2	96 550.8	22 00	1 241 799	206 221
	53	8	3	1 640.14	.88	3	98 407.6	23 00	1 296 050	225 205
	54	8	4	1 671.09	.88	4	100 264.5	24 00	1 350 011	244 998
59	55	30.948	55	1 702.03	1856.88	55	102 121.4	25 00	1 403 671	265 597
	56	8	6	1 732.98	.89	6	103 978.3	26 00	1 457 015	286 995
	57	8	7	1 763.93	.89	7	105 835.2	27 00	1 510 034	309 190
	58	8	8	1 794.87	.90	8	107 692.1	28 00	1 562 715	332 175
	59	8	9	1 825.82	.90	9	109 549.0	29 00	1 615 047	355 946
59	60	30.948	60	1 856.76	1856.91	60	111 405.9	30 00	1 667 016	380 497

Latitude 60° to 61°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
60 00	15.501	31.00	46.50	62.00	77.50	93.00	108.50	124.00	139.51	930.0	1860.1	2790.1	3720.1	4650.2
1	.493	0.99	.48	1.97	.46	92.96	.45	123.94	.44	29.6	59.2	88.7	18.3	47.8
2	.485	.97	.45	.94	.42	.91	.39	.88	.37	9.1	8.2	7.3	6.4	5.5
3	.477	.96	.43	.91	.38	.86	.34	.81	.30	8.6	7.3	5.9	4.5	3.2
4	.469	.94	.41	.88	.34	.82	.28	.75	.23	8.2	6.3	4.5	2.6	40.8
60 05	15.462	30.92	46.38	61.84	77.31	92.77	108.23	123.69	139.15	927.7	1855.4	2783.1	3710.8	4638.5
6	.454	.91	.36	.81	.27	.72	.18	.63	.08	7.2	4.5	1.7	08.9	6.1
7	.446	.89	.34	.78	.23	.68	.12	.57	9.01	6.8	3.5	80.3	7.0	3.8
8	.438	.88	.31	.75	.19	.63	.07	.50	8.94	6.3	2.6	78.9	5.2	1.4
9	.430	.86	.29	.72	.15	.58	8.01	.44	.87	5.8	1.6	7.5	3.3	29.1
60 10	15.423	30.85	46.27	61.69	77.11	92.54	107.96	123.38	138.80	925.4	1850.7	2776.1	3701.4	4626.8
11	.415	.83	.24	.66	.07	.49	.91	.32	.73	4.9	49.8	4.7	699.5	4.4
12	.407	.81	.22	.63	7.03	.44	.85	.26	.66	4.4	8.8	3.2	7.7	22.1
13	.399	.80	.20	.60	6.99	.39	.80	.19	.59	3.9	7.9	1.8	5.8	19.7
14	.391	.79	.17	.57	.95	.35	.74	.13	.52	3.5	6.9	70.4	3.9	7.4
60 15	15.383	30.77	46.15	61.53	76.92	92.30	107.69	123.07	138.45	923.0	1846.0	2769.0	3692.0	4615.0
16	.376	.75	.13	.50	.88	.25	.63	3.01	.38	2.5	5.1	7.6	90.2	2.7
17	.368	.74	.10	.47	.84	.21	.58	2.94	.31	2.1	4.1	6.2	88.3	10.4
18	.360	.72	.08	.44	.80	.16	.52	.88	.24	1.6	3.2	4.8	6.4	08.0
19	.352	.70	.06	.41	.76	.11	.47	.82	.17	1.1	2.2	3.4	4.5	5.7
60 20	15.344	30.69	46.03	61.38	76.72	92.07	107.41	122.76	138.10	920.7	1841.3	2762.0	3682.7	4603.3
21	.337	.67	6.01	.35	.68	2.02	.36	.70	8.03	0.2	40.4	60.6	80.8	601.0
22	.329	.66	5.99	.32	.64	1.97	.30	.63	7.96	19.7	39.4	59.2	78.9	598.6
23	.321	.64	.96	.28	.60	.93	.25	.57	.89	9.3	8.5	7.8	7.0	6.3
24	.313	.63	.94	.25	.56	.88	.19	.51	.82	8.8	7.5	6.4	5.1	3.9
60 25	15.305	30.61	45.92	61.22	76.53	91.83	107.14	122.44	137.75	918.3	1836.6	2754.9	3673.3	4591.6
26	.297	.59	.89	.19	.49	.78	.08	.38	.67	7.8	5.7	3.5	71.4	89.2
27	.290	.58	.87	.16	.45	.74	7.03	.32	.60	7.4	4.7	2.1	69.5	6.9
28	.282	.56	.85	.12	.41	.69	6.97	.25	.53	6.9	3.8	50.7	7.6	4.5
29	.274	.55	.82	.09	.37	.64	.92	.19	.46	6.4	2.8	49.3	5.7	82.2
60 30	15.266	30.53	45.80	61.06	76.33	91.60	106.86	122.13	137.39	916.0	1831.9	2747.9	3663.9	4579.8
31	.258	.51	.78	.03	.29	.55	.81	.07	.32	5.5	1.0	6.5	2.0	7.5
32	.250	.50	.75	1.00	.25	.50	.75	2.00	.25	5.0	30.0	5.1	60.1	5.1
33	.243	.48	.73	0.97	.21	.46	.70	1.94	.18	4.6	29.1	3.7	58.2	2.8
34	.235	.47	.70	.94	.17	.41	.64	.88	.11	4.1	8.1	2.3	6.3	70.4
60 35	15.227	30.45	45.68	60.91	76.14	91.36	106.59	121.82	137.04	913.6	1827.2	2740.8	3654.5	4568.1
36	.219	.44	.66	.87	.10	.31	.53	.75	6.97	3.1	6.3	39.4	2.6	5.7
37	.211	.42	.63	.84	.06	.27	.48	.69	.90	2.7	5.4	8.0	50.7	3.4
38	.203	.41	.61	.81	6.02	.22	.42	.63	.83	2.2	4.4	6.6	48.8	61.0
39	.196	.39	.59	.78	5.98	.17	.37	.56	.76	1.7	3.4	5.2	6.9	58.7
60 40	15.188	30.38	45.56	60.75	75.94	91.13	106.31	121.50	136.69	911.3	1822.5	2733.8	3645.0	4556.3
41	.180	.36	.54	.72	.90	.08	.26	.44	.62	0.8	1.6	2.4	3.2	4.0
42	.172	.35	.52	.69	.86	1.03	.20	.37	.55	10.3	20.6	31.0	41.3	51.6
43	.164	.33	.49	.66	.82	0.98	.15	.31	.48	09.8	19.7	29.5	39.4	49.2
44	.156	.32	.47	.63	.78	.94	.09	.25	.41	9.4	8.8	8.1	7.5	6.9
60 45	15.148	30.30	45.44	60.59	75.75	90.89	106.04	121.18	136.33	908.9	1817.8	2726.7	3635.6	4544.5
46	.141	.28	.42	.56	.71	.84	5.98	.12	.26	8.4	6.9	5.3	3.8	42.2
47	.133	.27	.40	.53	.67	.80	.93	.06	.19	8.0	5.9	3.9	1.8	39.8
48	.125	.25	.38	.50	.63	.75	.87	1.00	.12	7.5	5.0	2.5	30.0	7.5
49	.117	.24	.35	.47	.59	.70	.82	0.93	6.05	7.0	4.0	21.1	28.1	5.1
60 50	15.109	30.22	45.33	60.44	75.55	90.65	105.76	120.87	135.98	906.5	1813.1	2719.6	3626.2	4532.7
51	.101	.20	.30	.41	.51	.61	.71	.81	.91	6.1	2.2	8.2	4.3	30.4
52	.093	.19	.28	.37	.47	.56	.65	.75	.84	5.6	1.2	6.8	2.4	28.0
53	.086	.17	.26	.34	.43	.51	.60	.68	.77	5.1	10.3	5.4	20.6	5.7
54	.078	.16	.23	.31	.39	.47	.54	.62	.70	4.7	09.3	4.0	18.6	3.3
60 55	15.070	30.14	45.21	60.28	75.35	90.42	105.49	120.55	135.62	904.2	1808.4	2712.5	3616.7	4520.9
56	.062	.12	.19	.25	.31	.37	.43	.49	.56	3.7	7.4	11.2	4.9	18.6
57	.054	.11	.16	.22	.27	.32	.38	.43	.48	3.2	6.5	09.7	3.0	6.2
58	.046	.09	.14	.18	.23	.28	.32	.37	.41	2.8	5.6	8.3	11.1	3.9
59	.038	.08	.11	.15	.19	.23	.27	.30	.34	2.3	4.6	6.9	09.2	11.5
60 00	15.030	30.06	45.09	60.12	75.15	90.18	105.21	120.24	135.27	901.8	1803.7	2705.5	3607.3	4509.1

Lat.		Latitude 60° to 61°—Meridional arcs.						Latitude 60°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 60° 30′		Value of 1′	Continuous sums of minutes from latitude 60° 00′		Longitude.	X	Y
°	′	*Meters.*	″	*Meters.*	*Meters.*	′	*Meters.*	° ′	*Meters.*	*Meters.*
60	00	30.948			1856.91					
	1	9	1	30.95	.91	1	1 856.9	0 1	930.0	0.1
	2	9	2	61.90	.92	2	3 713.8	2	1 860.1	0.5
	3	9	3	92.85	.92	3	5 570.7	3	2 790.1	1.1
	4	9	4	123.80	.93	4	7 427.7	4	3 720.2	1.9
60	05	30.949	5	154.75	1856.93	5	9 284.6	0 5	4 650.2	2.9
	6	9	6	185.71	.94	6	11 141.5	6	5 580.2	4.2
	7	9	7	216.66	.94	7	12 998.5	7	6 510.3	5.7
	8	9	8	247.61	.95	8	14 855.4	8	7 440.3	7.5
	9	9	9	278.56	.95	9	16 712.4	9	8 370.4	9.5
60	10	30.949	10	309.51	1856.96	10	18 569.3	0 10	9 300.4	11.7
	11	9	1	340.46	.96	1	20 426.3	15	13 950.5	26.4
	12	49	2	371.41	.97	2	22 283.2	20	18 600.6	46.9
	13	50	3	402.36	.97	3	24 140.2	25	23 250.7	73.2
	14	0	4	433.31	.98	4	25 997.2	30	27 900.8	105.4
60	15	30.950	15	464.26	1856.98	15	27 854.2	0 35	32 550.8	143.5
	16	0	6	495.21	.98	6	29 711.1	40	37 200.8	187.4
	17	0	7	526.16	.99	7	31 568.1	45	41 850.7	237.2
	18	0	8	557.12	6.99	8	33 425.1	50	46 500.6	292.8
	19	0	9	588.07	7.00	9	35 282.1	55	51 150.3	354.3
60	20	30.950	20	619.02	1857.00	20	37 139.1	1 00	55 800.0	421.7
	21	0	1	649.97	.01	1	38 996.1	05	60 449.6	494.9
	22	0	2	680.92	.01	2	40 853.1	10	65 099.2	574.0
	23	0	3	711.87	.02	3	42 710.1	15	69 738.6	658.9
	24	0	4	742.82	.02	4	44 567.2	20	74 397.9	749.7
60	25	30.950	25	773.77	1857.03	25	46 424.2	1 25	79 047.0	846.4
	26	1	6	804.72	.03	6	48 281.2	30	83 696.1	948.8
	27	1	7	835.67	.04	7	50 138.2	35	88 345.0	1 057.1
	28	1	8	866.62	.04	8	51 995.3	40	92 993.8	1 171.3
	29	1	9	897.57	.05	9	53 852.3	45	97 642.4	1 291.3
60	30	30.951	30	928.53	1857.05	30	55 709.4	1 50	102 290.9	1 417.2
	31	1	1	959.48	.06	1	57 566.4	55	106 939.2	1 549.0
	32	1	2	990.43	.06	2	59 423.5	2 00	111 587	1 687
	33	1	3	1 021.38	.07	3	61 280.6	3 00	167 349	3 795
	34	1	4	1 052.33	.07	4	63 137.6	4 00	223 073	6 745
60	35	30.951	35	1 083.28	1857.07	35	64 994.7	5 00	278 745	10 538
	36	1	6	1 114.23	.08	6	66 851.8	6 00	334 354	15 172
	37	1	7	1 145.18	.08	7	68 708.9	7 00	389 887	20 645
	38	1	8	1 176.13	.09	8	70 566.0	8 00	445 330	26 957
	39	2	9	1 207.08	.09	9	72 423.1	9 00	500 672	34 107
60	40	30.952	40	1 238.03	1857.10	40	74 280.1	10 00	555 899	42 092
	41	2	1	1 268.98	.10	1	76 137.2	11 00	611 000	50 911
	42	2	2	1 299.94	.11	2	77 994.4	12 00	665 961	60 562
	43	2	3	1 330.89	.11	3	79 851.5	13 00	720 769	71 043
	44	2	4	1 361.84	.12	4	81 708.6	14 00	775 413	82 350
60	45	30.952	45	1 392.79	1857.12	45	83 565.7	15 00	829 880	94 482
	46	2	6	1 423.74	.13	6	85 422.8	16 00	884 157	107 436
	47	2	7	1 454.69	.13	7	87 280.0	17 00	938 232	121 209
	48	2	8	1 485.64	.14	8	89 137.1	18 00	992 093	135 798
	49	2	9	1 516.59	.14	9	90 994.2	19 00	1 045 727	151 199
60	50	30.952	50	1 547.54	1857.15	50	92 851.4	20 00	1 099 123	167 409
	51	3	1	1 578.49	.15	1	94 708.5	21 00	1 152 267	184 424
	52	3	2	1 609.44	.15	2	96 565.7	22 00	1 205 148	202 241
	53	3	3	1 640.40	.16	3	98 422.8	23 00	1 257 753	220 854
	54	3	4	1 671.35	.16	4	100 280.0	24 00	1 310 072	240 261
60	55	30.953	55	1 702.30	1857.17	55	102 137.2	25 00	1 362 091	260 456
	56	3	6	1 733.25	.17	6	103 994.3	26 00	1 413 798	281 436
	57	3	7	1 764.20	.18	7	105 851.5	27 00	1 465 183	303 194
	58	3	8	1 795.15	.18	8	107 708.7	28 00	1 516 233	325 726
	59	3	9	1 826.10	.19	9	109 565.9	29 00	1 566 937	349 028
60	60	30.953	60	1 857.05	1857.19	60	111 423.1	30 00	1 617 283	373 093

Latitude 61° to 62°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
61 00	15.030	30.06	45.09	60.12	75.15	90.18	105.21	120.24	135.27	901.8	1803.7	2705.5	3607.3	4509.1
1	.023	.05	.07	.09	.11	.14	.16	.18	.20	1.4	2.7	4.1	5.4	6.8
2	.015	.03	.04	.06	.07	.09	.10	.12	.13	0.9	1.8	2.6	3.5	4.4
3	.007	.01	.02	.03	5.03	90.04	5.05	20.05	5.06	900.4	800.8	701.2	601.6	502.0
4	4.999	30.00	5.00	60.00	4.99	89.99	4.99	19.99	4.99	899.9	799.9	699.8	599.7	499.7
61 05	14.991	29.98	44.97	59.96	74.96	89.95	104.94	119.93	134.91	899.5	1798.9	2698.4	3597.9	4497.3
6	.983	.97	.95	.93	.92	.90	.88	.87	.85	9.0	8.0	7.0	6.0	5.0
7	.975	.95	.93	.90	.88	.85	.83	.80	.78	8.5	7.0	5.6	4.1	2.6
8	.967	.93	.90	.87	.84	.80	.77	.74	.70	8.0	6.1	4.1	2.2	90.2
9	.960	.92	.88	.84	.80	.76	.72	.67	.63	7.6	5.1	2.7	90.3	87.9
61 10	14.952	29.90	44.85	59.81	74.76	89.71	104.66	119.61	134.56	897.1	1794.2	2691.3	3588.4	4485.5
11	.944	.89	.83	.78	.72	.66	.61	.55	.49	6.6	3.3	89.9	6.5	3.1
12	.936	.87	.81	.74	.68	.62	.55	.49	.42	6.2	2.3	8.5	4.6	80.8
13	.928	.86	.78	.71	.64	.57	.50	.42	.35	5.7	1.4	7.0	2.7	78.4
14	.920	.84	.76	.68	.60	.52	.44	.36	.28	5.2	90.4	5.6	80.8	6.0
61 15	14.912	29.82	44.74	59.65	74.56	89.47	104.39	119.30	134.21	894.7	1789.5	2684.2	3578.9	4473.6
16	.904	.81	.71	.62	.52	.43	.33	.23	.14	4.3	8.5	2.8	7.0	71.3
17	.896	.79	.69	.59	.48	.38	.28	.17	4.06	3.8	7.6	81.3	5.1	68.9
18	.888	.78	.67	.55	.44	.33	.22	.11	3.99	3.3	6.6	79.9	3.2	6.5
19	.881	.76	.64	.52	.40	.28	.17	9.04	.92	2.8	5.7	8.5	71.3	4.2
61 20	14.873	29.75	44.62	59.49	74.36	89.24	104.11	118.98	133.85	892.4	1784.7	2677.1	3569.4	4461.8
21	.865	.73	.59	.46	.32	.19	.06	.92	.78	1.9	3.8	5.7	7.5	59.4
22	.857	.71	.57	.43	.28	.14	4.00	.85	.71	1.4	2.8	4.2	5.6	7.1
23	.849	.70	.55	.40	.24	.09	3.95	.79	.64	0.9	1.9	2.8	3.7	4.7
24	.841	.68	.52	.36	.20	.05	.89	.73	.57	0.5	0.9	1.4	1.9	52.3
61 25	14.833	29.67	44.50	59.33	74.17	89.00	103.84	118.67	133.50	890.0	1780.0	2670.0	3560.0	4449.9
26	.825	.65	.48	.30	.13	8.95	.78	.60	.43	89.5	79.0	68.6	58.1	7.6
27	.817	.63	.45	.27	.09	.90	.72	.54	.35	9.0	8.1	7.1	6.2	5.2
28	.809	.62	.43	.24	.05	.86	.67	.48	.28	8.6	7.1	5.7	4.3	2.8
29	.802	.60	.40	.21	4.01	.81	.62	.41	.21	8.1	6.2	4.3	2.4	40.5
61 30	14.794	29.59	44.38	59.17	73.97	88.76	103.56	118.35	133.14	887.6	1775.2	2662.9	3550.5	4438.1
31	.786	.57	.36	.14	.93	.71	.50	.29	.07	7.1	4.3	1.4	48.6	5.7
32	.778	.56	.33	.11	.89	.67	.45	.22	3.00	6.7	3.3	60.0	6.7	3.3
33	.770	.54	.31	.08	.85	.62	.39	.16	2.93	6.2	2.4	58.6	4.8	31.0
34	.762	.52	.29	.05	.81	.57	.34	.10	.86	5.7	1.4	7.1	2.9	28.6
61 35	14.754	29.51	44.26	59.02	73.77	88.52	103.28	118.03	132.78	885.2	1770.5	2655.7	3541.0	4426.2
36	.746	.49	.24	8.98	.73	.48	.22	7.97	.71	4.8	69.5	4.3	39.1	3.8
37	.738	.48	.21	.95	.69	.43	.17	.91	.64	4.3	8.6	2.9	7.2	21.5
38	.730	.46	.19	.92	.65	.38	.11	.84	.57	3.8	7.6	1.4	5.3	19.1
39	.722	.44	.17	.89	.61	.33	.06	.78	.50	3.3	6.7	50.0	3.4	6.7
61 40	14.714	29.43	44.14	58.86	73.57	88.29	103.00	117.72	132.43	882.9	1765.7	2648.6	3531.5	4414.3
41	.706	.41	.12	.83	.53	.24	2.95	.65	.36	2.4	4.8	7.2	29.6	11.9
42	.699	.40	.10	.79	.49	.19	.89	.59	.29	1.9	3.8	5.7	7.7	09.6
43	.691	.38	.07	.76	.45	.14	.84	.53	.22	1.4	2.9	4.3	5.8	7.2
44	.683	.37	.05	.73	.41	.10	.78	.46	.15	1.0	1.9	2.9	3.8	4.8
61 45	14.675	29.35	44.02	58.70	73.38	88.05	102.73	117.40	132.07	880.5	1761.0	2641.5	3521.9	4402.4
46	.667	.33	4.00	.67	.34	8.00	.67	.33	2.00	80.0	60.0	40.0	20.0	400.0
47	.659	.32	3.98	.64	.30	7.95	.61	.27	1.93	79.5	59.1	38.6	18.1	397.7
48	.651	.30	.95	.60	.26	.91	.56	.21	.86	9.1	8.1	7.2	6.2	5.3
49	.643	.29	.93	.57	.22	.86	.51	.14	.79	8.6	7.2	5.7	4.3	2.9
61 50	14.635	29.27	43.91	58.54	73.18	87.81	102.45	117.08	131.72	878.1	1756.2	2634.3	3512.4	4390.5
51	.627	.25	.88	.51	.14	.76	.39	7.02	.65	7.6	5.2	2.9	10.5	88.1
52	.619	.24	.86	.48	.10	.72	.34	6.95	.58	7.2	4.3	1.5	08.6	5.8
53	.611	.22	.83	.44	.06	.67	.28	.89	.50	6.7	3.3	30.0	6.7	3.4
54	.603	.21	.81	.41	3.02	.62	.23	.83	.43	6.2	2.4	28.6	4.8	81.0
61 55	14.595	29.19	43.79	58.38	72.98	87.57	102.17	116.76	131.36	875.7	1751.4	2627.2	3502.9	4378.6
56	.587	.17	.76	.35	.94	.52	.11	.70	.29	5.2	50.5	5.7	501.0	6.2
57	.579	.16	.74	.32	.90	.48	.06	.64	.22	4.8	49.5	4.3	499.1	3.8
58	.572	.14	.72	.29	.86	.43	2.00	.57	.14	4.3	8.6	2.9	7.2	71.5
59	.564	.13	.69	.25	.82	.38	1.95	.51	.07	3.8	7.6	1.4	5.3	69.1
61 60	14.556	29.11	43.67	58.22	72.78	87.33	101.89	116.44	131.00	873.3	1746.7	2620.0	3493.4	4366.7

Lat.		Latitude 61° to 62°—Meridional arcs.						Latitude 61°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 61° 30′		Value of 1′	Continuous sums of minutes from latitude 61° 00′		Longitude.	X	Y
°	′	Meters.	″	Meters.	Meters.	′	Meters.	° ′	Meters.	Meters.
61	00	30.953			1857.19					
	1	3	1	30.96	.20	1	1 857.2	0 1	901.8	0.1
	2	3	2	61.91	.20	2	3 714.4	2	1 803.7	0.5
	3	3	3	92.87	.21	3	5 571.6	3	2 705.5	1.0
	4	4	4	123.82	.21	4	7 428.8	4	3 607.3	1.8
61	05	30.954	5	154.78	1857.22	5	9 286.0	0 5	4 509.1	2.9
	6	4	6	185.73	.22	6	11 143.2	6	5 411.0	4.1
	7	4	7	216.69	.22	7	13 000.5	7	6 312.8	5.6
	8	4	8	247.64	.23	8	14 857.7	8	7 214.6	7.3
	9	4	9	278.60	.23	9	16 714.9	9	8 116.4	9.3
61	10	30.954	10	309.56	1857.24	10	18 572.2	0 10	9 018.3	11.5
	11	4	1	340.51	.24	1	20 429.4	15	13 527.4	25.8
	12	4	2	371.47	.25	2	22 286.6	20	18 036.5	45.9
	13	4	3	402.42	.25	3	24 143.9	25	22 545.5	71.7
	14	4	4	433.38	.26	4	26 001.1	30	27 054.5	103.2
61	15	30.954	15	464.33	1857.26	15	27 858.4	0 35	31 563.5	140.5
	16	4	6	495.29	.27	6	29 715.7	40	36 072.5	183.5
	17	5	7	526.24	.27	7	31 572.9	45	40 581.3	232.3
	18	5	8	557.20	.28	8	33 430.2	50	45 090.1	286.8
	19	5	9	588.15	.28	9	35 287.5	55	49 598.9	347.0
61	20	30.955	20	619.11	1857.29	20	37 144.8	1 00	54 107.5	413.0
	21	5	1	650.07	.29	1	39 002.1	05	58 616.1	484.7
	22	5	2	681.02	.29	2	40 859.3	10	63 124.5	562.1
	23	5	3	711.98	.30	3	42 716.6	15	67 632.9	645.3
	24	5	4	742.93	.30	4	44 573.9	20	72 141.2	734.2
61	25	30.955	25	773.89	1857.31	25	46 431.2	1 25	76 649.3	828.8
	26	5	6	804.84	.31	6	48 288.6	30	81 157.3	929.2
	27	5	7	835.80	.32	7	50 145.9	35	85 665.2	1 035.3
	28	5	8	866.75	.32	8	52 003.2	40	90 172.9	1 147.1
	29	5	9	897.71	.33	9	53 860.5	45	94 680.5	1 264.6
61	30	30.956	30	928.67	1857.33	30	55 717.8	1 50	99 188.0	1 388.0
	31	6	1	959.62	.34	1	57 575.2	55	103 695.3	1 517.1
	32	6	2	990.58	.34	2	59 432.5	2 00	108 202	1 652
	33	6	3	1 021.53	.35	3	61 289.9	3 00	162 271	3 716
	34	6	4	1 052.49	.35	4	63 147.2	4 00	216 304	6 606
61	35	30.956	35	1 083.44	1857.35	35	65 004.6	5 00	270 285	10 320
	36	6	6	1 114.40	.36	6	66 861.9	6 00	324 204	14 857
	37	6	7	1 145.35	.36	7	68 719.3	7 00	378 047	20 217
	38	6	8	1 176.31	.37	8	70 576.7	8 00	431 802	26 399
	39	6	9	1 207.27	.37	9	72 434.0	9 00	485 456	33 400
61	40	30.956	40	1 238.22	1857.38	40	74 291.4	10 00	538 997	41 219
	41	6	1	1 269.18	.38	1	76 148.8	11 00	592 413	49 855
	42	6	2	1 300.13	.39	2	78 006.2	12 00	645 690	59 305
	43	7	3	1 331.09	.39	3	79 863.6	13 00	698 817	69 567
	44	7	4	1 362.04	.40	4	81 721.0	14 00	751 781	80 639
61	45	30.957	45	1 393.00	1857.40	45	83 578.4	15 00	804 570	92 518
	46	7	6	1 423.95	.41	6	85 435.8	16 00	857 172	105 201
	47	7	7	1 454.91	.41	7	87 293.2	17 00	909 574	118 686
	48	7	8	1 485.87	.41	8	89 150.6	18 00	961 764	132 969
	49	7	9	1 516.82	.42	9	91 008.0	19 00	1 013 729	148 048
61	50	30.957	50	1 547.78	1857.42	50	92 865.4	20 00	1 065 459	163 917
	51	7	1	1 578.73	.43	1	94 722.8	21 00	1 116 940	180 575
	52	7	2	1 609.69	.43	2	96 580.3	22 00	1 168 161	198 016
	53	7	3	1 640.64	.44	3	98 437.7	23 00	1 219 110	216 237
	54	7	4	1 671.60	.44	4	100 295.2	24 00	1 269 775	235 234
61	55	30.957	55	1 702.55	1857.45	55	102 152.6	25 00	1 320 144	255 002
	56	8	6	1 733.51	.45	6	104 010.0	26 00	1 370 205	275 537
	57	8	7	1 764.46	.46	7	105 867.5	27 00	1 419 947	296 833
	58	8	8	1 795.42	.46	8	107 725.0	28 00	1 469 358	318 886
	59	8	9	1 826.38	.46	9	109 582.4	29 00	1 518 426	341 691
61	60	30.958	60	1 857.33	1857.47	60	111 439.9	30 00	1 567 141	365 242

Latitude 62° to 63°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
62 00	14.556	29.11	43.67	58.22	72.78	87.33	101.89	116.45	131.00	873.3	1746.7	2620.0	3493.4	4366.7
1	.548	.10	.64	.19	.74	.29	.83	.38	0.93	2.9	5.7	18.6	91.4	4.3
2	.540	.08	.62	.16	.70	.24	.78	.32	.86	2.4	4.8	7.2	89.5	61.9
3	.532	.06	.60	.13	.66	.19	.72	.25	.79	1.9	3.8	5.7	7.6	59.5
4	.524	.05	.57	.10	.62	.14	.67	.19	.72	1.4	2.9	4.3	5.7	7.1
62 05	14.516	29.03	43.55	58.06	72.58	87.10	101.61	116.13	130.65	871.0	1741.9	2612.9	3483.8	4354.8
6	.508	.02	.52	.03	.54	.05	.55	.06	.57	0.5	0.9	1.4	1.9	2.4
7	.500	9.00	.50	8.00	.50	7.00	.50	6.00	.50	70.0	40.0	10.0	80.0	50.0
8	.492	8.98	.48	7.97	.46	6.95	.44	5.94	.43	69.5	39.0	08.6	78.1	47.6
9	.484	.97	.45	.94	.42	.90	.89	.87	.35	9.0	8.1	7.1	6.2	5.2
62 10	14.476	28.95	43.43	57.90	72.38	86.86	101.33	115.81	130.28	868.6	1737.1	2605.7	3474.3	4342.8
11	.468	.94	.40	.87	.34	.81	.28	.74	.21	8.1	6.1	4.3	2.3	40.4
12	.460	.92	.38	.84	.30	.76	.22	.68	.14	7.6	5.2	2.8	70.4	38.0
13	.452	.90	.36	.81	.26	.71	.17	.62	.07	7.1	4.2	1.4	68.5	5.6
14	.444	.89	.33	.78	22	.67	.11	.55	30.00	6.7	3.3	600.0	6.6	3.3
62 15	14.436	28.87	43.31	57.74	72.18	86.62	101.05	115.49	129.93	866.2	1732.3	2598.5	3464.7	4330.9
16	.428	.86	.29	.71	.14	.57	1.00	.43	.85	5.7	1.4	7.1	2.8	28.5
17	.420	.84	.26	.68	.10	.52	0.94	.36	.78	5.2	30.4	5.6	60.9	6.1
18	.412	.82	.24	.65	.06	.47	.89	.30	.71	4.7	29.5	4.2	59.0	3.7
19	.404	.81	.21	.62	2.02	.43	.83	.23	.64	4.3	8.5	2.8	7.0	21.3
62 20	14.396	28.79	43.19	57.59	71.98	86.38	100.78	115.17	129.57	863.8	1727.6	2591.3	3455.1	4318.9
21	.388	.78	.17	.55	.94	.33	.72	.11	.50	3.3	6.6	89.9	3.2	6.5
22	.380	.76	.14	.52	.90	.28	.67	5.04	.43	2.8	5.7	8.5	51.3	4.1
23	.372	.74	.12	.49	.86	.23	.61	4.98	.35	2.3	4.7	7.0	49.4	11.7
24	.364	.73	.09	.46	.82	.19	.56	.92	.28	1.9	3.8	5.6	7.5	09.3
62 25	14.356	28.71	43.07	57.43	71.78	86.14	100.50	114.85	129.21	861.4	1722.8	2584.2	3445.6	4306.9
26	.348	.70	.05	.39	.74	.09	.44	.79	.14	0.9	1.8	2.7	3.6	4.5
27	.340	.68	.02	.36	.70	.04	.39	.72	9.07	0.4	20.9	81.3	41.7	302.1
28	.333	.67	3.00	.33	.66	6.00	.33	.66	8.99	60.0	19.9	79.9	39.8	299.8
29	.325	.65	2.97	.30	.62	5.95	.28	.60	.92	59.5	9.0	8.4	7.9	7.4
62 30	14.317	28.63	42.95	57.27	71.58	85.90	100.22	114.53	128.85	859.0	1718.0	2577.0	3436.0	4295.0
31	.309	.62	.93	.23	.54	.85	.16	.47	.78	8.5	7.0	5.5	4.1	2.6
32	.301	.60	.90	.20	.50	.80	.11	.40	.71	8.0	6.1	4.1	2.1	90.2
33	.293	.59	.88	.17	.46	.76	.05	.34	.63	7.6	5.1	2.7	30.2	87.8
34	.285	.57	.85	.14	.42	.71	100.00	.28	.56	7.1	4.2	71.2	28.3	5.4
62 35	14.277	28.55	42.83	57.11	71.38	85.66	99.94	114.21	128.49	856.6	1713.2	2569.8	3426.4	4283.0
36	.269	.54	.81	.07	.34	.61	.88	.15	.42	6.1	2.2	8.3	4.5	80.6
37	.261	.52	.78	.04	.30	.56	.83	.08	.35	5.6	1.3	6.9	2.5	78.2
38	.253	.51	.76	7.01	.26	.52	.77	4.02	.27	5.2	10.3	5.5	20.6	5.8
39	.245	.49	.73	6.98	.22	.47	.72	3.96	.20	4.7	09.4	4.0	18.7	3.4
62 40	14.237	28.47	42.71	56.95	71.18	85.42	99.66	113.89	128.13	854.2	1708.4	2562.6	3416.8	4271.0
41	.229	.45	.69	.91	.14	.36	.60	.83	8.06	3.6	7.4	61.1	4.9	68.6
42	.221	.44	.66	.88	.10	.32	.55	.76	7.99	3.2	6.5	59.7	2.9	6.2
43	.213	.43	.64	.85	.06	.28	.49	.70	.91	2.8	5.5	8.3	11.0	3.8
44	.205	.41	.61	.82	1.02	.23	.44	.64	.84	2.3	4.6	6.8	09.1	61.4
62 45	14.197	28.39	42.59	56.79	70.98	85.18	99.38	113.57	127.77	851.8	1703.6	2555.4	3407.2	4259.0
46	.189	.38	.57	.75	.94	.13	.32	.51	.70	1.3	2.6	3.9	5.3	6.6
47	.181	.36	.54	.72	.90	.08	.27	.44	.63	0.8	1.7	2.5	3.3	4.2
48	.173	.35	.52	.69	.86	5.04	.21	.38	.55	50.4	700.7	51.1	401.4	51.8
49	.165	.33	.49	.66	.82	4.99	.16	.32	.48	49.9	699.8	49.6	399.5	49.4
62 50	14.157	28.31	42.47	56.63	70.78	84.94	99.10	113.25	127.41	849.4	1698.8	2548.2	3397.6	4247.0
51	.149	.30	.45	.59	.74	.89	9.04	.19	.34	8.9	7.8	6.7	5.6	4.6
52	.140	.28	.42	.56	.70	.84	8.99	.12	.27	8.4	6.9	5.3	3.7	42.1
53	.132	.26	.40	.53	.66	.79	.93	.06	.19	7.9	5.9	3.8	91.8	39.7
54	.124	.25	.37	.50	.62	.75	.87	3.00	.12	7.5	5.0	2.4	89.9	7.3
62 55	14.116	28.23	42.35	56.47	70.58	84.70	98.82	112.93	127.05	847.0	1694.0	2541.0	3387.9	4234.9
56	.108	.22	.33	.43	.54	.65	.76	.87	6.98	6.5	3.0	39.5	6.0	2.5
57	.100	.20	.30	.40	.50	.60	.70	.80	.91	6.0	2.1	8.1	4.1	30.1
58	.092	.18	.28	.37	.46	.55	.64	.74	.83	5.5	1.1	6.6	2.2	27.7
59	.084	.17	.25	.34	.42	.51	.59	.67	.76	5.1	90.2	5.2	80.2	5.3
62 60	14.076	28.15	42.23	56.31	70.38	84.46	98.53	112.61	126.69	844.6	1689.2	2533.7	3378.3	4222.9

Lat.		Latitude 62° to 63°—Meridional arcs.						Latitude 62°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 62° 30′		Value of 1′	Continuous sums of minutes from latitude 62° 00′		Longitude.	X	Y
°	′	Meters.	″	Meters.	Meters.	′	Meters.	° ′	Meters.	Meters.
62	00	30.958			1857.47					
	1	8	1	30.96	.47	1	1 857.5	0 1	873.3	0.1
	2	8	2	61.92	.48	2	3 714.9	2	1 746.7	0.4
	3	8	3	92.88	.48	3	5 572.4	3	2 620.0	1.0
	4	8	4	123.84	.49	4	7 429.9	4	3 493.4	1.8
62	05	30.958	5	154.80	1857.49	5	9 287.4	0 5	4 366.7	2.8
	6	8	6	185.76	.50	6	11 144.9	6	5 240.0	4.0
	7	8	7	216.72	.50	7	13 002.4	7	6 113.4	5.5
	8	8	8	247.68	.51	8	14 859.9	8	6 986.7	7.2
	9	9	9	278.64	.51	9	16 717.4	9	7 860.0	9.1
62	10	30.959	10	309.60	1857.52	10	18 574.9	0 10	8 733.4	11.2
	11	9	1	340.56	.52	1	20 432.5	15	13 100.1	25.2
	12	9	2	371.52	.52	2	22 290.0	20	17 466.7	44.9
	13	9	3	402.48	.53	3	24 147.5	25	21 833.3	70.1
	14	9	4	433.44	.53	4	26 005.0	30	26 199.9	100.9
62	15	30.959	15	464.40	1857.54	15	27 862.6	0 35	30 566.4	137.4
	16	9	6	495.36	.54	6	29 720.1	40	34 932.9	179.5
	17	9	7	526.32	.55	7	31 577.7	45	39 299.4	227.1
	18	9	8	557.28	.55	8	33 435.2	50	43 665.7	280.4
	19	9	9	588.24	.56	9	35 292.8	55	48 032.0	339.3
62	20	30.959	20	619.20	1857.56	20	37 150.3	1 00	52 398.3	403.8
	21	9	1	650.16	.57	1	39 007.9	05	56 764.3	473.8
	22	59	2	681.12	.57	2	40 865.5	10	61 130.4	549.5
	23	60	3	712.08	.57	3	42 723.0	15	65 496.4	630.8
	24	0	4	743.04	.58	4	44 580.6	20	69 862.2	717.7
62	25	30.960	25	774.00	1857.58	25	46 438.2	1 25	74 227.9	810.3
	26	0	6	804.96	.59	6	48 295.8	30	78 593.5	908.4
	27	0	7	835.92	.59	7	50 153.4	35	82 959.0	1 012.1
	28	0	8	866.88	.60	8	52 011.0	40	87 324.3	1 121.5
	29	0	9	897.84	.60	9	53 868.6	45	91 689.5	1 236.4
62	30	30.960	30	928.80	1857.61	30	55 726.2	1 50	96 054.5	1 357.0
	31	0	1	959.76	.61	1	57 583.8	55	100 419.4	1 483.1
	32	0	2	990.72	.61	2	59 441.4	2 00	104 784	1 615
	33	0	3	1 021.68	.62	3	61 299.0	3 00	157 145	3 633
	34	0	4	1 052.64	.62	4	63 156.6	4 00	209 469	6 458
62	35	30.960	35	1 083.60	1857.63	35	65 014.2	5 00	261 742	10 089
	36	1	6	1 114.56	.63	6	66 871.9	6 00	313 954	14 525
	37	1	7	1 145.52	.64	7	68 729.5	7 00	366 091	19 765
	38	1	8	1 176.48	.64	8	70 587.1	8 00	418 142	25 807
	39	1	9	1 207.44	.65	9	72 444.8	9 00	470 093	32 652
62	40	30.961	40	1 238.40	1857.65	40	74 302.4	10 00	521 932	40 296
	41	1	1	1 269.36	.66	1	76 160.1	11 00	573 647	48 737
	42	1	2	1 300.32	.66	2	78 017.7	12 00	625 226	57 975
	43	1	3	1 331.28	.66	3	79 875.4	13 00	676 657	68 006
	44	1	4	1 362.24	.67	4	81 733.1	14 00	727 927	78 829
62	45	30.961	45	1 393.20	1857.67	45	83 590.7	15 00	779 024	90 441
	46	1	6	1 424.16	.68	6	85 448.4	16 00	829 936	102 838
	47	1	7	1 455.12	.68	7	87 306.1	17 00	880 651	116 019
	48	1	8	1 486.08	.69	8	89 163.8	18 00	931 157	129 980
	49	2	9	1 517.04	.69	9	91 021.5	19 00	981 442	144 717
62	50	30.962	50	1 548.00	1857.70	50	92 879.2	20 00	1 031 494	160 227
	51	2	1	1 578.96	.70	1	94 736.9	21 00	1 081 300	176 507
	52	2	2	1 609.93	.70	2	96 594.6	22 00	1 130 850	193 552
	53	2	3	1 640.89	.71	3	98 452.3	23 00	1 180 132	211 359
	54	2	4	1 671.85	.71	4	100 310.1	24 00	1 229 133	229 923
62	55	30.962	55	1 702.81	1857.72	55	102 167.8	25 00	1 277 842	249 240
	56	2	6	1 733.77	.72	6	104 025.5	26 00	1 326 248	269 306
	57	2	7	1 764.73	.73	7	105 883.2	27 00	1 374 339	290 114
	58	2	8	1 795.69	.73	8	107 741.0	28 00	1 422 103	311 662
	59	2	9	1 826.65	.74	9	109 598.7	29 00	1 469 530	333 943
62	60	30.962	60	1 857.61	1857.74	60	111 456.4	30 00	1 516 608	356 952

Latitude 63° to 64°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
63 00	14.076	28.15	42.23	56.31	70.38	84.46	98.53	112.61	126.69	844.6	1689.2	2533.7	3378.3	4222.9
1	.068	.14	.21	.28	.34	.41	.47	.55	.62	4.1	8.2	2.3	6.4	20.5
2	.060	.12	.18	.24	.30	.36	.42	.48	.54	3.6	7.2	30.9	4.5	18.1
3	.052	.10	.16	.21	.26	.31	.36	.42	.47	3.1	6.3	29.4	2.6	5.7
4	.044	.09	.13	.18	.22	.27	.31	.35	.40	2.7	5.3	8.0	70.6	3.3
63 05	14.036	28.07	42.11	56.14	70.18	84.22	98.25	112.29	126.32	842.2	1684.4	2526.5	3368.7	4210.9
6	.028	.05	.08	.11	.14	.17	.19	.23	.25	1.7	3.4	5.0	6.8	08.4
7	.020	.04	.06	.08	.10	.12	.14	.16	.18	1.2	2.4	3.6	4.8	6.0
8	.012	.02	.04	.05	.06	.07	.08	.10	.11	0.7	1.4	2.2	2.9	3.6
9	.004	8.01	2.01	6.02	70.02	4.02	8.03	2.03	6.04	40.2	80.5	20.7	61.0	201.2
63 10	13.996	27.99	41.99	55.98	69.98	83.98	97.97	111.97	125.96	839.8	1679.5	2519.3	3359.0	4198.8
11	.988	.97	.96	.95	.94	.93	.91	.91	.89	9.3	8.6	7.8	7.1	6.4
12	.980	.96	.94	.92	.90	.88	.86	.84	.82	8.8	7.6	6.4	5.2	4.0
13	.972	.94	.92	.89	.86	.83	.80	.78	.75	8.3	6.6	5.0	3.3	91.6
14	.964	.93	.89	.86	.82	.78	.75	.71	.68	7.8	5.7	3.5	51.3	89.2
63 15	13.956	27.91	41.87	55.82	69.78	83.73	97.69	111.65	125.60	837.3	1674.7	2512.0	3349.4	4186.7
16	.948	.89	.84	.79	.74	.69	.63	.58	.53	6.9	3.7	10.6	7.5	4.3
17	.940	.88	.82	.76	.70	.64	.58	.52	.46	6.4	2.8	09.1	5.5	81.9
18	.932	.86	.80	.73	.66	.59	.52	.45	.38	5.9	1.8	7.7	3.6	79.5
19	.924	.85	.77	.69	.62	.54	.47	.39	.31	5.4	70.8	6.3	41.7	7.1
63 20	13.916	27.83	41.75	55.66	69.58	83.49	97.41	111.32	125.24	834.9	1669.9	2504.8	3339.8	4174.7
21	.908	.81	.72	.63	.54	.45	.35	.26	.17	4.5	8.9	3.4	7.8	72.3
22	.900	.80	.70	.60	.50	.40	.30	.19	.10	4.0	8.0	1.9	5.9	69.9
23	.891	.78	.67	.57	.46	.35	.24	.13	5.02	3.5	7.0	500.4	3.9	7.4
24	.883	.77	.65	.53	.42	.30	.18	.07	4.95	3.0	6.0	499.0	2.0	5.0
63 25	13.875	27.75	41.63	55.50	69.38	83.25	97.13	111.00	124.88	832.5	1665.0	2497.6	3330.1	4162.6
26	.867	.73	.60	.47	.34	.20	.07	0.94	.81	2.0	4.0	6.1	28.2	60.2
27	.859	.72	.58	.44	.30	.16	7.02	.87	.74	1.6	3.1	4.7	6.2	57.8
28	.851	.70	.55	.40	.26	.11	6.96	.81	.66	1.1	2.2	3.2	4.3	5.4
29	.843	.69	.53	.37	.22	.06	.91	.74	.59	0.6	1.2	1.7	2.3	2.9
63 30	13.835	27.67	41.51	55.34	69.18	83.01	96.85	110.68	124.52	830.1	1660.2	2490.3	3320.4	4150.5
31	.827	.65	.48	.31	.14	2.96	.79	.62	.45	29.6	59.2	88.9	18.5	48.1
32	.819	.64	46	.28	.10	.91	.74	.55	.37	9.1	8.3	7.4	6.6	5.7
33	.811	.62	.43	.24	.96	.87	.68	.49	.30	8.7	7.3	6.0	4.6	3.3
34	.803	.61	.41	.21	9.02	.82	.62	.42	.23	8.2	6.3	4.5	2.7	40.8
63 35	13.795	27.59	41.38	55.18	68.97	82.77	96.56	110.35	124.15	827.7	1655.4	2483.0	3310.7	4138.4
36	.787	.57	.36	.15	.93	.72	.51	.30	.08	7.2	4.4	1.6	08.8	6.0
37	.779	.56	.34	.12	.89	.67	.45	.23	4.01	6.7	3.4	80.2	6.9	3.6
38	.771	.54	.31	.08	.85	.62	.39	.17	3.94	6.2	2.5	78.7	5.0	31.2
39	.762	.53	.29	.05	.81	.57	.34	.10	.86	5.7	1.5	7.2	3.0	28.7
63 40	13.754	27.51	41.26	55.02	68.77	82.53	96.28	110.04	123.79	825.3	1650.5	2475.8	3301.0	4126.3
41	.746	.49	.24	4.99	.73	.48	.22	09.97	.71	4.8	49.6	4.3	299.1	3.9
42	.738	.48	.21	.95	.69	.43	.17	.91	.64	4.3	8.6	2.9	7.2	21.5
43	.730	.46	.19	.92	.65	.38	.11	.84	.57	3.8	7.6	1.4	5.2	19.0
44	.722	.45	.17	.89	.61	.33	.06	.78	.50	3.3	6.6	70.0	3.3	6.6
63 45	13.714	27.43	41.14	54.86	68.57	82.28	96.00	109.71	123.43	822.8	1645.7	2468.5	3291.4	4114.2
46	.706	.41	.12	.82	.53	.24	5.94	.65	.35	2.4	4.7	7.1	89.4	11.8
47	.698	.40	.09	.79	.49	.19	.89	.58	.28	1.9	3.8	5.6	7.5	09.4
48	.690	.38	.07	.76	.45	.14	.83	.52	.21	1.4	2.8	4.1	5.5	6.9
49	.682	.36	.04	.73	.41	.09	.77	.45	.13	0.9	1.8	2.7	3.6	4.5
63 50	13.674	27.35	41.02	54.69	68.37	82.04	95.72	109.39	123.06	820.4	1640.8	2461.3	3281.7	4102.1
51	.666	.33	1.00	.66	.33	1.99	.66	.33	2.99	19.9	39.9	59.8	79.8	099.7
52	.657	.31	0.97	.63	.29	.94	.60	.26	.92	9.4	8.9	8.3	7.8	7.2
53	.649	.30	.95	.60	.25	.90	.55	.20	.84	9.0	7.9	6.9	5.8	4.8
54	.641	.28	.92	.56	.21	.85	.49	.13	.77	8.5	7.0	5.4	3.9	92.4
63 55	13.633	27.27	40.90	54.53	68.16	81.80	95.43	109.06	122.70	818.0	1636.0	2453.9	3271.9	4089.9
56	.625	.25	.88	.50	.12	.75	.38	9.00	.62	7.5	5.0	2.5	70.0	7.5
57	.617	.23	.85	.47	.08	.70	.32	8.94	.55	7.0	4.0	51.1	68.1	5.1
58	.609	.22	.83	.44	.04	.66	.25	.87	.48	6.5	3.1	49.6	6.2	2.7
59	.601	.20	.80	.40	8.00	.61	.20	.81	.41	6.1	2.1	8.1	4.2	80.2
63 60	13.593	27.19	40.78	54.37	67.96	81.56	95.15	108.74	122.33	815.6	1631.1	2446.7	3262.2	4077.8

Lat.		Latitude 63° to 64°—Meridional arcs.						Latitude 63°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 63° 30′		Value of 1′	Continuous sums of minutes from latitude 63° 00′		Longitude.	X	Y
°	′	*Meters.*	″	*Meters.*	*Meters.*	′	*Meters.*	° ′	*Meters.*	*Meters.*
63	00	30.962			1857.74					
	1	2	1	30.96	.74	1	1 857.7	0 1	844.6	0.1
	2	2	2	61.93	.75	2	3 715.5	2	1 689.2	0.4
	3	3	3	92.89	.75	3	5 573.2	3	2 533.7	1.0
	4	3	4	123.86	.76	4	7 431.0	4	3 378.3	1.7
63	05	30.963	5	154.82	1857.76	5	9 288.8	0 5	4 222.9	2.7
	6	3	6	185.79	.77	6	11 146.5	6	5 067.5	3.9
	7	3	7	216.75	.77	7	13 004.3	7	5 912.1	5.4
	8	3	8	247.72	.78	8	14 862.1	8	6 756.6	7.0
	9	3	9	278.68	.78	9	16 719.8	9	7 601.2	8.9
63	10	30.963	10	309.65	1857.78	10	18 577.6	0 10	8 445.8	11.0
	11	3	1	340.61	.79	1	20 435.4	15	12 668.7	24.6
	12	3	2	371.57	.79	2	22 293.2	20	16 891.6	43.8
	13	3	3	402.54	.80	3	24 151.0	25	21 114.4	68.4
	14	3	4	433.50	.80	4	26 008.8	30	25 337.2	98.5
63	15	30.963	15	464.47	1857.81	15	27 866.6	0 35	29 559.9	134.1
	16	4	6	495.43	.81	6	29 724.4	40	33 782.6	175.1
	17	4	7	526.40	.82	7	31 582.2	45	38 005.3	221.6
	18	4	8	557.36	.82	8	33 440.0	50	42 227.9	273.6
	19	4	9	588.33	.82	9	35 297.9	55	46 450.4	331.1
63	20	30.964	20	619.29	1857.83	20	37 155.7	1 00	50 672.8	394.0
	21	4	1	650.26	.83	1	39 013.5	05	54 895.2	462.4
	22	4	2	681.22	.84	2	40 871.4	10	59 117.4	536.3
	23	4	3	712.18	.84	3	42 729.2	15	63 339.6	615.6
	24	4	4	743.15	.85	4	44 587.0	20	67 561.6	700.4
63	25	30.964	25	774.11	1857.85	25	46 444.9	1 25	71 783.6	790.7
	26	4	6	805.08	.86	6	48 302.7	30	76 005.4	886.5
	27	4	7	836.04	.86	7	50 160.6	35	80 227.1	987.7
	28	4	8	867.01	.86	8	52 018.5	40	84 448.6	1 094.4
	29	4	9	897.98	.87	9	53 876.3	45	88 670.1	1 206.6
63	30	30.965	30	928.94	1857.87	30	55 734.2	1 50	92 891.3	1 324.2
	31	5	1	959.90	.88	1	57 592.1	55	97 112.5	1 447.4
	32	5	2	990.87	.88	2	59 450.0	2 00	101 333	1 576
	33	5	3	1 021.83	.89	3	61 307.9	3 00	151 970	3 546
	34	5	4	1 052.80	.89	4	63 165.7	4 00	202 569	6 302
63	35	30.965	35	1 083.76	1857.90	35	65 023.6	5 00	253 119	9 846
	36	5	6	1 114.72	.90	6	66 881.5	6 00	303 608	14 175
	37	5	7	1 145.69	.90	7	68 739.4	7 00	354 024	19 288
	38	5	8	1 176.65	.91	8	70 597.3	8 00	404 354	25 185
	39	5	9	1 207.62	.91	9	72 455.2	9 00	454 586	31 864
63	40	30.965	40	1 238.58	1857.92	40	74 313.2	10 00	504 709	39 323
	41	5	1	1 269.55	.92	1	76 171.1	11 00	554 709	47 561
	42	5	2	1 300.51	.93	2	78 029.0	12 00	604 575	56 575
	43	6	3	1 331.48	.93	3	79 886.9	13 00	654 295	66 363
	44	6	4	1 362.44	.94	4	81 744.9	14 00	703 857	76 924
63	45	30.966	45	1 393.41	1857.94	45	83 602.8	15 00	753 249	88 254
	46	6	6	1 424.37	.94	6	85 460.7	16 00	802 458	100 350
	47	6	7	1 455.33	.95	7	87 318.7	17 00	851 473	113 211
	48	6	8	1 486.30	.95	8	89 176.6	18 00	900 283	126 832
	49	6	9	1 517.26	.96	9	91 034.6	19 00	948 874	141 210
63	50	30.966	50	1 548.23	1857.96	50	92 892.6	20 00	997 237	156 343
	51	6	1	1 579.19	.97	1	94 750.5	21 00	1 045 358	172 225
	52	6	2	1 610.16	.97	2	96 608.5	22 00	1 093 226	188 854
	53	6	3	1 641.12	.97	3	98 466.5	23 00	1 140 830	206 225
	54	6	4	1 672.09	.98	4	100 324.4	24 00	1 188 158	224 335
63	55	30.966	55	1 703.05	1857.98	55	102 182.4	25 00	1 235 199	243 178
	56	6	6	1 734.02	.99	6	104 040.4	26 00	1 281 941	262 750
	57	7	7	1 764.98	7.99	7	105 898.4	27 00	1 328 373	283 047
	58	7	8	1 795.94	8.00	8	107 756.4	28 00	1 374 483	304 064
	59	7	9	1 826.91	.00	9	109 614.4	29 00	1 420 262	325 795
63	60	30.967	60	1 857.87	1858.00	60	111 472.4	30 00	1 465 696	348 235

Latitude 64° to 65°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
64 00	13.593	27.19	40.78	54.37	67.96	81.56	95.15	108.74	122.33	815.6	1631.1	2446.7	3262.2	4077.8
1	.585	.17	.75	.34	.92	.51	.09	.68	.26	5.1	30.1	5.2	60.3	5.4
2	.576	.15	.73	.31	.88	.46	5.03	.61	.19	4.6	29.2	3.8	58.4	2.9
3	.568	.14	.71	.27	.84	.41	4.98	.55	.11	4.1	8.2	2.3	6.4	70.5
4	.560	.12	.68	.24	.80	.36	.92	.48	2.04	3.6	7.3	40.9	4.5	68.1
64 05	13.552	27.10	40.66	54.21	67.76	81.31	94.87	108.42	121.97	813.1	1626.3	2439.4	3252.5	4065.7
6	.544	.09	.63	.18	.72	.26	.81	.35	.90	2.6	5.3	7.9	50.6	3.2
7	.536	.07	.61	.14	.68	.21	.75	.29	.82	2.1	4.3	6.5	48.6	60.8
8	.528	.06	.58	.11	.64	.17	.70	.22	.75	1.7	3.4	5.0	6.7	58.4
9	.520	.04	.56	.08	.60	.12	.64	.16	.68	1.2	2.4	3.6	4.7	5.9
64 10	13.512	27.02	40.54	54.05	67.56	81.07	94.58	108.09	121.60	810.7	1621.4	2432.1	3242.8	4053.5
11	.504	7.01	.51	4.01	.52	1.02	.53	8.03	.54	10.2	20.4	30.6	40.9	51.1
12	.495	6.99	.49	3.98	.48	0.97	.47	7.96	.46	09.7	19.4	29.2	38.9	48.6
13	.487	.97	.46	.95	.44	.92	.41	.90	.39	9.2	8.5	7.7	7.0	6.2
14	.479	.96	.44	.92	.40	.88	.35	.83	.31	8.8	7.5	6.3	5.d	3.8
64 15	13.471	26.94	40.41	53.88	67.35	80.83	94.30	107.77	121.24	808.3	1616.5	2424.8	3233.1	4041.3
16	.463	.93	.39	.85	.31	.78	.24	.70	.17	7.8	5.5	3.3	31.1	38.9
17	.455	.91	.37	.82	.27	.73	.18	.64	.09	7.3	4.6	1.9	29.2	6.5
18	.447	.89	.34	.79	.23	.68	.12	.57	1.02	6.8	3.6	20.4	7.2	4.0
19	.439	.88	.32	.75	.19	.63	.07	.51	0.95	6.3	2.7	19.0	5.3	31.6
64 20	13.431	26.86	40.29	53.72	67.15	80.58	94.01	107.45	120.88	805.8	1611.7	2417.5	3223.3	4029.2
21	.422	.84	.27	.69	.11	.53	3.96	.38	.80	5.3	10.7	6.0	21.4	6.7
22	.414	.83	.24	.66	.07	.49	.90	.31	.73	4.9	09.7	4.6	19.4	4.3
23	.406	.81	.22	.62	7.03	.44	.84	.25	.65	4.4	8.8	3.1	7.5	21.8
24	.398	.80	.19	.59	6.99	.39	.79	.18	.58	3.9	7.8	1.6	5.5	19.4
64 25	13.390	26.78	40.17	53.56	66.95	80.34	93.73	107.12	120.51	803.4	1606.8	2410.2	3213.6	4017.0
26	.382	.76	.15	.53	.91	.29	.67	7.05	.43	2.9	5.8	08.7	11.6	4.5
27	.374	.75	.12	.49	.87	.24	.62	6.99	.36	2.4	4.8	7.3	09.7	12.1
28	.366	.73	.10	.46	.83	.19	.56	.93	.29	1.9	3.9	5.8	7.7	09.7
29	.357	.71	.07	.43	.79	.14	.50	.86	.22	1.4	2.9	4.3	5.8	7.2
64 30	13.349	26.70	40.05	53.40	66.75	80.10	93.45	106.79	120.14	801.0	1601.9	2402.9	3203.8	4004.8
31	.341	.68	.02	.36	.71	.05	.39	.73	20.07	0.5	600.9	401.4	201.9	4002.3
32	.333	.67	40.00	.33	.67	80.00	.33	.66	19.99	800.0	599.9	399.9	199.9	3999.9
33	.325	.65	39.98	.30	.63	79.95	.28	.60	.92	799.5	9.0	8.5	8.0	7.5
34	.317	.63	.95	.27	.58	.90	.21	.53	.85	9.0	8.0	7.0	6.0	5.0
64 35	13.309	26.62	39.93	53.23	66.54	79.85	93.16	106.47	119.78	798.5	1597.0	2395.5	3194.1	3992.6
36	.300	.60	.90	.20	.50	.80	.10	.40	.70	8.0	6.0	4.1	2.1	90.1
37	.292	.58	.88	.17	.46	.75	3.05	.34	.63	7.5	5.1	2.6	90.2	87.7
38	.284	.57	.85	.14	.42	.71	2.99	.27	.56	7.1	4.1	91.2	88.2	5.3
39	.276	.55	.83	.10	.38	.66	.93	.21	.48	6.6	3.1	89.7	6.2	2.8
64 40	13.268	26.54	39.80	53.07	66.34	79.61	92.88	106.14	119.41	796.1	1592.2	2388.2	3184.3	3980.4
41	.260	.52	.78	.04	.30	.56	.82	.08	.34	5.6	1.2	6.8	2.3	77.9
42	.252	.50	.75	3.01	.26	.51	.76	6.01	.26	5.1	90.2	5.3	80.4	5.5
43	.243	.49	.73	2.97	.22	.46	.70	5.95	.19	4.6	89.3	3.8	78.4	3.0
44	.235	.47	.71	.94	.18	.41	.65	.88	.12	4.1	8.3	2.4	6.5	70.6
64 45	13.227	26.45	39.68	52.91	66.14	79.36	92.59	105.82	119.04	793.6	1587.3	2380.9	3174.5	3968.2
46	.219	.44	.66	.88	.09	.31	.53	.75	8.97	3.1	6.3	79.4	2.6	5.7
47	.211	.42	.63	.84	.05	.27	.48	.69	.90	2.7	5.3	8.0	70.6	3.3
48	.203	.41	.61	.81	6.01	.22	.42	.62	.82	2.2	4.4	6.5	68.7	60.8
49	.195	.39	.58	.78	5.97	.17	.36	.56	.75	1.7	3.4	5.0	6.7	58.4
64 50	13.186	26.37	39.56	52.75	65.93	79.12	92.30	105.49	118.68	791.2	1582.4	2373.6	3164.7	3955.9
51	.178	.36	.54	.71	.89	.07	.25	.43	.61	0.7	1.4	2.1	2.8	3.5
52	.170	.34	.51	.68	.85	9.02	.19	.36	.53	90.2	80.4	70.6	60.8	51.0
53	.162	.32	.49	.65	.81	8.97	.13	.30	.46	89.7	79.5	69.2	58.9	48.6
54	.154	.31	.46	.62	.77	.92	.08	.23	.38	9.2	8.5	7.7	6.9	6.1
64 55	13.146	26.29	39.44	52.58	65.73	78.87	92.02	105.17	118.31	788.7	1577.5	2366.2	3155.0	3943.7
56	.137	.27	.41	.55	.69	.82	1.96	.10	.24	8.2	6.5	4.7	3.0	41.2
57	.129	.26	.39	.52	.65	.78	.91	5.03	.16	7.8	5.5	3.3	51.0	38.8
58	.121	.24	.36	.48	.60	.73	.85	4.97	.09	7.3	4.6	1.8	49.1	6.3
59	.113	.23	.34	.45	.56	.68	.79	.90	8.02	6.8	3.6	60.8	7.1	3.9
64 60	13.105	26.21	39.31	52.42	65.52	78.63	91.73	104.84	117.94	786.3	1572.6	2358.9	3145.2	3931.5

Lat.		Latitude 64° to 65°—Meridional arcs.						Latitude 64°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 64° 30′		Value of 1′	Continuous sums of minutes from latitude 64° 00′		Longitude.	X	Y
°	′	Meters.	″	Meters.	Meters.	′	Meters.	° ′	Meters.	Meters.
64	00	30.967			1858.00					
	1	7	1	30.97	.01	1	1 858.0	0 1	815.6	0.1
	2	7	2	61.94	.01	2	3 716.0	2	1 631.1	0.4
	3	7	3	92.91	.02	3	5 574.0	3	2 446.7	1.0
	4	7	4	123.88	.02	4	7 432.1	4	3 262.2	1.7
64	05	30.967	5	154.84	1858.03	5	9 290.1	0 5	4 077.8	2.7
	6	7	6	185.81	.03	6	11 148.1	6	4 893.4	3.8
	7	7	7	216.78	.04	7	13 006.1	7	5 708.9	5.2
	8	7	8	247.75	.04	8	14 864.2	8	6 524.5	6.8
	9	7	9	278.72	.04	9	16 722.2	9	7 340.1	8.6
64	10	30.967	10	309.69	1858.05	10	18 580.3	0 10	8 155.6	10.7
	11	8	1	340.66	.05	1	20 438.3	15	12 233.4	24.0
	12	8	2	371.63	.06	2	22 296.4	20	16 311.2	42.6
	13	8	3	402.60	.06	3	24 154.4	25	20 388.9	66.6
	14	8	4	433.56	.07	4	26 012.5	30	24 466.6	95.9
64	15	30.968	15	464.53	1858.07	15	27 870.6	0 35	28 544.3	130.6
	16	8	6	495.50	.07	6	29 728.6	40	32 621.9	170.6
	17	8	7	526.47	.08	7	31 586.7	45	36 699.5	215.9
	18	8	8	557.44	.08	8	33 444.8	50	40 777.0	266.5
	19	8	9	588.41	.09	9	35 302.9	55	44 854.4	322.5
64	20	30.968	20	619.38	1858.09	20	37 161.0	1 00	48 931.7	383.8
	21	8	1	650.35	.10	1	39 019.1	05	53 009.0	450.4
	22	8	2	681.32	.10	2	40 877.2	10	57 086.2	522.4
	23	8	3	712.28	.10	3	42 735.3	15	61 163.3	599.7
	24	8	4	743.25	.11	4	44 593.4	20	65 240.2	682.3
64	25	30.969	25	774.22	1858.11	25	46 451.5	1 25	69 317.1	770.2
	26	9	6	805.19	.12	6	48 309.6	30	73 393.9	863.5
	27	9	7	836.16	.12	7	50 167.7	35	77 470.5	962.1
	28	9	8	867.13	.13	8	52 025.8	40	81 546.9	1 066.1
	29	9	9	898.10	.13	9	53 884.0	45	85 623.3	1 175.3
64	30	30.969	30	929.07	1858.13	30	55 742.1	1 50	89 699.5	1 289.9
	31	9	1	960.04	.14	1	57 600.2	55	93 775.5	1 409.8
	32	9	2	991.01	.14	2	59 458.4	2 00	97 851	1 535
	33	9	3	1 021.97	.15	3	61 316.5	3 00	146 747	3 454
	34	9	4	1 052.94	.15	4	63 174.7	4 00	195 607	6 139
64	35	30.969	35	1 083.91	1858.16	35	65 032.8	5 00	244 418	9 590
	36	9	6	1 114.88	.16	6	66 891.0	6 00	293 169	13 807
	37	9	7	1 145.85	.16	7	68 749.1	7 00	341 848	18 788
	38	69	8	1 176.82	.17	8	70 607.3	8 00	390 443	24 532
	39	70	9	1 207.79	.17	9	72 465.5	9 00	438 942	31 037
64	40	30.970	40	1 238.76	1858.18	40	74 323.6	10 00	487 333	38 302
	41	0	1	1 269.73	.18	1	76 181.8	11 00	535 604	46 326
	42	0	2	1 300.69	.19	2	78 040.0	12 00	583 743	55 106
	43	0	3	1 331.66	.19	3	79 898.2	13 00	631 739	64 639
	44	0	4	1 362.63	.19	4	81 756.4	14 00	679 579	74 925
64	45	30.970	45	1 393.60	1858.20	45	83 614.6	15 00	727 252	85 959
	46	0	6	1 424.57	.20	6	85 472.8	16 00	774 745	97 741
	47	0	7	1 455.54	.21	7	87 331.0	17 00	822 049	110 265
	48	0	8	1 486.51	.21	8	89 189.2	18 00	869 150	123 530
	49	0	9	1 517.48	.22	9	91 047.4	19 00	916 037	137 533
64	50	30.970	50	1 548.45	1858.22	50	92 905.6	20 00	962 698	152 269
	51	0	1	1 579.41	.22	1	94 763.9	21 00	1 009 123	167 735
	52	0	2	1 610.38	.23	2	96 622.1	22 00	1 055 300	183 927
	53	1	3	1 641.35	.23	3	98 480.3	23 00	1 101 216	200 842
	54	1	4	1 672.32	.24	4	100 338.6	24 00	1 146 862	218 475
64	55	30.971	55	1 703.29	1858.24	55	102 196.8	25 00	1 192 226	236 822
	56	1	6	1 734.26	.25	6	104 055.0	26 00	1 237 296	255 879
	57	1	7	1 765.23	.25	7	105 913.3	27 00	1 282 062	275 639
	58	1	8	1 796.20	.25	8	107 771.5	28 00	1 326 512	296 100
	59	1	9	1 827.17	.26	9	109 629.8	29 00	1 370 635	317 256
64	60	30.971	60	1 858.13	1858.26	60	111 488.1	30 00	1 414 422	339 100

Latitude 65° to 66°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
65 00	13.105	26.21	39.31	52.42	65.52	78.63	91.73	104.84	117.94	786.3	1572.6	2358.9	3145.2	3931.5
1	.097	.19	.29	.39	.48	.58	.68	.77	.87	5.8	1.6	7.4	3.2	29.0
2	.089	.18	.27	.35	.44	.53	.62	.71	.80	5.3	70.6	5.9	41.2	6.6
3	.080	.16	.24	.32	.40	.48	.56	.64	.72	4.8	69.7	4.5	39.3	4.1
4	.072	.14	.22	.29	.36	.43	.50	.58	.65	4.3	8.7	3.0	7.3	21.6
65 05	13.064	26.13	39.19	52.26	65.32	78.39	91.45	104.51	117.57	783.8	1567.7	2351.5	3135.4	3919.2
6	.056	.11	.17	.22	.28	.33	.39	.45	.50	3.3	6.7	50.0	3.4	6.7
7	.048	.10	.14	.19	.24	.29	.33	.38	.43	2.9	5.7	48.6	31.4	4.3
8	.039	.08	.12	.16	.20	.24	.28	.31	.35	2.4	4.8	7.1	29.5	11.8
9	.031	.06	.09	.13	.16	.19	.22	.25	.28	1.9	3.8	5.6	7.5	09.4
65 10	13.023	26.05	39.07	52.09	65.12	78.14	91.16	104.18	117.21	781.4	1562.8	2344.2	3125.6	3906.9
11	.015	.03	.05	.06	.07	.09	.10	.12	.13	0.9	1.8	2.7	3.6	4.5
12	.007	.01	.02	2.03	5.03	8.04	1.05	4.05	7.06	80.4	60.8	41.2	21.6	902.0
13	2.999	6.00	9.00	1.99	4.99	7.99	0.99	3.99	6.99	79.9	59.9	39.7	19.7	899.6
14	.990	5.98	8.97	.96	.95	.94	.93	.92	.91	9.4	8.9	8.3	7.7	7.1
65 15	12.982	25.96	38.95	51.93	64.91	77.89	90.88	103.86	116.84	778.9	1557.9	2336.8	3115.7	3894.7
16	.974	.95	.92	.90	.87	.84	.82	.79	.77	8.4	6.9	5.3	3.8	92.2
17	.966	.93	.90	.86	.83	.80	.76	.73	.69	8.0	5.9	3.9	11.8	89.8
18	.958	.92	.87	.83	.79	.75	.70	.66	.62	7.5	5.0	2.4	09.8	7.3
19	.950	.90	.85	.80	.75	.70	.65	.60	.55	7.0	4.0	30.9	7.9	4.9
65 20	12.941	25.88	38.82	51.77	64.71	77.65	90.59	103.53	116.47	776.5	1553.0	2329.4	3105.9	3882.4
21	.933	.87	.80	.73	.67	.60	.53	.46	.40	6.0	2.0	8.0	4.0	79.9
22	.925	.85	.77	.70	.63	.55	.48	.40	.32	5.5	1.0	6.5	2.0	7.5
23	.917	.83	.75	.67	.58	.50	.42	.33	.25	5.0	50.0	5.0	100.0	5.0
24	.909	.82	.73	.63	.54	.45	.36	.27	.18	4.5	49.0	3.5	098.1	2.6
65 25	12.900	25.80	38.70	51.60	64.50	77.40	90.30	103.21	116.10	774.0	1548.0	2322.1	3096.1	3870.1
26	.892	.78	.68	.57	.46	.35	.24	.14	6.03	3.5	7.0	20.6	4.1	67.6
27	.884	.77	.65	.54	.42	.30	.19	.07	5.96	3.0	6.0	19.1	2.2	5.2
28	.876	.75	.63	.50	.38	.25	.13	3.01	.88	2.5	5.1	7.6	90.2	2.7
29	.868	.74	.60	.47	.34	.21	.07	2.94	.81	2.1	4.1	6.2	88.2	60.3
65 30	12.859	25.72	38.58	51.44	64.30	77.16	90.02	102.88	115.73	771.6	1543.1	2314.7	3086.3	3857.8
31	.851	.70	.55	.41	.26	.11	89.96	.81	.66	1.1	2.1	3.2	4.3	5.4
32	.843	.69	.53	.37	.22	.06	.90	.75	.58	0.6	1.1	1.7	2.3	2.9
33	.835	.67	.50	.34	.17	7.01	.84	.68	.51	70.1	40.2	10.3	80.3	50.4
34	.827	.65	.48	.31	.13	6.96	.79	.61	.44	69.6	39.2	08.8	78.4	48.0
65 35	12.818	25.64	38.46	51.27	64.09	76.91	89.73	102.55	115.36	769.1	1538.2	2307.3	3076.4	3845.5
36	.810	.62	.43	.24	.05	.86	.67	.48	.29	8.6	7.2	5.8	4.4	3.1
37	.802	.60	.41	.21	4.01	.81	.61	.42	.22	8.1	6.2	4.4	2.5	40.6
38	.794	.59	.38	.17	3.97	.76	.56	.35	.14	7.6	5.3	2.9	70.5	38.1
39	.786	.57	.36	.14	.93	.71	.50	.29	.07	7.1	4.3	301.4	68.5	5.7
65 40	12.777	25.55	38.33	51.11	63.89	76.66	89.44	102.22	115.00	766.6	1533.3	2299.9	3066.6	3833.2
41	.769	.54	.31	.08	.85	.61	.38	.15	4.92	6.1	2.3	8.4	4.6	30.7
42	.761	.52	.28	.04	.81	.57	.33	.09	.85	5.7	1.3	7.0	2.6	28.3
43	.753	.51	.26	1.01	.76	.52	.27	2.02	.77	5.2	30.4	5.5	60.7	5.8
44	.744	.49	.23	0.98	.72	.47	.21	1.95	.70	4.7	29.4	4.0	58.7	3.3
65 45	12.736	25.47	38.21	50.95	63.68	76.42	89.15	101.89	114.63	764.2	1528.4	2292.5	3056.7	3820.9
46	.728	.46	.18	.91	.64	.37	.10	.82	.55	3.7	7.4	91.0	4.7	18.4
47	.720	.44	.16	.88	.60	.32	9.04	.76	.48	3.2	6.4	89.6	2.8	6.0
48	.712	.42	.14	.85	.56	.27	8.98	.69	.41	2.7	5.4	8.1	50.8	3.5
49	.703	.41	.11	.81	.52	.22	.92	.63	.33	2.2	4.4	6.6	48.8	11.0
65 50	12.695	25.39	38.09	50.78	63.48	76.17	88.87	101.56	114.26	761.7	1523.4	2285.1	3046.9	3808.6
51	.687	.37	.06	.75	.44	.12	.81	.50	.18	1.2	2.4	3.7	4.9	6.1
52	.679	.36	.04	.71	.39	.07	.75	.43	.11	0.7	1.4	2.2	2.9	3.6
53	.671	.34	8.01	.68	.35	6.02	.69	.37	4.04	60.2	20.5	80.7	40.9	801.2
54	.662	.32	7.99	.65	.31	5.97	.64	.30	3.96	59.7	19.5	79.2	39.0	798.7
65 55	12.654	25.31	37.96	50.62	63.27	75.92	88.58	101.23	113.89	759.2	1518.5	2277.7	3037.0	3796.2
56	.646	.29	.94	.58	.23	.88	.52	.17	.81	8.8	7.5	6.3	5.0	3.8
57	.638	.28	.91	.55	.19	.83	.46	.10	.74	8.3	6.5	4.8	3.0	91.3
58	.629	.26	.89	.52	.15	.78	.41	1.03	.66	7.8	5.6	3.3	31.1	88.8
59	.621	.24	.86	.48	.10	.73	.35	0.97	.59	7.3	4.6	1.8	29.1	6.3
65 60	12.613	25.23	37.84	50.45	63.06	75.68	88.29	100.90	113.52	756.8	1513.6	2270.3	3027.1	3783.9

Lat.		Latitude 65° to 66°—Meridional arcs.						Latitude 65°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 65° 30′		Value of 1′	Continuous sums of minutes from latitude 65° 00′		Longitude.	X	Y
°	′	*Meters.*	″	*Meters.*	*Meters.*	′	*Meters.*	° ′	*Meters.*	*Meters.*
65	00	30.971			1858.26					
	1	1	1	30.97	.27	1	1 858.3	0 1	786.3	0.1
	2	1	2	61.95	.27	2	3 716.5	2	1 572.6	0.4
	3	1	3	92.92	.27	3	5 574.8	3	2 358.9	0.9
	4	1	4	123.89	.28	4	7 433.1	4	3 145.2	1.7
65	05	30.971	5	154.87	1858.28	5	9 291.4	0 5	3 931.5	2.6
	6	1	6	185.84	.29	6	11 149.7	6	4 717.8	3.7
	7	2	7	216.81	.29	7	13 007.9	7	5 504.0	5.1
	8	2	8	247.79	.30	8	14 866.2	8	6 290.3	6.6
	9	2	9	278.76	.30	9	16 724.5	9	7 076.5	8.4
65	10	30.972	10	309.73	1858.30	10	18 582.8	0 10	7 862.9	10.4
	11	2	1	340.70	.31	1	20 441.1	15	11 794.3	23.3
	12	2	2	371.68	.31	2	22 299.5	20	15 725.8	41.5
	13	2	3	402.65	.32	3	24 157.8	25	19 657.1	64.8
	14	2	4	433.62	.32	4	26 016.1	30	23 588.5	93.3
65	15	30.972	15	464.60	1858.33	15	27 874.4	0 35	27 519.8	127.0
	16	2	6	495.57	.33	6	29 732.7	40	31 451.1	165.8
	17	2	7	526.54	.33	7	31 591.1	45	35 382.3	209.9
	18	2	8	557.52	.34	8	33 449.4	50	39 313.4	259.1
	19	2	9	588.49	.34	9	35 307.7	55	43 244.5	313.5
65	20	30.972	20	619.46	1858.35	20	37 166.1	1 00	47 175.5	373.1
	21	2	1	650.44	.35	1	39 024.4	05	51 106.5	437.9
	22	3	2	681.41	.35	2	40 882.8	10	55 037.3	507.8
	23	3	3	712.38	.36	3	42 741.2	15	58 968.0	583.0
	24	3	4	743.36	.36	4	44 599.5	20	62 898.7	663.3
65	25	30.973	25	774.33	1858.37	25	46 457.9	1 25	66 829.2	748.8
	26	3	6	805.30	.37	6	48 316.2	30	70 759.6	839.5
	27	3	7	836.27	.38	7	50 174.6	35	74 689.9	935.4
	28	3	8	867.25	.38	8	52 033.0	40	78 620.1	1 036.4
	29	3	9	898.22	.38	9	53 891.4	45	82 550.1	1 142.6
65	30	30.973	30	929.19	1858.39	30	55 749.8	1 50	86 479.9	1 254.0
	31	3	1	960.17	.39	1	57 608.2	55	90 409.7	1 370.6
	32	3	2	991.14	.40	2	59 466.5	2 00	94 339	1 492
	33	3	3	1 022.11	.40	3	61 324.9	3 00	141 479	3 358
	34	3	4	1 053.09	.40	4	63 183.3	4 00	188 584	5 968
65	35	30.973	35	1 084.06	1858.41	35	65 041.8	5 00	235 642	9 323
	36	4	6	1 115.03	.41	6	66 900.2	6 00	282 640	13 422
	37	4	7	1 146.01	.42	7	68 758.6	7 00	329 568	18 265
	38	4	8	1 176.98	.42	8	70 617.0	8 00	376 413	23 848
	39	4	9	1 207.95	.43	9	72 475.4	9 00	423 165	30 172
65	40	30.974	40	1 238.93	1858.43	40	74 333.9	10 00	469 810	37 235
	41	4	1	1 269.90	.43	1	76 192.3	11 00	516 338	45 035
	42	4	2	1 300.87	.44	2	78 050.7	12 00	562 736	53 569
	43	4	3	1 331.84	.44	3	79 909.2	13 00	608 994	62 837
	44	4	4	1 362.82	.45	4	81 767.6	14 00	655 100	72 835
65	45	30.974	45	1 393.79	1858.45	45	83 626.1	15 00	701 041	83 561
	46	4	6	1 424.76	.45	6	85 484.5	16 00	746 807	95 012
	47	4	7	1 455.74	.46	7	87 343.0	17 00	792 387	107 186
	48	4	8	1 486.71	.46	8	89 201.4	18 00	837 768	120 079
	49	4	9	1 517.68	.47	9	91 059.9	19 00	882 939	133 688
65	50	30.975	50	1 548.66	1858.47	50	92 918.4	20 00	927 889	148 011
	51	5	1	1 579.63	.47	1	94 776.8	21 00	972 608	163 042
	52	5	2	1 610.60	.48	2	96 635.3	22 00	1 017 082	178 779
	53	5	3	1 641.58	.48	3	98 493.8	23 00	1 061 303	195 217
	54	5	4	1 672.55	.49	4	100 352.3	24 00	1 105 258	212 353
65	55	30.975	55	1 703.52	1858.49	55	102 210.8	25 00	1 148 936	230 182
	56	5	6	1 734.50	.50	6	104 069.3	26 00	1 192 327	248 699
	57	5	7	1 765.47	.50	7	105 927.8	27 00	1 235 420	267 901
	58	5	8	1 796.44	.50	8	107 786.3	28 00	1 278 203	287 782
	59	5	9	1 827.41	.51	9	109 644.8	29 00	1 320 667	308 337
65	60	30.975	60	1 858.39	1858.51	60	111 503.3	30 00	1 362 800	329 560

Latitude 66° to 67°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
66 00	12.613	25.23	37.84	50.45	63.06	75.68	88.29	100.90	113.52	756.8	1513.6	2270.3	3027.1	3783.9
1	.605	.21	.81	.42	3.02	.63	.23	.84	.44	6.3	2.6	68.8	5.1	81.4
2	.596	.19	.79	.39	2.98	.58	.17	.77	.37	5.8	1.6	7.4	3.2	78.9
3	.588	.18	.77	.35	.94	.53	.12	.71	.29	5.3	10.6	5.9	21.2	6.5
4	.580	.16	.74	.32	.90	.48	.06	.64	.22	4.8	09.6	4.4	19.2	4.0
66 05	12.572	25.14	37.72	50.29	62.86	75.43	88.00	100.57	113.15	754.3	1508.6	2262.9	3017.2	3771.5
6	.564	.13	.69	.25	.82	.38	7.95	.51	.07	3.8	7.6	1.4	5.2	69.1
7	.555	.11	.67	.22	.78	.33	.89	.44	3.00	3.3	6.6	60.0	3.3	6.6
8	.547	.09	.64	.19	.73	.28	.83	.38	2.92	2.8	5.7	58.5	11.3	4.1
9	.539	.08	.62	.15	.69	.23	.77	.31	.85	2.3	4.7	7.0	09.3	61.6
66 10	12.531	25.06	37.59	50.12	62.65	75.18	87.71	100.25	112.78	751.8	1503.7	2255.5	3007.3	3759.2
11	.522	.04	.57	.09	.61	.13	.66	.18	.70	1.3	2.7	4.0	5.4	6.7
12	.514	.03	.54	.06	.57	.08	.60	.11	.63	0.8	1.7	2.5	3.4	4.2
13	.506	.01	.52	50.02	.53	5.04	.54	100.05	.55	50.4	500.7	51.1	3001.4	51.8
14	.498	5.00	.49	49.99	.49	4.99	.48	99.98	.48	49.9	499.7	49.6	2999.4	49.3
66 15	12.489	24.98	37.47	49.96	62.45	74.94	87.43	99.91	112.40	749.4	1498.7	2248.1	2997.4	3746.8
16	.481	.96	.44	.92	.40	.89	.37	.85	.33	8.9	7.7	6.6	5.5	4.3
17	.473	.95	.42	.89	.36	.84	.31	.78	.26	8.4	6.7	5.1	3.5	41.9
18	.465	.93	.39	.86	.32	.79	.25	.72	.18	7.9	5.8	3.6	91.5	39.4
19	.456	.91	.37	.83	.28	.74	.19	.65	.11	7.4	4.8	2.1	89.5	6.9
66 20	12.448	24.90	37.34	49.79	62.24	74.69	87.14	99.58	112.03	746.9	1493.8	2240.7	2987.5	3734.4
21	.440	.88	.32	.76	.20	.64	.08	.52	1.96	6.4	2.8	39.2	5.6	32.0
22	.432	.86	.29	.73	.16	.59	7.02	.45	.89	5.9	1.8	7.7	3.6	29.5
23	.423	.85	.27	.69	.12	.54	6.96	.39	.81	5.4	90.8	6.2	81.6	7.0
24	.415	.83	.24	.66	.08	.49	.91	.32	.73	4.9	89.8	4.7	79.6	4.5
66 25	12.407	24.81	37.22	49.63	62.03	74.44	86.85	99.25	111.66	744.4	1488.8	2233.2	2977.6	3722.0
26	.399	.80	.20	.59	1.99	.39	.79	.18	.59	3.9	87.8	1.7	5.7	19.6
27	.390	.78	.17	.56	.95	.34	.73	.12	.51	3.4	6.8	30.3	3.7	7.1
28	.382	.76	.15	.53	.91	.29	.67	9.05	.44	2.9	5.9	28.8	71.7	4.6
29	.374	.75	.12	.49	.87	.24	.62	8.99	.36	2.4	4.9	7.3	69.7	12.1
66 30	12.366	24.73	37.10	49.46	61.83	74.19	86.56	98.93	111.29	741.9	1483.9	2225.8	2967.7	3709.7
31	.357	.71	.07	.43	.79	.14	.50	.86	.22	1.4	2.9	4.3	5.7	7.2
32	.349	.70	.05	.40	.75	.09	.44	.79	.14	0.9	1.9	2.8	3.8	4.7
33	.341	.68	.02	.36	.70	4.04	.38	.73	1.07	40.4	80.9	21.3	61.8	702.2
34	.332	.66	7.00	.33	.66	3.99	.33	.66	0.99	39.9	79.9	19.8	59.8	699.7
66 35	12.324	24.65	36.97	49.30	61.62	73.95	86.27	98.59	110.91	739.5	1478.9	2218.4	2957.8	3697.3
36	.316	.63	.95	.26	.58	.90	.21	.53	.84	9.0	7.9	6.9	5.8	4.8
37	.308	.62	.92	.23	.54	.85	.15	.46	.77	8.5	6.9	5.4	3.8	92.3
38	.299	.60	.90	.20	.50	.80	.10	.39	.69	8.0	5.9	3.9	51.9	89.8
39	.291	.58	.87	.16	.45	.75	6.04	.33	.62	7.5	4.9	2.4	49.9	7.3
66 40	12.283	24.57	36.85	49.13	61.41	73.70	85.98	98.26	110.55	737.0	1473.9	2210.9	2947.9	3684.9
41	.275	.55	.82	.10	.37	.65	.92	.20	.47	6.5	2.9	09.4	5.9	82.4
42	.266	.53	.80	.07	.33	.60	.86	.13	.40	6.0	1.9	7.9	3.9	79.9
43	.258	.52	.77	.03	.29	.55	.81	.06	.32	5.5	1.0	6.4	41.9	7.4
44	.250	.50	.75	9.00	.25	.50	.75	8.00	.25	5.0	70.0	4.9	39.9	4.9
66 45	12.241	24.48	36.72	48.97	61.21	73.45	85.69	97.93	110.17	734.5	1469.0	2203.5	2937.9	3672.4
46	.233	.47	.70	.93	.17	.40	.63	.87	.10	4.0	8.0	2.0	6.0	70.0
47	.225	.45	.68	.90	.12	.35	.57	.80	10.03	3.5	7.0	200.5	4.0	67.5
48	.217	.44	.65	.87	.09	.30	.52	.74	09.96	3.0	6.0	199.0	2.0	5.0
49	.208	.42	.63	.83	.04	.25	.46	.67	.88	2.5	5.0	7.5	30.0	2.5
66 50	12.200	24.40	36.60	48.80	61.00	73.20	85.40	97.60	109.80	732.0	1464.0	2196.0	2928.0	3660.0
51	.192	.38	.58	.77	0.96	.15	.34	.53	.73	1.5	3.0	4.5	6.0	57.5
52	.183	.37	.55	.73	.92	.10	.28	.47	.65	1.0	2.0	3.0	4.0	5.0
53	.175	.35	.53	.70	.88	.05	.23	.40	.58	0.5	1.0	1.5	2.0	2.6
54	.167	.33	.50	.67	.84	3.00	.17	.34	.50	30.0	60.0	90.0	20.1	50.1
66 55	12.159	24.32	36.48	48.63	60.79	72.95	85.11	97.27	109.44	729.5	1459.0	2188.5	2918.1	3647.6
56	.150	.30	.45	.60	.75	.90	5.05	.20	.35	9.0	8.0	7.1	6.1	5.1
57	.142	.28	.43	.57	.71	.85	4.99	.14	.28	8.5	7.0	5.6	4.1	2.6
58	.134	.27	.40	.53	.67	.80	.94	.07	.20	8.0	6.1	4.1	2.1	40.1
59	.125	.25	.38	.50	.63	.75	.88	7.00	.13	7.5	5.1	2.6	10.1	37.6
66 60	12.117	24.23	36.35	48.47	60.59	72.70	84.82	96.94	109.05	727.0	1454.1	2181.1	2908.1	3635.1

Lat.		Latitude 66° to 67°—Meridional arcs.						Latitude 66°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 66° 30′		Value of 1′	Continuous sums of minutes from latitude 66° 00′		Longitude.	X	Y
°	′	Meters.	″	Meters.	Meters.	′	Meters.	° ′	Meters.	Meters.
66	00	30.975			1858.51					
	1	5	1	30.98	.52	1	1 858.5	0 1	756.8	0.1
	2	5	2	61.95	.52	2	3 717.0	2	1 513.6	0.4
	3	5	3	92.93	.52	3	5 575.6	3	2 270.3	0.9
	4	5	4	123.91	.53	4	7 434.1	4	3 027.1	1.6
66	05	30.976	5	154.89	1858.53	5	9 292.6	0 5	3 783.9	2.5
	6	6	6	185.86	.54	6	11 151.1	6	4 540.7	3.6
	7	6	7	216.84	.54	7	13 009.7	7	5 297.5	4.9
	8	6	8	247.82	.54	8	14 868.2	8	6 054.2	6.4
	9	6	9	278.80	.55	9	16 726.8	9	6 811.0	8.1
66	10	30.976	10	309.77	1858.55	10	18 585.3	0 10	7 567.8	10.1
	11	6	1	340.75	.56	1	20 443.9	15	11 351.7	22.6
	12	6	2	371.73	.56	2	22 302.4	20	15 135.5	40.2
	13	6	3	402.70	.56	3	24 161.0	25	18 919.3	62.8
	14	6	4	433.68	.57	4	26 019.6	30	22 703.1	90.5
66	15	30.976	15	464.66	1858.57	15	27 878.2	0 35	26 486.8	123.2
	16	6	6	495.64	.58	6	29 736.7	40	30 270.5	160.9
	17	6	7	526.61	.58	7	31 595.3	45	34 054.2	203.6
	18	6	8	557.59	.59	8	33 453.9	50	37 837.8	251.4
	19	6	9	588.57	.59	9	35 312.5	55	41 621.3	304.2
66	20	30.977	20	619.54	1858.59	20	37 171.1	1 00	45 404.8	362.0
	21	7	1	650.52	.60	1	39 029.7	05	49 188.1	424.8
	22	7	2	681.50	.60	2	40 888.3	10	52 971.4	492.7
	23	7	3	712.48	.61	3	42 746.9	15	56 754.5	565.6
	24	7	4	743.45	.61	4	44 605.5	20	60 537.6	643.5
66	25	30.977	25	774.43	1858.61	25	46 464.1	1 25	64 320.6	726.5
	26	7	6	805.41	.62	6	48 322.7	30	68 103.5	814.4
	27	7	7	836.39	.62	7	50 181.3	35	71 886.2	907.4
	28	7	8	867.36	.63	8	52 040.0	40	75 668.8	1 005.4
	29	7	9	898.34	.63	9	53 898.6	45	79 451.3	1 108.5
66	30	30.977	30	929.32	1858.63	30	55 757.2	1 50	83 233.7	1 216.6
	31	7	1	960.29	.64	1	57 615.8	55	87 015.8	1 329.7
	32	7	2	991.27	.64	2	59 474.5	2 00	90 798	1 448
	33	7	3	1 022.25	.65	3	61 333.1	3 00	136 168	3 257
	34	8	4	1 053.23	.65	4	63 191.8	4 00	181 504	5 790
66	35	30.978	35	1 084.20	1858.65	35	65 050.4	5 00	226 793	9 045
	36	8	6	1 115.18	.66	6	66 909.1	6 00	272 024	13 022
	37	8	7	1 146.16	.66	7	68 767.7	7 00	317 187	17 719
	38	8	8	1 177.13	.67	8	70 626.4	8 00	362 269	23 136
	39	8	9	1 208.11	.67	9	72 485.1	9 00	407 259	29 271
66	40	30.978	40	1 239.09	1858.67	40	74 343.8	10 00	452 145	36 122
	41	8	1	1 270.07	.68	1	76 202.4	11 00	496 916	43 689
	42	8	2	1 301.04	.68	2	78 061.1	12 00	541 561	51 968
	43	8	3	1 332.02	.69	3	79 919.8	13 00	586 069	60 958
	44	8	4	1 363.00	.69	4	81 778.5	14 00	630 427	70 656
66	45	30.978	45	1 393.98	1858.69	45	83 637.2	15 00	674 625	81 060
	46	8	6	1 424.95	.70	6	85 495.9	16 00	718 652	92 168
	47	8	7	1 455.93	.70	7	87 354.6	17 00	762 495	103 976
	48	8	8	1 486.91	.71	8	89 213.3	18 00	806 145	116 482
	49	9	9	1 517.88	.71	9	91 072.0	19 00	849 590	129 682
66	50	30.979	50	1 548.86	1858.71	50	92 930.7	20 00	892 820	143 573
	51	9	1	1 579.84	.72	1	94 789.4	21 00	935 822	158 152
	52	9	2	1 610.82	.72	2	96 648.1	22 00	978 586	173 414
	53	9	3	1 641.79	.73	3	98 506.9	23 00	1 021 101	189 356
	54	9	4	1 672.77	.73	4	100 365.6	24 00	1 063 357	205 974
66	55	30.979	55	1 703.75	1858.73	55	102 224.3	25 00	1 105 343	223 264
	56	9	6	1 734.73	.74	6	104 083.0	26 00	1 147 048	241 221
	57	9	7	1 765.70	.74	7	105 941.8	27 00	1 188 461	259 840
	58	9	8	1 796.68	.75	8	107 800.5	28 00	1 229 571	279 118
	59	9	9	1 827.66	.75	9	109 659.3	29 00	1 270 370	299 049
66	60	30.979	60	1 858.63	1858.75	60	111 518.0	30 00	1 310 845	319 627

Latitude 67° to 68°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
67 00	12.117	24.23	36.35	48.47	60.59	72.70	84.82	96.94	109.05	727.0	1454.0	2181.1	2908.1	3635.1
1	.109	.22	.33	.44	.55	.65	.76	.87	8.98	6.5	3.1	79.6	6.1	2.7
2	.101	.20	.30	.40	.50	.60	.70	.81	.91	6.0	2.1	8.1	4.1	30.2
3	.092	.18	.28	.37	.46	.55	.65	.74	.83	5.5	1.1	6.6	2.1	27.7
4	.084	.17	.25	.34	.42	.50	.59	.67	.76	5.0	50.1	5.1	900.1	5.2
67 05	12.076	24.15	36.23	48.30	60.38	72.45	84.53	96.61	108.68	724.5	1449.1	2173.6	2898.2	3622.7
6	.067	.13	.20	.27	.34	.40	.47	.54	.61	4.0	8.1	2.1	6.2	20.2
7	.059	.12	.18	.24	.30	.35	.41	.47	.53	3.5	7.1	70.6	4.2	17.7
8	.051	.10	.15	.20	.25	.30	.35	.41	.46	3.0	6.1	69.1	2.2	5.2
9	.042	.08	.13	.17	.21	.25	.30	.34	.38	2.5	5.1	7.6	90.2	2.7
67 10	12.034	24.07	36.10	48.14	60.17	72.20	84.24	96.27	108.31	722.0	1444.1	2166.1	2888.2	3610.2
11	.026	.05	.08	.10	.13	.15	.18	.21	.23	1.5	3.1	4.6	6.2	07.7
12	.018	.04	.05	.07	.09	.11	.12	.14	.16	1.1	2.1	3.2	4.2	5.3
13	.009	.02	.03	.04	.05	.06	.07	.07	.08	0.6	1.1	1.7	2.2	2.8
14	2.001	4.00	6.00	8.00	60.01	2.01	4.01	6.01	8.01	20.1	40.1	60.2	80.2	3600.3
67 15	11.993	23.99	35.98	47.97	59.96	71.96	83.95	95.94	107.93	719.6	1439.1	2158.7	2878.2	3597.8
16	.984	.97	.95	.94	.92	.91	.89	.87	.86	9.1	8.1	7.2	6.2	5.3
17	.976	.95	.93	.90	.88	.86	.83	.81	.78	8.6	7.1	5.7	4.2	2.8
18	.968	.94	.90	.87	.84	.81	.77	.74	.71	8.1	6.1	4.2	2.2	90.3
19	.959	.92	.88	.84	.80	.76	.72	.68	.64	7.6	5.1	2.7	70.2	87.8
67 20	11.951	23.90	35.85	47.80	59.76	71.71	83.66	95.61	107.56	717.1	1434.1	2151.2	2868.3	3585.3
21	.943	.89	.83	.77	.72	.66	.60	.54	.48	6.6	3.1	49.7	6.3	2.8
22	.934	.87	.80	.74	.67	.61	.54	.48	.41	6.1	2.1	8.2	4.3	80.3
23	.926	.85	.78	.70	.63	.56	.49	.41	.33	5.6	1.1	6.7	2.3	77.8
24	.918	.84	.75	.67	.59	.51	.42	.34	.26	5.1	30.1	5.2	60.3	5.3
67 25	11.909	23.82	35.73	47.64	59.55	71.46	83.37	95.28	107.18	714.6	1429.1	2143.7	2858.3	3572.8
26	.901	.80	.70	.60	.51	.41	.31	.21	.11	4.1	8.1	2.2	6.3	70.3
27	.893	.79	.68	.57	.46	.36	.25	.14	7.03	3.6	7.1	40.7	4.3	67.8
28	.884	.77	.65	.54	.42	.31	.19	.07	6.96	3.1	6.1	39.2	2.3	5.3
29	.876	.75	.63	.50	.38	.26	.13	5.01	.88	2.6	5.1	7.7	50.3	2.8
67 30	11.868	23.74	35.60	47.47	59.34	71.21	83.07	94.94	106.81	712.1	1424.1	2136.2	2848.3	3560.3
31	.859	.72	.58	.44	.30	.16	3.02	.88	.73	1.6	3.1	4.7	6.3	57.8
32	.851	.70	.55	.40	.26	.11	2.96	.81	.66	1.1	2.1	3.2	4.3	5.3
33	.843	.69	.53	.37	.21	.06	.90	.74	.58	0.6	1.1	1.7	2.3	2.8
34	.834	.67	.50	.34	.17	1.01	.84	.68	.51	10.1	20.1	30.2	40.3	50.3
67 35	11.826	23.65	35.48	47.30	59.13	70.96	82.78	94.61	106.43	709.6	1419.1	2128.7	2838.3	3547.8
36	.818	.64	.45	.27	.09	.91	.72	.54	.36	9.1	8.1	7.2	6.3	5.3
37	.809	.62	.43	.24	.05	.86	.66	.48	.28	8.6	7.1	5.7	4.3	2.8
38	.801	.60	.40	.20	9.00	.81	.61	.41	.21	8.1	6.1	4.2	2.3	40.3
39	.793	.59	.38	.17	8.96	.76	.55	.34	.13	7.6	5.1	2.7	30.3	37.8
67 40	11.784	23.57	35.35	47.14	58.92	70.71	82.49	94.28	106.06	707.1	1414.1	2121.2	2828.3	3535.3
41	.776	.55	.33	.10	.88	.66	.43	.21	5.98	6.6	3.1	19.7	6.3	2.8
42	.768	.54	.30	.07	.84	.61	.37	.14	.91	6.1	2.1	8.2	4.3	30.3
43	.759	.52	.28	.04	.80	.56	.32	.08	.83	5.6	1.1	6.7	2.3	27.8
44	.751	.50	.25	47.00	.76	.51	.26	4.01	.76	5.1	10.1	5.2	20.3	5.3
67 45	11.743	23.49	35.23	46.97	58.71	70.46	82.20	93.94	105.68	704.6	1409.1	2113.7	2818.3	3522.8
46	.734	.47	.20	.94	.67	.41	.14	.88	.61	4.1	8.1	2.2	6.3	20.3
47	.726	.45	.18	.90	.63	.36	.08	.81	.53	3.6	7.1	10.7	4.3	17.8
48	.718	.44	.15	.87	.59	.31	2.02	.74	.46	3.1	6.1	09.2	2.3	5.3
49	.709	.42	.13	.84	.55	.26	1.97	.68	.38	2.6	5.1	7.7	10.3	2.8
67 50	11.701	23.40	35.10	46.80	58.51	70.21	81.91	93.61	105.31	702.1	1404.1	2106.2	2808.3	3510.3
51	.693	.39	.08	.77	.46	.16	.85	.54	.23	1.6	3.1	4.7	6.3	07.8
52	.684	.37	.05	.74	.42	.11	.79	.47	.16	1.1	2.1	3.2	4.3	5.3
53	.676	.35	.03	.70	.38	.06	.73	.41	.08	0.6	1.1	1.7	2.2	2.8
54	.668	.34	5.00	.67	.34	70.01	.67	.34	5.01	700.1	400.1	100.2	800.2	500.3
67 55	11.659	23.32	34.98	46.64	58.30	69.96	81.62	93.28	104.93	699.6	1399.1	2098.7	2798.2	3497.8
56	.651	.30	.95	.60	.26	.91	.56	.21	.86	9.1	8.1	7.2	6.2	5.3
57	.643	.29	.93	.57	.21	.86	.50	.14	.78	8.6	7.1	5.7	4.2	2.8
58	.634	.27	.90	.54	.17	.81	.44	.07	.71	8.1	6.1	4.2	2.2	90.3
59	.626	.26	.88	.50	.13	.76	.38	3.01	.64	7.6	5.1	2.7	90.2	87.8
67 60	11.618	23.24	34.85	46.47	58.09	69.71	81.32	92.94	104.56	697.1	1394.1	2091.2	2788.2	3485.3

Lat.		Latitude 67° to 68°—Meridional arcs.						Latitude 67°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 67° 30′		Value of 1′	Continuous sums of minutes from latitude 67° 00′		Longitude.	X	Y
°	′	Meters.	″	Meters.	Meters.	′	Meters.	° ′	Meters.	Meters.
67	00	30.979			1858.75					
	1	9	1	30.98	.76	1	1 858.8	0 1	727.1	0.1
	2	9	2	61.96	.76	2	3 717.5	2	1 454.1	0.4
	3	79	3	92.94	.77	3	5 576.3	3	2 181.1	0.9
	4	80	4	123.92	.77	4	7 435.0	4	2 908.1	1.6
67	05	30.980	5	154.91	1858.77	5	9 293.8	0 5	3 635.1	2.4
	6	0	6	185.89	.78	6	11 152.6	6	4 362.2	3.5
	7	0	7	216.87	.78	7	13 011.4	7	5 089.2	4.8
	8	0	8	247.85	.79	8	14 870.2	8	5 816.2	6.2
	9	0	9	278.83	.79	9	16 728.9	9	6 543.3	7.9
67	10	30.980	10	309.81	1858.79	10	18 587.7	0 10	7 270.3	9.7
	11	0	1	340.79	.80	1	20 446.5	15	10 905.4	21.9
	12	0	2	371.77	.80	2	22 305.3	20	14 540.5	38.9
	13	0	3	402.76	.81	3	24 164.1	25	18 175.6	60.8
	14	0	4	433.74	.81	4	26 022.9	30	21 810.6	87.6
67	15	30.980	15	464.72	1858.81	15	27 881.8	0 35	25 445.6	119.2
	16	0	6	495.70	.82	6	29 740.6	40	29 080.6	155.7
	17	0	7	526.68	.82	7	31 599.4	45	32 715.5	197.1
	18	0	8	557.66	.83	8	33 458.2	50	36 350.4	243.3
	19	0	9	588.64	.83	9	35 317.0	55	39 985.2	294.4
67	20	30.981	20	619.62	1858.83	20	37 175.9	1 00	43 619.9	350.4
	21	1	1	650.61	.84	1	39 034.7	05	47 254.5	411.2
	22	1	2	681.59	.84	2	40 893.6	10	50 889.1	476.9
	23	1	3	712.57	.84	3	42 752.4	15	54 523.5	547.5
	24	1	4	743.55	.85	4	44 611.2	20	58 157.9	622.9
67	25	30.981	25	774.53	1858.85	25	46 470.1	1 25	61 792.1	703.2
	26	1	6	805.51	.86	6	48 329.0	30	65 426.3	788.4
	27	1	7	836.49	.86	7	50 187.8	35	69 060.3	878.4
	28	1	8	867.47	.86	8	52 046.7	40	72 694.2	973.3
	29	1	9	898.46	.87	9	53 905.5	45	76 328.0	1 073.0
67	30	30.981	30	929.44	1858.87	30	55 764.4	1 50	79 961.6	1 177.4
	31	1	1	960.42	.88	1	57 623.3	55	83 595.1	1 287.1
	32	1	2	991.40	.88	2	59 482.2	2 00	87 228	1 401
	33	1	3	1 022.38	.88	3	61 341.0	3 00	130 815	3 153
	34	1	4	1 053.36	.89	4	63 199.9	4 00	174 367	5 605
67	35	30.982	35	1 084.34	1858.89	35	65 058.8	5 00	217 874	8 756
	36	2	6	1 115.32	.90	6	66 917.7	6 00	261 325	12 605
	37	2	7	1 146.30	.90	7	68 776.6	7 00	304 709	17 152
	38	2	8	1 177.29	.90	8	70 635.5	8 00	348 014	22 395
	39	2	9	1 208.27	.91	9	72 494.4	9 00	391 229	28 334
67	40	30.982	40	1 239.25	1858.91	40	74 353.3	10 00	434 343	34 966
	41	2	1	1 270.23	.92	1	76 212.2	11 00	477 345	42 289
	42	2	2	1 301.21	.92	2	78 071.2	12 00	520 224	50 303
	43	2	3	1 332.19	.92	3	79 930.1	13 00	562 969	59 004
	44	2	4	1 363.17	.93	4	81 789.0	14 00	605 568	68 391
67	45	30.982	45	1 394.15	1858.93	45	83 647.9	15 00	648 011	78 461
	46	2	6	1 425.14	.93	6	85 506.9	16 00	690 287	89 212
	47	2	7	1 456.12	.94	7	87 365.8	17 00	732 384	100 640
	48	2	8	1 487.10	.94	8	89 224.7	18 00	774 293	112 744
	49	2	9	1 518.08	.95	9	91 083.7	19 00	816 002	125 519
67	50	30.982	50	1 549.06	1858.95	50	92 942.6	20 00	857 500	138 962
	51	3	1	1 580.04	.95	1	94 801.6	21 00	898 776	153 070
	52	3	2	1 611.02	.96	2	96 660.5	22 00	939 821	167 840
	53	3	3	1 642.00	.96	3	98 519.5	23 00	980 623	183 267
	54	3	4	1 672.99	.97	4	100 378.4	24 00	1 021 173	199 348
67	55	30.983	55	1 703.97	1858.97	55	102 237.4	25 00	1 061 458	216 078
	56	3	6	1 734.95	.97	6	104 096.4	26 00	1 101 470	233 453
	57	3	7	1 765.93	.98	7	105 955.4	27 00	1 141 197	251 468
	58	3	8	1 796.91	.98	8	107 814.3	28 00	1 180 629	270 120
	59	3	9	1 827.89	.98	9	109 673.3	29 00	1 219 757	289 402
67	60	30.983	60	1 858.87	1858.99	60	111 532.3	30 00	1 258 571	309 311

Latitude 68° to 69°—arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
68 00	11.618	23.24	34.85	46.47	58.09	69.71	81.32	92.94	104.56	697.1	1394.1	2091.2	2788.2	3485.3
1	.609	.22	.83	.44	.05	.66	.26	.87	.48	6.6	3.1	89.7	6.2	2.8
2	.601	.20	.80	.40	8.01	.61	.21	.81	.41	6.1	2.1	8.2	4.2	80.3
3	.592	.18	.78	.37	7.96	.55	.15	.74	.33	5.5	1.1	6.6	2.2	77.7
4	.584	.17	.75	.34	.92	.50	.09	.67	.26	5.0	90.1	5.1	80.2	5.2
68 05	11.576	23.15	34.73	46.30	57.88	69.45	81.03	92.61	104.18	694.5	1389.1	2083.6	2778.2	3472.7
6	.567	.13	.70	.27	.84	.40	0.97	.54	.11	4.0	8.1	2.1	6.2	70.2
7	.559	.12	.68	.24	.80	.35	.91	.47	4.03	3.5	7.1	80.6	4.2	67.7
8	.551	.10	.65	.20	.75	.30	.85	.41	3.96	3.0	6.1	79.1	2.2	5.2
9	.542	.08	.63	.17	.71	.25	.80	.34	.88	2.5	5.1	7.6	70.2	2.7
68 10	11.534	23.07	34.60	46.14	57.67	69.20	80.74	92.27	103.81	692.0	1384.1	2076.1	2768.2	3460.2
11	.526	.05	.58	.10	.63	.15	.68	.21	.73	1.5	3.1	4.6	6.1	57.7
12	.517	.03	.55	.07	.59	.10	.62	.14	.66	1.0	2.1	3.1	4.1	5.2
13	.509	.02	.53	.04	.54	.05	.56	.07	.58	0.5	1.1	1.6	2.1	2.7
14	.500	3.00	.50	6.00	.50	9.00	.50	2.00	.50	90.0	80.1	70.1	60.1	50.1
68 15	11.492	22.98	34.48	45.97	57.46	68.95	80.44	91.94	103.43	689.5	1379.1	2068.6	2758.1	3447.6
16	.484	.97	.45	.93	.42	.90	.39	.87	.35	9.0	8.1	7.1	6.1	5.1
17	.475	.95	.43	.90	.38	.85	.33	.80	.28	8.5	7.1	5.6	4.1	2.6
18	.467	.93	.40	.87	.33	.80	.27	.74	.20	8.0	6.0	4.1	2.1	40.1
19	.459	.92	.38	.83	.29	.75	.21	.67	.13	7.5	5.0	2.6	50.1	37.6
68 20	11.450	22.90	34.35	45.80	57.25	68.70	80.15	91.60	103.05	687.0	1374.0	2061.0	2748.1	3435.1
21	.442	.88	.33	.77	.21	.65	.09	.54	2.98	6.5	3.0	59.5	6.0	2.6
22	.433	.87	.30	.73	.17	.60	80.03	.47	.90	6.0	2.0	8.0	4.0	30.0
23	.425	.85	.28	.70	.12	.55	79.97	.40	.83	5.5	1.0	6.5	2.0	27.5
24	.417	.83	.25	.67	.08	.50	.92	.33	.75	5.0	70.0	5.0	40.0	5.0
68 25	11.408	22.82	34.23	45.63	57.04	68.45	79.86	91.27	102.68	684.5	1369.0	2053.5	2738.0	3422.5
26	.400	.80	.20	.60	7.00	.40	.80	.20	.60	4.0	8.0	2.0	6.0	20.0
27	.392	.78	.18	.57	6.96	.35	.74	.13	.53	3.5	7.0	50.5	4.0	17.5
28	.383	.77	.15	.53	.92	.30	.69	.07	.45	3.0	6.0	49.0	2.0	5.0
29	.375	.75	.12	.50	.87	.25	.62	1.00	.37	2.5	5.0	7.5	30.0	12.4
68 30	11.366	22.73	34.10	45.47	56.83	68.20	79.56	90.93	102.30	682.0	1364.0	2046.0	2727.9	3409.9
31	.358	.72	.07	.44	.79	.15	.51	.86	.22	1.5	3.0	4.4	5.9	7.4
32	.350	.70	.05	.40	.75	.10	.45	.80	.15	1.0	2.0	2.9	3.9	4.9
33	.341	.68	.02	.37	.71	.05	.39	.73	.07	0.5	60.9	41.4	21.9	402.4
34	.333	.67	4.00	.33	.66	8.00	.33	.66	2.00	80.0	59.9	39.9	19.9	399.9
68 35	11.324	22.65	33.97	45.30	56.62	67.95	79.27	90.59	101.92	679.5	1358.9	2038.4	2717.9	3397.3
36	.316	.63	.95	.26	.58	.90	.21	.53	.84	9.0	7.9	6.9	5.9	4.8
37	.308	.62	.92	.23	.54	.85	.15	.46	.77	8.5	6.9	5.4	3.8	92.3
38	.299	.60	.90	.20	.50	.80	.10	.39	.69	8.0	5.9	3.9	11.8	89.8
39	.291	.58	.87	.16	.45	.75	9.04	.33	.62	7.5	4.9	2.4	09.8	7.3
68 40	11.283	22.57	33.85	45.13	56.41	67.70	78.98	90.26	101.54	677.0	1353.9	2030.9	2707.8	3384.8
41	.274	.55	.82	.10	.37	.64	.92	.19	.47	6.4	2.9	29.3	5.8	82.2
42	.266	.53	.80	.06	.33	.59	.86	.13	.39	5.9	1.9	7.8	3.8	79.7
43	.257	.51	.77	.03	.29	.54	.80	90.06	.32	5.4	50.9	6.3	01.8	7.2
44	.249	.50	.75	5.00	.24	.49	.74	89.99	.24	4.9	49.9	4.8	699.7	4.7
68 45	11.241	22.48	33.72	44.96	56.20	67.44	78.68	89.93	101.17	674.4	1348.9	2023.3	2697.7	3372.2
46	.232	.46	.70	.93	.16	.39	.62	.86	.09	3.9	7.9	1.8	5.7	69.6
47	.224	.45	.67	.89	.12	.34	.57	.79	1.02	3.4	6.9	20.3	3.7	7.1
48	.215	.43	.65	.86	.07	.29	.51	.72	0.94	2.9	5.8	18.8	91.7	4.6
49	.207	.42	.62	.82	6.03	.24	.45	.66	.87	2.4	4.8	7.2	89.7	62.1
68 50	11.199	22.40	33.60	44.79	55.99	67.19	78.39	89.59	100.79	671.9	1343.8	2015.7	2687.6	3359.6
51	.190	.38	.57	.76	.95	.14	.33	.52	.71	1.4	2.8	4.2	5.6	7.0
52	.182	.36	.55	.73	.91	.09	.27	.45	.64	0.9	1.8	2.7	3.6	4.5
53	.173	.35	.52	.69	.87	7.04	.21	.39	.56	70.4	40.8	11.2	81.6	52.0
54	.165	.33	.50	.66	.82	6.99	.15	.32	.49	69.9	39.8	09.7	79.6	49.5
68 55	11.156	22.31	33.47	44.63	55.78	66.94	78.09	89.25	100.41	669.4	1338.8	2008.2	2677.6	3346.9
56	.148	.30	.44	.59	.74	.89	8.04	.18	.33	8.9	7.8	6.7	5.5	4.4
57	.140	.28	.42	.56	.70	.84	7.98	.12	.26	8.4	6.8	5.1	3.5	41.9
58	.131	.26	.39	.53	.66	.79	.92	9.05	.18	7.9	5.7	3.6	71.5	39.4
59	.123	.25	.37	.49	.61	.74	.86	8.98	.11	7.4	4.7	2.1	69.5	6.9
68 60	11.114	22.23	33.34	44.46	55.57	66.69	77.80	88.92	100.03	666.9	1333.7	2000.6	2667.5	3334.3

Lat.		Latitude 68° to 69°—Meridional arcs.						Latitude 68°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 68° 30′		Value of 1′	Continuous sums of minutes from latitude 68° 00′		Longitude.	X	Y
°	′	*Meters.*	″	*Meters.*	*Meters.*	′	*Meters.*	° ′	*Meters.*	*Meters.*
68	00	30.983			1858.99					
	1	3	1	30.99	.99	1	1 859.0	0 1	697.1	0.1
	2	3	2	61.97	9.00	2	3 718.0	2	1 394.1	0.4
	3	3	3	92.96	.00	3	5 577.0	3	2 091.1	0.8
	4	3	4	123.94	.00	4	7 436.0	4	2 788.2	1.5
68	05	30.983	5	154.93	1859.01	5	9 295.0	0 5	3 485.2	2.3
	6	4	6	185.91	.01	6	11 154.0	6	4 182.3	3.4
	7	4	7	216.90	.02	7	13 013.0	7	4 879.4	4.6
	8	4	8	247.88	.02	8	14 872.0	8	5 576.4	6.0
	9	4	9	278.87	.02	9	16 731.1	9	6 273.5	7.6
68	10	30.984	10	309.85	1859.03	10	18 590.1	0 10	6 970.5	9.4
	11	4	1	340.84	.03	1	20 449.1	15	10 455.8	21.1
	12	4	2	371.82	.03	2	22 308.1	20	13 941.0	37.6
	13	4	3	402.81	.04	3	24 167.2	25	17 426.3	58.7
	14	4	4	433.79	.04	4	26 026.2	30	20 911.4	84.6
68	15	30.984	15	464.78	1859.05	15	27 885.3	0 35	24 396.6	115.1
	16	4	6	495.76	.05	6	29 744.3	40	27 881.7	150.4
	17	4	7	526.75	.05	7	31 603.4	45	31 366.7	190.3
	18	4	8	557.73	.06	8	33 462.4	50	34 851.7	235.0
	19	4	9	588.72	.06	9	35 321.5	55	38 336.6	284.3
68	20	30.984	20	619.70	1859.06	20	37 180.5	1 00	41 821.5	338.4
	21	4	1	650.69	.07	1	39 039.6	05	45 306.3	397.1
	22	5	2	681.67	.07	2	40 898.7	10	48 791.0	460.6
	23	5	3	712.66	.08	3	42 757.8	15	52 275.6	528.7
	24	5	4	743.64	.08	4	44 616.8	20	55 760.1	601.6
68	25	30.985	25	774.63	1859.08	25	46 475.9	1 25	59 244.5	679.1
	26	5	6	805.61	.09	6	48 335.0	30	62 728.8	761.4
	27	5	7	836.60	.09	7	50 194.1	35	66 213.0	848.3
	28	5	8	867.58	.10	8	52 053.2	40	69 697.1	940.0
	29	5	9	898.57	.10	9	53 912.3	45	73 181.0	1 036.3
68	30	30.985	30	929.55	1859.10	30	55 771.4	1 50	76 664.9	1 137.3
	31	5	1	960.54	.11	1	57 630.5	55	80 148.5	1 243.1
	32	5	2	991.52	.11	2	59 489.6	2 00	83 632	1 353
	33	5	3	1 022.51	.11	3	61 348.7	3 00	125 421	3 045
	34	5	4	1 053.49	.12	4	63 207.8	4 00	167 177	5 413
68	35	30.985	35	1 084.48	1859.12	35	65 066.9	5 00	208 889	8 455
	36	5	6	1 115.46	.13	6	66 926.0	6 00	250 546	12 173
	37	5	7	1 146.45	.13	7	68 785.2	7 00	292 138	16 563
	38	6	8	1 177.43	.13	8	70 644.3	8 00	333 653	21 627
	39	6	9	1 208.42	.14	9	72 503.5	9 00	375 081	27 362
68	40	30.986	40	1 239.40	1859.14	40	74 362.6	10 00	416 410	33 766
	41	6	1	1 270.39	.14	1	76 221.7	11 00	457 631	40 838
	42	6	2	1 301.37	.15	2	78 080.9	12 00	498 732	48 577
	43	6	3	1 332.36	.15	3	79 940.0	13 00	539 702	56 979
	44	6	4	1 363.34	.16	4	81 799.2	14 00	580 531	66 043
68	45	30.986	45	1 394.33	1859.16	45	83 658.3	15 00	621 207	75 767
	46	6	6	1 425.31	.16	6	85 517.5	16 00	661 722	86 148
	47	6	7	1 456.30	.17	7	87 376.7	17 00	702 062	97 183
	48	6	8	1 487.28	.17	8	89 235.8	18 00	742 219	108 869
	49	6	9	1 518.27	.17	9	91 095.0	19 00	782 182	121 204
68	50	30.986	50	1 549.25	1859.18	50	92 954.2	20 00	821 940	134 183
	51	6	1	1 580.24	.18	1	94 813.4	21 00	861 482	147 804
	52	6	2	1 611.22	.18	2	96 672.6	22 00	900 799	162 064
	53	6	3	1 642.21	.19	3	98 531.7	23 00	939 880	176 957
	54	7	4	1 673.19	.19	4	100 390.9	24 00	978 715	192 481
68	55	30.987	55	1 704.18	1859.20	55	102 250.1	25 00	1 017 294	208 632
	56	7	6	1 735.16	.20	6	104 109.3	26 00	1 055 606	225 404
	57	7	7	1 766.15	.20	7	105 968.5	27 00	1 093 642	242 795
	58	7	8	1 797.13	.21	8	107 827.7	28 00	1 131 392	260 798
	59	7	9	1 828.12	.21	9	109 686.9	29 00	1 168 845	279 411
68	60	30.987	60	1 859.10	1859.21	60	111 546.2	30 00	1 205 992	298 626

Latitude 69° to 70°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
69 00	11.114	22.23	33.34	44.46	55.57	66.69	77.80	88.92	100.03	666.9	1333.7	2000.6	2667.5	3334.3
1	.106	.21	.32	.42	.53	.64	.74	.85	99.95	6.4	2.7	1999.1	5.4	31.8
2	.098	.20	.29	.39	.49	.59	.68	.78	.88	5.9	1.7	7.6	3.4	29.3
3	.089	.18	.27	.36	.45	.54	.63	.72	.80	5.4	30.7	6.1	1.4	6.8
4	.081	.16	.24	.32	.40	.48	.56	.65	.73	4.8	29.7	4.5	59.4	4.2
69 05	11.072	22.14	33.22	44.29	55.36	66.43	77.51	88.58	99.65	664.3	1328.7	1993.0	2657.4	3321.7
6	.064	.13	.19	.26	.32	.38	.45	.51	.58	3.8	7.7	1.5	5.3	19.2
7	.055	.11	.17	.22	.28	.33	.39	.44	.50	3.3	6.7	90.0	3.3	6.6
8	.047	.09	.14	.19	.23	.28	.33	.38	.42	2.8	5.6	88.5	1.3	4.1
9	.039	.08	.12	.15	.19	.23	.27	.31	.35	2.3	4.6	7.0	49.3	11.6
69 10	11.030	22.06	33.09	44.12	55.15	66.18	77.21	88.24	99.27	661.8	1323.6	1985.4	2647.3	3309.1
11	.022	.04	.07	.09	.11	.13	.15	.17	.20	1.3	2.6	3.9	5.2	6.5
12	.013	.03	.04	.05	.07	.08	.09	.11	.12	0.8	1.6	2.4	3.2	4.0
13	.005	2.01	3.02	4.02	5.02	6.03	7.03	8.04	9.04	60.3	20.6	80.9	41.2	301.5
14	0.997	1.99	2.99	3.99	4.98	5.98	6.98	7.97	8.97	59.8	19.6	79.4	39.2	299.0
69 15	10.988	21.98	32.97	43.95	54.94	65.93	76.92	87.90	98.89	659.3	1318.6	1977.9	2637.1	3296.4
16	.980	.96	.94	.92	.90	.88	.86	.84	.82	8.8	7.6	6.3	5.1	3.9
17	.971	.94	.91	.89	.86	.83	.80	.77	.74	8.3	6.6	4.8	3.1	91.4
18	.963	.93	.89	.85	.81	.78	.74	.70	.66	7.8	5.5	3.3	31.1	88.8
19	.954	.91	.86	.82	.77	.73	.68	.63	.59	7.3	4.5	1.8	29.0	6.3
69 20	10.946	21.89	32.84	43.78	54.73	65.68	76.62	87.57	98.51	656.8	1313.5	1970.3	2627.0	3283.8
21	.938	.88	.81	.75	.69	.63	.56	.50	.44	6.3	2.5	68.8	5.0	81.3
22	.929	.86	.79	.72	.65	.57	.50	.43	.36	5.7	1.5	7.2	3.0	78.7
23	.921	.84	.76	.68	.60	.53	.44	.37	.29	5.2	10.4	5.7	20.9	6.2
24	.912	.82	.74	.65	.56	.47	.39	.30	.21	4.7	09.4	4.2	18.9	3.7
69 25	10.904	21.81	32.71	43.61	54.52	65.42	76.33	87.23	98.13	654.2	1308.4	1962.7	2616.9	3271.1
26	.895	.79	.69	.58	.48	.37	.27	.16	8.06	3.7	7.4	61.2	4.9	68.6
27	.887	.77	.66	.55	.44	.32	.21	.10	7.98	3.2	6.4	59.6	2.8	6.1
28	.878	.75	.63	.51	.39	.27	.15	7.03	.90	2.7	5.4	8.1	10.8	3.5
29	.870	.74	.61	.48	.35	.22	.09	6.96	.83	2.2	4.4	6.6	08.8	61.0
69 30	10.862	21.72	32.58	43.45	54.31	65.17	76.03	86.89	97.75	651.7	1303.4	1955.1	2606.8	3258.5
31	.853	.71	.56	.41	.27	.12	5.97	.82	.68	1.2	2.4	3.6	4.7	5.9
32	.845	.69	.53	.38	.22	.07	.91	.76	.60	0.7	1.4	2.0	2.7	3.4
33	.836	.67	.51	.35	.18	5.02	.85	.69	.53	50.2	300.3	50.5	600.7	50.9
34	.828	.66	.48	.31	.14	4.97	.79	.62	.45	49.7	299.3	49.0	598.7	48.3
69 35	10.819	21.64	32.46	43.28	54.10	64.92	75.74	86.55	97.37	649.2	1298.3	1947.5	2596.6	3245.8
36	.811	.62	.43	.24	.06	.87	.68	.49	.30	8.7	7.3	6.0	4.6	3.3
37	.802	.60	.41	.21	4.01	.81	.62	.42	.22	8.1	6.3	4.4	2.6	40.7
38	.794	.59	.38	.18	3.97	.76	.56	.35	.15	7.6	5.3	2.9	90.6	38.2
39	.786	.57	.36	.14	.93	.71	.50	.29	7.07	7.1	4.2	41.4	88.5	5.7
69 40	10.777	21.55	32.33	43.11	53.89	64.66	75.44	86.22	96.99	646.6	1293.2	1939.9	2586.5	3233.1
41	.769	.54	.31	.07	.84	.61	.38	.15	.92	6.1	2.2	8.4	4.5	30.6
42	.760	.52	.28	.04	.80	.56	.32	.08	.84	5.6	1.2	6.8	2.4	28.0
43	.752	.50	.26	3.01	.76	.51	.26	6.01	.77	5.1	90.2	5.3	80.4	5.5
44	.743	.49	.23	2.97	.72	.46	.20	5.95	.69	4.6	89.2	3.8	78.4	3.0
69 45	10.735	21.47	32.20	42.94	53.67	64.41	75.15	85.88	96.61	644.1	1288.2	1932.3	2576.3	3220.4
46	.726	.45	.18	.91	.63	.36	.08	.81	.54	3.6	7.2	30.7	4.3	17.9
47	.718	.44	.15	.87	.59	.31	5.03	.74	.46	3.1	6.2	29.2	2.3	5.4
48	.709	.42	.13	.84	.55	.26	4.97	.67	.38	2.6	5.1	7.7	70.3	2.8
49	.701	.40	.10	.80	.50	.21	.91	.61	.31	2.1	4.1	6.2	68.2	10.3
69 50	10.693	21.39	32.08	42.77	53.46	64.16	74.85	85.54	96.23	641.6	1283.1	1924.7	2566.2	3207.8
51	.684	.37	.05	.74	.42	.11	.79	.47	.16	1.0	2.1	3.1	4.2	5.2
52	.676	.35	.03	.70	.38	.05	.73	.41	.08	0.5	1.1	1.6	2.1	2.7
53	.667	.33	2.00	.67	.33	4.00	.67	.34	6.00	40.0	80.0	20.1	60.1	200.1
54	.659	.32	1.98	.63	.29	3.95	.61	.27	5.93	39.5	79.0	18.6	58.1	197.6
69 55	10.650	21.30	31.95	42.60	53.25	63.90	74.55	85.20	95.85	639.0	1278.0	1917.0	2556.0	3195.1
56	.642	.28	.92	.57	.21	.85	.49	.13	.78	8.5	7.0	5.5	4.0	2.5
57	.633	.27	.90	.53	.17	.80	.43	.07	.70	8.0	6.0	4.0	52.0	90.0
58	.625	.25	.87	.50	.12	.75	.37	5.00	.62	7.5	4.9	2.5	49.9	87.4
59	.616	.23	.85	.47	.08	.70	.31	4.93	.55	7.0	3.9	10.9	7.9	4.9
69 60	10.608	21.22	31.82	42.43	53.04	63.65	74.25	84.86	95.47	636.5	1272.9	1909.4	2545.9	3182.4

Lat.		Latitude 69° to 70°—Meridional arcs.						Latitude 69°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 69° 30′		Value of 1′	Continuous sums of minutes from latitude 69° 00′		Longitude.	X	Y
°	′	*Meters.*	″	*Meters.*	*Meters.*	′	*Meters.*	° ′	*Meters.*	*Meters.*
69	00	30.987			1859.21					
	1	7	1	30.99	.22	1	1 859.2	0 1	666.9	0.1
	2	7	2	61.98	.22	2	3 718.4	2	1 333.7	0.4
	3	7	3	92.97	.23	3	5 577.7	3	2 000.6	0.8
	4	7	4	123.95	.23	4	7 436.9	4	2 667.5	1.5
69	05	30.987	5	154.94	1859.23	5	9 296.1	0 5	3 334.3	2.3
	6	7	6	185.93	.24	6	11 155.4	6	4 001.2	3.3
	7	7	7	216.92	.24	7	13 014.6	7	4 668.1	4.4
	8	7	8	247.91	.24	8	14 873.8	8	5 334.9	5.8
	9	7	9	278.90	.25	9	16 733.1	9	6 001.8	7.3
69	10	30.988	10	309.89	1859.25	10	18 592.3	0 10	6 668.7	9.1
	11	8	1	340.88	.26	1	20 451.6	15	10 003.0	20.4
	12	8	2	371.86	.26	2	22 310.9	20	13 337.3	36.2
	13	8	3	402.85	.26	3	24 170.1	25	16 671.5	56.6
	14	8	4	433.84	.27	4	26 029.4	30	20 005.8	81.5
69	15	30.988	15	464.83	1859.27	15	27 888.6	0 35	23 340.0	110.9
	16	8	6	495.82	.27	6	29 747.9	40	26 674.1	144.9
	17	8	7	526.81	.28	7	31 607.2	45	30 008.2	183.3
	18	8	8	557.80	.28	8	33 466.5	50	33 342.3	226.3
	19	8	9	588.79	.28	9	35 325.8	55	36 676.3	273.9
69	20	30.988	20	619.77	1859.29	20	37 185.0	1 00	40 010.2	325.9
	21	8	1	650.76	.29	1	39 044.3	05	43 344.0	382.5
	22	8	2	681.75	.30	2	40 903.6	10	46 677.8	443.6
	23	8	3	712.74	.30	3	42 762.9	15	50 011.5	509.3
	24	8	4	743.73	.30	4	44 622.2	20	53 345.1	579.5
69	25	30.988	25	774.72	1859.31	25	46 481.5	1 25	56 678.6	654.2
	26	.8	6	805.71	.31	6	48 340.8	30	60 012.0	733.4
	27	9	7	836.70	.31	7	50 200.1	35	63 345.3	817.2
	28	9	8	867.68	.32	8	52 059.5	40	66 678.4	905.4
	29	9	9	898.67	.32	9	53 918.8	45	70 011.5	998.2
69	30	30.989	30	929.66	1859.32	30	55 778.1	1 50	73 344.4	1 095.6
	31	9	1	960.65	.33	1	57 637.4	55	76 677.1	1 197.4
	32	9	2	991.64	.33	2	59 496.8	2 00	80 010	1 304
	33	9	3	1 022.63	.34	3	61 356.1	3 00	119 988	2 933
	34	9	4	1 053.62	.34	4	63 215.4	4 00	159 935	5 214
69	35	30.989	35	1 084.61	1859.34	35	65 074.8	5 00	199 839	8 145
	36	9	6	1 115.59	.35	6	66 934.1	6 00	239 690	11 726
	37	9	7	1 146.58	.35	7	68 793.5	7 00	279 477	15 956
	38	9	8	1 177.57	.35	8	70 652.8	8 00	319 190	20 833
	39	9	9	1 208.56	.36	9	72 512.2	9 00	358 818	26 357
69	40	30.989	40	1 239.55	1859.36	40	74 371.5	10 00	398 352	32 526
	41	9	1	1 270.54	.36	1	76 230.9	11 00	437 779	39 338
	42	89	2	1 301.52	.37	2	78 090.3	12 00	477 090	46 792
	43	90	3	1 332.51	.37	3	79 949.6	13 00	516 275	54 885
	44	0	4	1 363.50	.37	4	81 809.0	14 00	555 322	63 615
69	45	30.990	45	1 394.49	1859.38	45	83 668.4	15 00	594 222	72 981
	46	0	6	1 425.48	.38	6	85 527.8	16 00	632 964	82 979
	47	0	7	1 456.47	.39	7	87 387.1	17 00	671 538	93 607
	48	0	8	1 487.46	.39	8	89 246.5	18 00	709 934	104 862
	49	0	9	1 518.45	.39	9	91 105.9	19 00	748 142	116 741
69	50	30.990	50	1 549.44	1859.40	50	92 965.3	20 00	786 150	129 242
	51	0	1	1 580.43	.40	1	94 824.7	21 00	823 950	142 359
	52	0	2	1 611.41	.40	2	96 684.1	22 00	861 532	156 091
	53	0	3	1 642.40	.41	3	98 543.5	23 00	898 884	170 434
	54	0	4	1 673.39	.41	4	100 402.9	24 00	935 998	185 383
69	55	30.990	55	1 704.38	1859.41	55	102 262.4	25 00	972 864	200 935
	56	0	6	1 735.37	.42	6	104 121.8	26 00	1 009 471	217 085
	57	0	7	1 766.36	.42	7	105 981.2	27 00	1 045 810	233 830
	58	0	8	1 797.35	.42	8	107 840.6	28 00	1 081 872	251 165
	59	0	9	1 828.34	.43	9	109 700.0	29 00	1 117 646	269 085
69	60	30.991	60	1 859.32	1859.43	60	111 559.5	30 00	1 153 123	287 585

Latitude 70° to 71°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
70 00	10.608	21.22	31.82	42.43	53.04	63.65	74.25	84.86	95.47	636.5	1272.9	1909.4	2545.9	3182.4
1	.599	.20	.80	.40	3.00	.60	.20	.79	.39	6.0	1.9	7.9	3.8	79.8
2	.591	.18	.77	.36	2.96	.55	.14	.73	.32	5.5	70.9	6.4	41.8	7.3
3	.582	.16	.75	.33	.91	.49	.08	.66	.24	4.9	69.9	4.8	39.8	4.7
4	.574	.15	.72	.30	.87	.44	4.02	.59	.17	4.4	8.9	3.3	7.7	72.2
70 05	10.565	21.13	31.70	42.26	52.83	63 39	73.96	84.52	95.09	633.9	1267.9	1901.8	2535.7	3169.6
6	.557	.11	.67	.23	.79	.34	.90	.46	5.01	3.4	6.9	900.3	3.7	7.1
7	.549	.10	.65	.19	.74	.29	.84	.39	4.94	2.9	5.8	898.7	31.6	4.6
8	.540	.08	.62	.16	.70	.24	.78	.32	.86	2.4	4.8	7.2	29.6	62.0
9	.532	.06	.60	.13	.66	.19	.72	.25	.79	1.9	3.8	5.7	7.6	59.5
70 10	10.523	21.05	31.57	42.09	52.62	63.14	73.66	84.18	94.71	631.4	1262.8	1894.2	2525.5	3156.9
11	.515	.03	.54	.06	.57	.09	.60	.12	.63	0.9	1.8	2.6	3.5	4.4
12	.506	.01	.52	2.02	.53	3.04	.54	4.05	.55	30.4	60.8	91.1	21.5	51.8
13	.498	1.00	.49	1.99	.49	2.99	.48	3.98	.48	29.9	59.7	89.6	19.4	49.3
14	.489	0.98	.47	.96	.45	.93	.42	.91	.40	9.3	8.7	8.0	7.4	6.7
70 15	10.481	20.96	31.44	41.92	52.40	62.88	73.36	83.85	94.33	628.8	1257.7	1886.5	2515.4	3144.2
16	.472	.94	.42	.89	.36	.83	.31	.78	.25	8.3	6.7	5.0	3.3	41.7
17	.464	.93	.39	.85	.32	.78	.25	.71	.17	7.8	5.7	3.5	11.3	39.1
18	.455	.91	.37	.82	.28	.73	.19	.64	.10	7.3	4.6	1.9	09.3	6.6
19	.447	.89	.34	.79	.23	.68	.13	.57	4.02	6.8	3.6	80.4	7.2	4.0
70 20	10.438	20.88	31.31	41.75	52.19	62.63	73.07	83.51	93.94	626.3	1252.6	1878.9	2505.2	3131.5
21	.430	.86	.29	.72	.14	.58	3.01	.44	.87	5.8	1.6	7.4	3.1	28.9
22	.421	.84	.26	.68	.11	.53	2.95	.37	.79	5.3	50.6	5.8	501.1	6.4
23	.413	.83	.24	.65	.06	.48	.89	.30	.71	4.8	49.5	4.3	499.1	3.8
24	.404	.81	.21	.61	2.02	.43	.83	.23	.64	4.3	8.5	2.8	7.0	21.3
70 25	10.396	20.79	31.19	41.58	51.98	62.37	72.77	83.17	93.56	623.7	1247.5	1871.2	2495.0	3118.7
26	.387	.77	.16	.55	.94	.32	.71	.10	.49	3.2	6.5	69.7	2.9	6.2
27	.379	.76	.14	.51	.89	.27	.65	3.03	.41	2.7	5.5	8.2	90.9	3.6
28	.370	.74	.11	.48	.85	.22	.59	2.96	.33	2.2	4.4	6.7	88.9	11.1
29	.362	.72	.09	.45	.81	.17	.53	.89	.26	1.7	3.4	5.1	6.8	08.5
70 30	10.353	20.71	31.06	41.41	51.77	62.12	72.47	82.83	93.18	621.2	1242.4	1863.6	2484.8	3106.0
31	.345	.69	.03	.38	.72	.07	.41	.76	.10	0.7	1.4	2.1	2.7	3.4
32	.336	.67	1.01	.35	.68	2.02	.35	.69	3.03	20.2	40.4	60.5	80.7	100.9
33	.328	.66	0.98	.31	.64	1.97	.29	.62	2.95	19.7	39.3	59.0	78.7	098.3
34	.319	.64	.96	.28	.60	.92	.24	.55	.87	9.2	8.3	7.5	6.6	5.8
70 35	10.311	20.62	30.93	41.24	51.55	61.86	72.17	82.48	92.80	618.6	1237.3	1855.9	2474.6	3093.2
36	.302	.60	.91	.21	.51	.81	.12	.42	.72	8.1	6.3	4.4	2.5	90.7
37	.294	.59	.88	.17	.47	.76	.06	.35	.64	7.6	5.3	2.9	70.5	88.1
38	.285	.57	.86	.14	.43	.71	2.00	.28	.57	7.1	4.2	51.3	68.5	5.6
39	.277	.55	.83	.11	.38	.66	1.94	.21	.49	6.6	3.2	49.8	6.4	3.0
70 40	10.268	20.54	30.80	41.07	51.34	61.61	71.88	82.15	92.41	616.1	1232.2	1848.3	2464.4	3080.5
41	.260	.52	.78	.04	30	.56	.82	.08	.34	5.6	1.2	6.8	2.3	77.9
42	.251	.50	.75	1.01	.26	.51	.76	2.01	.26	5.1	30.2	5.2	60.3	5.4
43	.243	.49	.73	0.97	.21	.46	.71	1.94	.18	4.6	29.1	3.7	58.3	2.8
44	.234	.47	.70	.94	.17	.41	.64	.87	.11	4.1	8.1	2.2	6.2	70.3
70 45	10.226	20.45	30.68	40.90	51.13	61.35	71.58	81.81	92.03	613.5	1227.1	1840.6	2454.2	3067.7
46	.217	.43	.65	.87	.09	.30	.52	.74	1.96	3.0	6.1	39.1	2.1	5.2
47	.209	.42	.63	.83	.04	.25	.46	.67	.88	2.5	5.1	7.6	50.1	2.6
48	.200	.40	.60	.80	1.00	.20	.40	.60	.80	2.0	4.0	6.0	48.0	60.0
49	.192	.38	.58	.77	0.96	.15	.34	.53	.73	1.5	3.0	4.5	6.0	57.5
70 50	10.183	20.37	30.55	40.73	50.92	61.10	71.28	81.46	91.65	611.0	1222.0	1833.0	2444.0	3054.9
51	.175	.35	.52	.70	.87	.05	.22	.40	.57	0.5	1.0	31.4	41.9	52.4
52	.166	.33	.50	.66	.83	1.00	.16	.33	.49	10.0	20.0	29.9	39.9	49.8
53	.158	.32	.47	.63	.79	0.95	.10	.26	.42	09.5	18.9	8.4	7.8	7.3
54	.149	.30	.45	.60	.75	.89	1.04	.19	.34	8.9	7.9	6.8	5.8	4.7
70 55	10.141	20.28	30.42	40.56	50.70	60.84	70.98	81.13	91.27	608.4	1216.9	1825.3	2433.7	3042.2
56	.132	.26	.40	.53	.66	.79	.93	1.06	.19	7.9	5.9	3.8	31.7	39.6
57	.124	.25	.37	.49	.62	.74	.87	0.99	.11	7.4	4.9	2.2	29.6	7.1
58	.115	.23	.34	.46	.58	.69	.81	.92	1.03	6.9	3.8	20.7	7.6	4.5
59	.106	.21	.32	.43	.53	.64	.75	.85	0.96	6.4	2.8	19.2	5.6	31.9
70 60	10.098	20.20	30.29	40.39	50.49	60.59	70.69	80.78	90.88	605.9	1211.8	1817.6	2423.5	3029.4

Lat.		Latitude 70° to 71°—Meridional arcs.						Latitude 70°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 70° 30′		Value of 1′	Continuous sums of minutes from latitude 70° 00′		Longitude.	X	Y
°	′	*Meters.*	″	*Meters.*	*Meters.*	′	*Meters.*	° ′	*Meters.*	*Meters.*
70	00	30.991			1859.43					
	1	1	1	30.99	.44	1	1 859.4	0 1	636.5	0.1
	2	1	2	61.98	.44	2	3 718.9	2	1 272.9	0.3
	3	1	3	92.98	.44	3	5 578.3	3	1 909.4	0.8
	4	1	4	123.97	.45	4	7 437.8	4	2 545.9	1.4
70	05	30.991	5	154.96	1859.45	5	9 297.2	0 5	3 182.4	2.2
	6	1	6	185.95	.45	6	11 156.7	6	3 818.8	3.1
	7	1	7	216.95	.46	7	13 016.1	7	4 455.3	4.3
	8	1	8	247.94	.46	8	14 875.6	8	5 091.8	5.6
	9	1	9	278.93	.46	9	16 735.0	9	5 728.2	7.0
70	10	30.991	10	309.92	1859.47	10	18 594.5	0 10	6 364.7	8.7
	11	1	1	340.92	.47	1	20 454.0	15	9 547.0	19.5
	12	1	2	371.91	.47	2	22 313.4	20	12 729.3	34.8
	13	1	3	402.90	.48	3	24 172.9	25	15 911.6	54.4
	14	1	4	433.89	.48	4	26 032.4	30	19 093.9	78.3
70	15	30.991	15	464.88	1859.49	15	27 891.9	0 35	22 276.1	106.6
	16	1	6	495.88	.49	6	29 751.4	40	25 458.3	139.2
	17	2	7	526.87	.49	7	31 610.9	45	28 640.4	176.2
	18	2	8	557.86	.50	8	33 470.3	50	31 822.5	217.5
	19	2	9	588.85	.50	9	35 329.8	55	35 004.5	263.1
70	20	30.992	20	619.85	1859.50	20	37 189.3	1 00	38 186.5	313.1
	21	2	1	650.84	.51	1	39 048.9	05	41 368.4	367.5
	22	2	2	681.83	.51	2	40 908.4	10	44 550.2	426.2
	23	2	3	712.82	.51	3	42 767.9	15	47 731.9	489.3
	24	2	4	743.81	.52	4	44 627.4	20	50 913.6	556.7
70	25	30.992	25	774.81	1859.52	25	46 486.9	1 25	54 095.1	628.5
	26	2	6	805.80	.52	6	48 346.4	30	57 276.5	704.6
	27	2	7	836.79	.53	7	50 206.0	35	60 457.9	785.0
	28	2	8	867.78	.53	8	52 065.5	40	63 639.1	869.8
	29	2	9	898.78	.53	9	53 925.0	45	66 820.2	959.0
70	30	30.992	30	929.78	1859.54	30	55 784.5	1 50	70 001.2	1 052.5
	31	2	1	960.76	.54	1	57 644.1	55	73 182.0	1 150.3
	32	2	2	991.75	.54	2	59 503.6	2 00	76 363	1 253
	33	2	3	1 022.75	.55	3	61 363.2	3 00	114 518	2 818
	34	3	4	1 053.74	.55	4	63 222.7	4 00	152 643	5 009
70	35	30.993	35	1 084.73	1859.55	35	65 082.3	5 00	190 727	7 824
	36	3	6	1 115.72	.56	6	66 941.8	6 00	228 760	11 265
	37	3	7	1 146.71	.56	7	68 801.4	7 00	266 731	15 328
	38	3	8	1 177.71	.57	8	70 661.0	8 00	304 630	20 013
	39	3	9	1 208.70	.57	9	72 520.5	9 00	342 447	25 320
70	40	30.993	40	1 239.69	1859.57	40	74 380.1	10 00	380 172	31 246
	41	3	1	1 270.68	.58	1	76 239.7	11 00	417 796	37 789
	42	3	2	1 301.68	.58	2	78 099.2	12 00	455 306	44 949
	43	3	3	1 332.67	.58	3	79 958.8	13 00	492 694	52 723
	44	3	4	1 363.66	.59	4	81 818.4	14 00	529 950	61 110
70	45	30.993	45	1 394.65	1859.59	45	83 678.0	15 00	567 063	70 106
	46	3	6	1 425.65	.59	6	85 537.6	16 00	604 023	79 709
	47	3	7	1 456.64	.60	7	87 397.2	17 00	640 821	89 918
	48	3	8	1 487.63	.60	8	89 256.8	18 00	677 447	100 728
	49	3	9	1 518.62	.60	9	91 116.4	19 00	713 891	112 138
70	50	30.993	50	1 549.61	1859.61	50	92 976.0	20 00	750 142	124 144
	51	3	1	1 580.61	.61	1	94 835.6	21 00	786 191	136 743
	52	4	2	1 611.60	.61	2	96 695.2	22 00	822 030	149 931
	53	4	3	1 642.59	.62	3	98 554.8	23 00	857 647	163 705
	54	4	4	1 673.58	.62	4	100 414.5	24 00	893 033	178 062
70	55	30.994	55	1 704.58	1859.62	55	102 274.1	25 00	928 179	192 997
	56	4	6	1 735.57	.63	6	104 133.7	26 00	963 076	208 506
	57	4	7	1 766.56	.63	7	105 993.3	27 00	997 713	224 585
	58	4	8	1 797.55	.63	8	107 853.0	28 00	1 032 082	241 231
	59	4	9	1 828.55	.64	9	109 712.6	29 00	1 066 174	258 438
70	60	30.994	60	1 859.54	1859.64	60	111 572.2	30 00	1 099 979	276 201

Latitude 71° to 72°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
71 00	10.098	20.20	30.29	40.39	50.49	60.59	70.69	80.78	90.88	605.9	1211.8	1817.6	2423.5	3029.4
1	.089	.18	.27	.36	.45	.54	.63	.71	.80	5.4	10.7	6.1	21.5	6.8
2	.081	.16	.24	.32	.40	.49	.57	.65	.73	4.9	09.7	4.6	19.4	4.3
3	.072	.14	.22	.29	.36	.43	.51	.58	.65	4.3	8.7	3.0	7.4	21.7
4	.064	.13	.19	.25	.32	.38	.45	.51	.57	3.8	7.7	1.5	5.3	19.1
71 05	10.055	20.11	30.17	40.22	50.28	60.33	70.39	80.44	90.50	603.3	1206.6	1810.0	2413.3	3016.6
6	.047	.09	.14	.19	.23	.28	.33	.37	.42	2.8	5.6	08.4	11.2	4.0
7	.038	.08	.12	.15	.19	.23	.27	.30	.34	2.2	4.6	6.9	09.2	11.5
8	.030	.06	.09	.12	.15	.18	.21	.24	.27	1.7	3.6	5.3	7.1	08.9
9	.021	.04	.06	.09	.11	.13	.15	.17	.19	1.3	2.6	3.8	5.1	6.4
71 10	10.013	20.03	30.04	40.05	50.06	60.08	70.09	80.10	90.11	600.8	1201.5	1802.3	2403.0	3003.8
11	.004	20.01	30.01	40.02	50.02	60.02	70.03	80.03	90.04	600.2	200.5	800.7	401.0	3001.2
12	9.996	19.99	29.99	39.98	49.98	59.97	69.97	79.97	89.96	599.7	199.5	799.2	398.9	2998.7
13	.987	.97	.96	.95	.93	.92	.91	.90	.88	9.2	8.4	7.7	6.9	6.1
14	.979	.96	.94	.91	.89	.87	.85	.83	.81	8.7	7.4	6.1	4.8	3.6
71 15	9.970	19.94	29.91	39.88	49.85	59.82	69.79	79.76	89.73	598.2	1196.4	1794.6	2392.8	2991.0
16	.961	.92	.88	.85	.81	.77	.73	.69	.65	7.7	5.4	3.1	90.7	88.4
17	.953	.91	.86	.81	.77	.72	.67	.62	.58	7.2	4.3	1.5	88.7	5.9
18	.944	.89	.83	.78	.72	.67	.61	.55	.50	6.7	3.3	90.0	6.6	3.3
19	.936	.87	.81	.74	.68	.61	.55	.49	.42	6.1	2.3	88.4	4.6	80.7
71 20	9.927	19.85	29.78	39.71	49.64	59.56	69.49	79.42	89.35	595.6	1191.3	1786.9	2382.5	2978.2
21	.919	.84	.76	.67	.59	.51	.43	.35	.27	5.1	90.2	5.4	80.5	5.6
22	.910	.82	.73	.64	.55	.46	.37	.28	.19	4.6	89.2	3.8	78.4	3.1
23	.902	.80	.71	.61	.51	.41	.31	.21	.12	4.1	8.2	2.3	6.4	70.5
24	.893	.79	.68	.57	.47	.36	.25	.14	9.04	3.6	7.2	80.8	4.3	67.9
71 25	9.885	19.77	29.65	39.54	49.42	59.31	69.19	79.08	88.96	593.1	1186.1	1779.2	2372.3	2965.4
26	.876	.75	.63	.50	.38	.26	.13	9.01	.88	2.6	5.1	7.7	70.2	2.8
27	.867	.73	.60	.47	.34	.20	.07	8.94	.81	2.0	4.1	6.1	68.2	60.2
28	.859	.72	.58	.44	.30	.15	9.01	.87	.73	1.5	3.1	4.6	6.1	57.7
29	.850	.70	.55	.40	.25	.10	8.95	.80	.65	1.0	2.0	3.1	4.1	5.1
71 30	9.842	19.68	29.53	39.37	49.21	59.05	68.89	78.73	88.58	590.5	1181.0	1771.5	2362.0	2952.5
31	.833	.67	.50	.33	.17	9.00	.83	.67	.50	90.0	80.0	70.0	60.0	50.0
32	.825	.65	.47	.30	.12	8.95	.77	.60	.42	89.5	79.0	68.4	57.9	47.4
33	.816	.63	.45	.26	.08	.90	.71	.53	.35	9.0	7.9	6.9	5.9	4.8
34	.808	.62	.42	.23	9.04	.85	.65	.46	.27	8.5	6.9	5.4	3.8	42.3
71 35	9.799	19.60	29.40	39.20	48.99	58.79	68.59	78.39	88.20	587.9	1175.9	1763.8	2351.8	2939.7
36	.790	.58	.37	.16	.95	.74	.53	.32	.12	7.4	4.9	2.3	49.7	7.1
37	.782	.56	.35	.13	.91	.69	.47	.26	8.04	6.9	3.8	60.7	7.7	4.6
38	.773	.55	.32	.09	.87	.64	.41	.19	7.96	6.4	2.8	59.2	5.6	32.0
39	.765	.53	.30	.06	.82	.59	.35	.12	.89	5.9	1.8	7.7	3.6	29.5
71 40	9.756	19.51	29.27	39.03	48.78	58.54	68.29	78.05	87.81	585.4	1170.8	1756.1	2341.5	2926.9
41	.748	.50	.24	8.99	.74	.49	.23	7.98	.73	4.9	69.7	4.6	39.5	4.3
42	.739	.48	.22	.96	.69	.43	.17	.91	.66	4.3	8.7	3.0	7.4	21.7
43	.731	.46	.19	.92	.65	.38	.11	.85	.58	3.8	7.7	1.5	5.3	19.2
44	.722	.44	.17	.89	.61	.33	8.05	.78	.50	3.3	6.6	50.0	3.3	6.6
71 45	9.713	19.43	29.14	38.85	48.57	58.28	67.99	77.71	87.42	582.8	1165.6	1748.4	2331.2	2914.0
46	.705	.41	.11	.82	.52	.23	.93	.64	.35	2.3	4.6	6.9	29.2	11.5
47	.696	.39	.09	.79	.48	.18	.87	.57	.27	1.8	3.6	5.3	7.1	08.9
48	.688	.38	.06	.75	.44	.13	.81	.50	.19	1.3	2.5	3.8	5.1	6.3
49	.679	.36	.04	.72	.40	.08	.76	.43	.11	0.8	1.5	2.3	3.0	3.8
71 50	9.671	19.34	29.01	38.68	48.35	58.02	67.69	77.37	87.04	580.2	1160.5	1740.7	2321.0	2901.2
51	.662	.32	8.99	.65	.31	7.97	.63	.30	6.96	79.7	59.4	39.2	18.9	898.6
52	.653	.31	.96	.61	.27	.92	.57	.23	.88	9.2	8.4	7.6	6.8	6.0
53	.645	.29	.93	.58	.22	.87	.51	.16	.81	8.7	7.4	6.1	4.8	3.5
54	.636	.27	.91	.55	.18	.82	.45	.09	.73	8.2	6.4	4.5	2.7	90.9
71 55	9.628	19.26	28.88	38.51	48.14	57.77	67.39	77.02	86.65	577.7	1155.3	1733.0	2310.7	2888.3
56	.619	.24	.86	.48	.10	.72	.34	6.95	.57	7.2	4.3	31.5	08.6	5.8
57	.611	.22	.83	.44	.05	.66	.27	.89	.50	6.6	3.3	29.9	6.6	3.2
58	.602	.20	.81	.41	8.01	.61	.21	.82	.42	6.1	2.2	8.4	4.5	80.6
59	.593	.19	.78	.37	7.96	.56	.15	.75	.34	5.6	1.2	6.8	2.4	78.0
71 60	9.585	19.17	28.75	38.34	47.92	57.51	67.09	76.68	86.26	575.1	1150.2	1725.3	2300.4	2875.5

Lat.		Latitude 71° to 72°—Meridional arcs.						Latitude 71°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 71° 30′		Value of 1′	Continuous sums of minutes from latitude 71° 00′		Longitude.	X	Y
°	′	Meters.	″	Meters.	Meters.	′	Meters.	° ′	Meters.	Meters.
71	00	30.994			1859.64					
	1	4	1	31.00	.64	1	1 859.6	0 1	605.9	0.1
	2	4	2	61.99	.65	2	3 719.3	2	1 211.8	0.3
	3	4	3	92.99	.65	3	5 578.9	3	1 817.6	0.7
	4	4	4	123.98	.65	4	7 438.6	4	2 423.5	1.3
71	05	30.994	5	154.98	1859.66	5	9 298.3	0 5	3 029.4	2.1
	6	4	6	185.97	.66	6	11 157.9	6	3 635.3	3.0
	7	4	7	216.97	.66	7	13 017.6	7	4 241.1	4.1
	8	4	8	247.97	.67	8	14 877.2	8	4 847.0	5.3
	9	5	9	278.96	.67	9	16 736.9	9	5 452.9	6.7
71	10	30.995	10	309.96	1859.67	10	18 596.6	0 10	6 058.8	8.3
	11	5	1	340.95	.68	1	20 456.3	15	9 088.1	18.7
	12	5	2	371.95	.68	2	22 315.9	20	12 117.5	33.3
	13	5	3	402.94	.68	3	24 175.6	25	15 146.8	52.1
	14	5	4	433.94	.69	4	26 035.3	30	18 176.1	75.0
71	15	30.995	15	464.94	1859.69	15	27 895.0	0 35	21 205.4	102.1
	16	5	6	495.93	.69	6	29 754.7	40	24 234.6	133.3
	17	5	7	526.93	.70	7	31 614.4	45	27 263.8	168.7
	18	5	8	557.92	.70	8	33 474.1	50	30 292.9	208.3
	19	5	9	588.92	.70	9	35 333.8	55	33 322.0	252.0
71	20	30.995	20	619.91	1859.71	20	37 193.5	1 00	36 351.0	299.9
	21	5	1	650.91	.71	1	39 053.2	05	39 379.9	352.0
	22	5	2	681.91	.71	2	40 912.9	10	42 408.8	408.3
	23	5	3	712.90	.72	3	42 772.7	15	45 437.5	468.7
	24	5	4	743.90	.72	4	44 632.4	20	48 466.2	533.2
71	25	30.995	25	774.89	1859.72	25	46 492.1	1 25	51 494.9	602.0
	26	5	6	805.89	.73	6	48 351.8	30	54 523.4	674.9
	27	6	7	836.88	.73	7	50 211.6	35	57 551.8	751.9
	28	6	8	867.88	.73	8	52 071.3	40	60 580.1	833.2
	29	6	9	898.88	.74	9	53 931.0	45	63 608.3	918.5
71	30	30.996	30	929.87	1859.74	30	55 790.8	1 50	66 636.3	1 008.1
	31	6	1	960.87	.74	1	57 650.5	55	69 664.3	1 101.8
	32	6	2	991.86	.75	2	59 510.3	2 00	72 692	1 200
	33	6	3	1 022.86	.75	3	61 370.0	3 00	109 013	2 699
	34	6	4	1 053.85	.75	4	63 229.8	4 00	145 305	4 798
71	35	30.996	35	1 084.85	1859.76	35	65 089.5	5 00	181 557	7 495
	36	6	6	1 115.84	.76	6	66 949.3	6 00	217 760	10 789
	37	6	7	1 146.84	.76	7	68 809.1	7 00	253 903	14 681
	38	6	8	1 177.84	.77	8	70 668.8	8 00	289 977	19 169
	39	6	9	1 208.83	.77	9	72 528.6	9 00	325 972	24 252
71	40	30.996	40	1 239.83	1859.77	40	74 388.4	10 00	361 879	29 927
	41	6	1	1 270.82	.78	1	76 248.1	11 00	397 686	36 195
	42	6	2	1 301.82	.78	2	78 107.9	12 00	433 386	43 052
	43	6	3	1 332.81	.78	3	79 967.7	13 00	468 967	50 498
	44	6	4	1 363.81	.79	4	81 827.5	14 00	504 421	58 530
71	45	30.997	45	1 394.81	1859.79	45	83 687.3	15 00	539 738	67 146
	46	7	6	1 425.80	.79	6	85 547.1	16 00	574 907	76 343
	47	7	7	1 456.80	.80	7	87 406.9	17 00	609 920	86 119
	48	7	8	1 487.79	.80	8	89 266.7	18 00	644 767	96 472
	49	7	9	1 518.79	.80	9	91 126.5	19 00	679 438	107 399
71	50	30.997	50	1 549.78	1859.81	50	92 986.3	20 00	713 925	118 896
	51	7	1	1 580.78	.81	1	94 846.1	21 00	748 216	130 961
	52	7	2	1 611.78	.81	2	96 705.9	22 00	782 304	143 590
	53	7	3	1 642.77	.82	3	98 565.7	23 00	816 179	156 779
	54	7	4	1 673.77	.82	4	100 425.5	24 00	849 832	170 526
71	55	30.997	55	1 704.76	1859.82	55	102 285.4	25 00	883 253	184 827
	56	7	6	1 735.76	.83	6	104 145.2	26 00	916 434	199 677
	57	7	7	1 766.75	.83	7	106 005.0	27 00	949 365	215 072
	58	7	8	1 797.75	.83	8	107 864.9	28 00	982 038	231 009
	59	7	9	1 828.75	.84	9	109 724.7	29 00	1 014 443	247 483
71	60	30.997	60	1 859.74	1859.84	60	111 584.5	30 00	1 046 572	264 489

Latitude 72° to 73°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
72 00	9.585	19.17	28.75	38.34	47.92	57.51	67.09	76.68	86.26	575.1	1150.2	1725.3	2300.4	2875.5
1	.576	.15	.73	.31	.88	.46	7.03	.61	.19	4.6	49.2	3.7	298.3	2.9
2	.568	.14	.70	.27	.84	.41	6.97	.54	.11	4.1	8.1	2.2	6.3	70.3
3	.559	.12	.68	.24	.80	.36	.92	.47	6.03	3.6	7.1	20.7	4.2	67.8
4	.551	.10	.65	.20	.75	.30	.85	.41	5.96	3.0	6.1	19.1	2.1	5.2
72 05	9.542	19.08	28.63	38.17	47.71	57.25	66.79	76.34	85.88	572.5	1145.0	1717.6	2290.1	2862.6
6	.533	.07	.60	.13	.67	.20	.73	.27	.80	2.0	4.0	6.0	88.0	60.0
7	.525	.05	.58	.10	.63	.15	.67	.20	.72	1.5	3.0	4.5	6.0	57.5
8	.516	.03	.55	.07	.58	.10	.61	.13	.65	1.0	2.0	2.9	3.9	4.9
9	.508	.02	.52	.03	.54	7.05	.55	6.06	.57	70.5	40.9	11.4	81.8	2.3
72 10	9.499	19.00	28.50	38.00	47.50	56.99	66.49	75.99	85.49	569.9	1139.9	1709.8	2279.8	2849.7
11	.491	8.98	.47	7.96	.45	.94	.43	.93	.42	9.4	8.9	8.3	7.7	7.2
12	.482	.96	.45	.93	.41	.89	.37	.86	.34	8.9	7.8	6.8	5.7	4.6
13	.473	.95	.42	.89	.37	.84	.31	.79	.26	8.4	6.8	5.2	3.6	42.0
14	.465	.93	.39	.86	.32	.79	.25	.72	.18	7.9	5.8	3.7	71.5	39.4
72 15	9.456	18.91	28.37	37.83	47.28	56.74	66.19	75.65	85.11	567.4	1134.7	1702.1	2269.5	2836.9
16	.448	.90	.34	.79	.24	.69	.13	.58	5.03	6.9	3.7	700.6	7.4	4.3
17	.439	.88	.32	.76	.20	.63	.07	.51	4.95	6.3	2.7	699.0	5.4	31.7
18	.430	.86	.29	.72	.15	.58	6.01	.44	.87	5.8	1.7	7.5	3.3	29.1
19	.422	.84	.27	.69	.11	.53	5.95	.38	.80	5.3	30.6	5.9	61.2	6.6
72 20	9.413	18.83	28.24	37.65	47.07	56.48	65.89	75.31	84.72	564.8	1129.6	1694.4	2259.2	2824.0
21	.405	.81	.21	.62	7.02	.43	.83	.24	.64	4.3	8.6	2.8	7.1	21.4
22	.396	.79	.19	.58	6.98	.38	.77	.17	.56	3.8	7.5	91.3	5.1	18.8
23	.387	.77	.16	.55	.94	.32	.71	.10	.49	3.2	6.5	89.7	3.0	6.2
24	.379	.76	.14	.52	.90	.27	.65	5.03	.41	2.7	5.5	8.2	50.9	3.7
72 25	9.370	18.74	28.11	37.48	46.85	56.22	65.59	74.96	84.33	562.2	1124.4	1686.6	2248.9	2811.1
26	.362	.72	.08	.45	.81	.17	.53	.89	.26	1.7	3.4	5.1	6.8	08.5
27	.353	.71	.06	.41	.77	.12	.47	.82	.18	1.2	2.4	3.6	4.7	5.9
28	.344	.69	.03	.38	.72	.07	.41	.75	.10	0.7	1.3	2.0	2.7	3.3
29	.336	.67	8.01	.34	.68	6.02	.35	.69	4.02	60.2	20.3	80.5	40.6	800.8
72 30	9.327	18.65	27.98	37.31	46.64	55.96	65.29	74.62	83.95	559.6	1119.3	1678.9	2238.6	2798.2
31	.319	.64	.96	.27	.59	.91	.23	.55	.87	9.1	8.2	7.4	6.5	5.6
32	.310	.62	.93	.24	.55	.86	.17	.48	.79	8.6	7.2	5.8	4.4	3.0
33	.301	.60	.90	.21	.51	.81	.11	.41	.71	8.1	6.2	4.3	2.4	90.4
34	.293	.59	.88	.17	.47	.76	5.05	.34	.64	7.6	5.1	2.7	30.3	87.9
72 35	9.284	18.57	27.85	37.14	46.42	55.71	64.99	74.27	83.56	557.1	1114.1	1671.2	2228.2	2785.3
36	.276	.55	.83	.10	.38	.65	.93	.21	.48	6.5	3.1	69.6	6.2	2.7
37	.267	.53	.80	.07	.34	.60	.87	.14	.40	6.0	2.0	8.1	4.1	80.1
38	.258	.51	.77	.03	.29	.55	.81	.07	.32	5.5	1.0	6.5	2.0	77.5
39	.250	.50	.75	7.00	.25	.50	.75	4.00	.25	5.0	10.0	5.0	20.0	5.0
72 40	9.241	18.48	27.72	36.97	46.21	55.45	64.69	73.93	83.17	554.5	1109.0	1663.4	2217.9	2772.4
41	.233	.47	.70	.93	.16	.40	.63	.86	.09	4.0	7.9	1.9	5.8	69.8
42	.224	.45	.67	.90	.12	.34	.57	.79	3.02	3.4	6.9	60.3	3.8	7.2
43	.215	.43	.65	.86	.08	.29	.51	.72	2.94	2.9	5.8	58.8	11.7	4.6
44	.207	.41	.62	.83	6.03	.24	.45	.65	.86	2.4	4.8	7.2	09.6	62.0
72 45	9.198	18.40	27.60	36.79	45.99	55.19	64.39	73.59	82.78	551.9	1103.8	1655.7	2207.6	2759.5
46	.190	.38	.57	.76	.95	.14	.33	.52	.71	1.4	2.7	4.1	5.5	6.9
47	.181	.36	.54	.72	.91	.09	.27	.45	.63	0.9	1.7	2.6	3.4	4.3
48	.172	.34	.52	.69	.86	5.03	.21	.38	.55	50.3	100.7	51.0	201.4	51.7
49	.164	.33	.49	.65	.82	4.98	.15	.31	.47	49.8	099.6	49.5	199.3	49.1
72 50	9.155	18.31	27.47	36.62	45.78	54.93	64.09	73.24	82.40	549.3	1098.6	1647.9	2197.2	2746.5
51	.147	.29	.44	.59	.73	.88	4.03	.17	.32	8.8	7.6	6.4	5.2	4.0
52	.138	.28	.41	.55	.69	.83	3.97	.10	.24	8.3	6.5	4.8	3.1	41.4
53	.129	.26	.39	.52	.65	.78	.91	3.03	.16	7.8	5.5	3.3	91.0	38.8
54	.121	.24	.36	.48	.60	.72	.84	2.97	.09	7.2	4.5	1.7	89.0	6.2
72 55	9.112	18.22	27.34	36.45	45.56	54.67	63.78	72.90	82.01	546.7	1093.4	1640.2	2186.9	2733.6
56	.103	.21	.31	.41	.52	.62	.72	.83	1.93	6.2	2.4	38.6	4.8	31.0
57	.095	.19	.28	.38	.47	.57	.66	.76	.85	5.7	1.4	7.1	2.8	28.4
58	.086	.17	.26	.35	.43	.52	.60	.69	.78	5.2	90.4	5.5	80.7	5.9
59	.078	.16	.23	.31	.39	.47	.54	.62	.70	4.7	89.3	4.0	78.6	3.3
72 60	9.069	18.14	27.21	36.28	45.35	54.41	63.48	72.55	81.62	544.1	1088.3	1632.4	2176.5	2720.7

Lat.		Latitude 72° to 73°—Meridional arcs.						Latitude 72°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 72° 30′		Value of 1′	Continuous sums of minutes from latitude 72° 00′		Longitude.	X	Y
°	′	*Meters.*	″	*Meters.*	*Meters.*	′	*Meters.*	° ′	*Meters.*	*Meters.*
72	00	30.997			1859.84					
	1	7	1	31.00	.84	1	1 859.8	0 1	575.1	0.1
	2	7	2	62.00	.85	2	3 719.7	2	1 150.2	0.3
	3	7	3	93.00	.85	3	5 579.5	3	1 725.3	0.7
	4	8	4	124.00	.85	4	7 439.4	4	2 300.4	1.3
72	05	30.998	5	154.99	1859.86	5	9 299.2	0 5	2 875.5	2.0
	6	8	6	185.99	.86	6	11 159.1	6	3 450.6	2.9
	7	8	7	216.99	.86	7	13 019.0	7	4 025.7	3.9
	8	8	8	247.99	.87	8	14 878.8	8	4 600.8	5.1
	9	8	9	278.99	.87	9	16 738.7	9	5 175.9	6.4
72	10	30.998	10	309.99	1859.87	10	18 598.6	0 10	5 751.0	8.0
	11	8	1	340.99	.88	1	20 458.4	15	8 626.4	17.9
	12	8	2	371.99	.88	2	22 318.3	20	11 501.9	31.8
	13	8	3	402.99	.88	3	24 178.2	25	14 377.3	49.7
	14	8	4	433.99	.89	4	26 038.1	30	17 252.7	71.6
72	15	30.998	15	464.98	1859.89	15	27 898.0	0 35	20 128.1	97.5
	16	8	6	495.98	.89	6	29 757.9	40	23 003.4	127.3
	17	8	7	526.98	.89	7	31 617.7	45	25 878.7	161.1
	18	8	8	557.98	.90	8	33 477.6	50	28 753.9	198.9
	19	8	9	588.99	.90	9	35 337.5	55	31 629.1	240.6
72	20	30.998	20	619.98	1859.90	20	37 197.4	1 00	34 504.2	286.4
	21	8	1	650.98	.91	1	39 057.3	05	37 379.2	336.1
	22	9	2	681.98	.91	2	40 917.3	10	40 254.2	389.8
	23	9	3	712.98	.91	3	42 777.2	15	43 129.1	447.5
	24	9	4	743.97	.92	4	44 637.1	20	46 003.9	509.1
72	25	30.999	25	774.97	1859.92	25	46 497.0	1 25	48 878.7	574.7
	26	9	6	805.97	.92	6	48 356.9	30	51 753.3	644.3
	27	9	7	836.97	.93	7	50 216.8	35	54 627.9	717.9
	28	9	8	867.97	.93	8	52 076.8	40	57 502.3	795.5
	29	9	9	898.97	.93	9	53 936.7	45	60 376.6	877.0
72	30	30.999	30	929.97	1859.94	30	55 796.6	1 50	63 250.8	962.5
	31	9	1	960.97	.94	1	57 656.6	55	66 124.9	1 052.0
	32	9	2	991.97	.94	2	59 516.5	2 00	68 999	1 145
	33	9	3	1 022.96	.95	3	61 376.5	3 00	103 475	2 577
	34	9	4	1 053.96	.95	4	63 236.4	4 00	137 922	4 580
72	35	30.999	35	1 084.96	1859.95	35	65 096.4	5 00	172 331	7 155
	36	9	6	1 115.96	.96	6	66 956.3	6 00	206 693	10 301
	37	9	7	1 146.96	.96	7	68 816.3	7 00	240 997	14 017
	38	9	8	1 177.96	.96	8	70 676.2	8 00	275 236	18 302
	39	9	9	1 208.96	.96	9	72 536.2	9 00	309 398	23 154
72	40	30.999	40	1 239.96	1859.97	40	74 396.2	10 00	343 475	28 572
	41	31.000	1	1 270.96	.97	1	76 256.1	11 00	377 458	34 556
	42	0	2	1 301.96	.97	2	78 116.1	12 00	411 337	41 103
	43	0	3	1 332.95	.98	3	79 976.1	13 00	445 102	48 211
	44	0	4	1 363.95	.98	4	81 836.1	14 00	478 745	55 879
72	45	31.000	45	1 394.95	1859.98	45	83 696.1	15 00	512 255	64 104
	46	0	6	1 425.95	.99	6	85 556.1	16 00	545 625	72 884
	47	0	7	1 456.95	.99	7	87 416.0	17 00	578 844	82 217
	48	0	8	1 487.95	59.99	8	89 276.0	18 00	611 904	92 100
	49	0	9	1 518.95	60.00	9	91 136.0	19 00	644 795	102 530
72	50	31.000	50	1 549.95	1860.00	50	92 996.0	20 00	677 509	113 505
	51	0	1	1 580.95	.00	1	94 856.0	21 00	710 036	125 021
	52	0	2	1 611.94	.01	2	96 716.0	22 00	742 367	137 075
	53	0	3	1 642.94	.01	3	98 576.0	23 00	774 494	149 665
	54	0	4	1 673.94	1860.01	4	100 436.0	24 00	806 407	162 786
72	55	31.000	55	1 704.94	.01	55	102 296.1	25 00	838 098	176 435
	56	0	6	1 735.94	.02	6	104 156.1	26 00	869 558	190 608
	57	0	7	1 766.94	.02	7	106 016.1	27 00	900 779	205 301
	58	0	8	1 797.94	.02	8	107 876.1	28 00	931 751	220 511
	59	0	9	1 828.94	.03	9	109 736.1	29 00	962 467	236 232
72	60	31.001	60	1 859.94	1860.03	0	111 596.2	30 00	992 918	252 461

Latitude 73° to 74°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
73 00	9.069	18.14	27.21	36.28	45.35	54.41	63.48	72.55	81.62	544.1	1088.3	1632.4	2176.5	2720.7
1	.060	.12	.18	.24	.30	.36	.42	.48	.54	3.6	7.2	30.9	4.5	18.1
2	.052	.10	.16	.21	.26	.31	.36	.41	.47	3.1	6.2	29.3	2.4	5.5
3	.043	.09	.13	.17	.22	.26	.30	.34	.39	2.6	5.2	7.7	70.3	2.9
4	.034	.07	.10	.14	.17	.21	.24	.27	.31	2.1	4.1	6.2	68.3	10.3
73 05	9.026	18.05	27.08	36.10	45.13	54.15	63.18	72.21	81.23	541.5	1083.1	1624.6	2166.2	2707.7
6	.017	.03	.05	.07	.09	.10	.12	.14	.16	1.0	2.1	3.1	4.1	5.2
7	.009	.02	.03	.04	.04	.05	.06	.07	.08	0.5	1.0	1.5	2.0	2.6
8	9.000	8.00	7.00	6.00	5.00	4.00	3.00	2.00	1.00	40.0	80.0	20.0	60.0	700.0
9	8.991	7.98	6.97	5.97	4.96	3.95	2.94	1.93	0.92	39.5	79.0	18.4	57.9	697.4
73 10	8.983	17.97	26.95	35.93	44.91	53.90	62.88	71.86	80.84	539.0	1077.9	1616.9	2155.8	2694.8
11	.974	.95	.92	.90	.87	.84	.82	.79	.77	8.4	6.9	5.3	3.8	92.2
12	.965	.93	.90	.86	.83	.79	.76	.72	.69	7.9	5.8	3.8	51.7	89.6
13	.957	.91	.87	.83	.78	.74	.70	.65	.61	7.4	4.8	2.2	49.6	7.0
14	.948	.90	.84	.79	.74	.69	.64	.58	.53	6.9	3.8	0.7	7.5	4.4
73 15	8.939	17.88	26.82	35.76	44.70	53.64	62.58	71.52	80.45	536.4	1072.7	1609.1	2145.5	2681.8
16	.931	.86	.79	.72	.65	.59	.52	.45	.38	5.9	1.7	7.6	3.4	79.3
17	.922	.84	.77	.69	.61	.53	.46	.38	.30	5.3	70.7	6.0	41.3	6.7
18	.914	.83	.74	.65	.57	.48	.40	.31	.22	4.8	69.6	4.4	39.3	4.1
19	.905	.81	.72	.62	.52	.43	.33	.24	.15	4.3	8.6	2.9	7.2	71.5
73 20	8.896	17.79	26.69	35.59	44.48	53.38	62.27	71.17	80.07	533.8	1067.6	1601.3	2135.1	2668.9
21	.888	.78	.66	.55	.44	.33	.21	.10	79.99	3.3	6.5	599.8	3.0	6.3
22	.879	.76	.64	.52	.39	.27	.15	1.03	.91	2.7	5.5	8.2	31.0	3.7
23	.870	.74	.61	.48	.35	.22	.09	0.96	.83	2.2	4.4	6.7	28.9	61.1
24	.862	.72	.59	.45	.31	.17	2.03	.89	.76	1.7	3.4	5.1	6.8	58.5
73 25	8.853	17.71	26.56	35.41	44.26	53.12	61.97	70.82	79.68	531.2	1062.4	1593.6	2124.7	2655.9
26	.844	.69	.53	.38	.22	.07	.91	.75	.60	0.7	1.3	2.0	2.7	3.3
27	.836	.67	.51	.34	.18	3.01	.85	.69	.52	30.1	60.3	90.4	20.6	50.7
28	.827	.65	.48	.31	.14	2.96	.79	.62	.45	29.6	59.3	88.9	18.5	48.2
29	.819	.64	.46	.27	.09	.91	.73	.55	.37	9.1	8.2	7.3	6.4	5.6
73 30	8.810	17.62	26.43	35.24	44.05	52.86	61.67	70.48	79.29	528.6	1057.2	1585.8	2114.4	2643.0
31	.801	.60	.40	.21	4.01	.81	.61	.41	.21	8.1	6.2	4.2	2.3	40.4
32	.793	.59	.38	.17	3.96	.76	.55	.34	.13	7.6	5.1	2.7	10.2	37.8
33	.784	.57	.35	.14	.92	.70	.49	.27	9.06	7.0	4.1	81.1	08.1	5.2
34	.775	.55	.33	.10	.88	.65	.43	.20	8.98	6.5	3.0	79.6	6.1	2.6
73 35	8.767	17.53	26.30	35.07	43.83	52.60	61.37	70.13	78.90	526.0	1052.0	1578.0	2104.0	2630.0
36	.758	.52	.27	.03	.79	.55	.31	70.06	.82	5.5	51.0	6.4	101.9	27.4
37	.749	.50	.25	5.00	.75	.50	.25	69.99	.74	5.0	49.9	4.9	099.8	4.8
38	.741	.48	.22	4.96	.70	.44	.18	.93	.67	4.4	8.9	3.3	7.8	22.2
39	.732	.46	.20	.93	.66	.39	.12	.86	.59	3.9	7.8	1.8	5.7	19.6
73 40	8.723	17.45	26.17	34.89	43.62	52.34	61.07	69.79	78.51	523.4	1046.8	1570.2	2093.6	2617.0
41	.715	.43	.14	.86	.57	.29	1.00	.72	.43	2.9	5.8	68.7	91.5	4.4
42	.706	.41	.12	.82	.53	.24	0.94	.65	.35	2.4	4.7	7.1	89.5	11.8
43	.697	.39	.09	.79	.49	.18	.88	.58	.28	1.8	3.7	5.5	7.4	09.2
44	.689	.38	.07	.75	.44	.13	.82	.51	.20	1.3	2.7	4.0	5.3	6.6
73 45	8.680	17.36	26.04	34.72	43.40	52.08	60.76	69.44	78.12	520.8	1041.6	1562.4	2083.2	2604.0
46	.671	.34	6.01	.69	.36	2.03	.70	.37	8.04	20.3	40.6	60.9	81.2	601.4
47	.663	.33	5.99	.65	.31	1.98	.64	.30	7.96	19.8	39.5	59.3	79.1	598.8
48	.654	.31	.96	.62	.27	.92	.58	.23	.89	9.2	8.5	7.7	7.0	6.2
49	.645	.29	.94	.58	.23	.87	.52	.16	.81	8.7	7.5	6.2	4.9	3.6
73 50	8.637	17.27	25.91	34.55	43.18	51.82	60.46	69.09	77.73	518.2	1036.4	1554.6	2072.8	2591.0
51	.628	.26	.88	.51	.14	.77	.40	9.02	.65	7.7	5.4	3.1	70.8	88.4
52	.619	.24	.86	.48	.10	.72	.34	8.95	.57	7.2	4.3	51.5	68.7	5.8
53	.611	.22	.83	.44	.05	.66	.27	.89	.50	6.6	3.3	49.9	6.6	3.2
54	.602	.20	.81	.41	3.01	.61	.22	.82	.42	6.1	2.3	8.4	4.5	80.6
73 55	8.593	17.19	25.78	34.37	42.97	51.56	60.15	68.75	77.34	515.6	1031.2	1546.8	2062.4	2578.0
56	.585	.17	.75	.34	.92	.51	.09	.68	.26	5.1	30.2	5.3	60.4	5.4
57	.576	.15	.73	.30	.88	.46	60.03	.61	.18	4.6	29.1	3.7	58.3	2.8
58	.567	.13	.70	.27	.84	.40	59.97	.54	.11	4.0	8.1	2.1	6.2	70.2
59	.559	.12	.68	.23	.79	.35	.91	.47	7.03	3.5	7.1	40.6	4.1	67.6
73 60	8.550	17.10	25.65	34.20	42.75	51.30	59.85	68.40	76.95	513.0	1026.0	1539.0	2052.0	2565.0

Lat.		Latitude 73° to 74°—Meridional arcs.						Latitude 73°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 73° 30′		Value of 1′	Continuous sums of minutes from latitude 73° 00′		Longitude.	X	Y
°	′	Meters.	″	Meters.	Meters.	′	Meters.	° ′	Meters.	Meters.
73	00	31.001			1860.03					
	1	1	1	31.00	.03	1	1 860.0	0 1	544.1	0.1
	2	1	2	62.00	.04	2	3 720.1	2	1 088.3	0.3
	3	1	3	93.01	.04	3	5 580.1	3	1 632.4	0.7
	4	1	4	124.01	.04	4	7 440.2	4	2 176.6	1.2
73	05	31.001	5	155.01	1860.05	5	9 300.2	0 5	2 720.7	1.9
	6	1	6	186.01	.05	6	11 160.2	6	3 264.8	2.7
	7	1	7	217.01	.05	7	13 020.3	7	3 809.0	3.7
	8	1	8	248.02	.05	8	14 880.4	8	4 353.1	4.8
	9	1	9	279.02	.06	9	16 740.4	9	4 897.2	6.1
73	10	31.001	10	310.02	1860.06	10	18 600.5	0 10	5 441.4	7.6
	11	1	1	341.02	.06	1	20 460.5	15	8 162.0	17.0
	12	1	2	372.02	.07	2	22 320.6	20	10 882.7	30.3
	13	1	3	403.03	.07	3	24 180.7	25	13 603.3	47.3
	14	1	4	434.03	.07	4	26 040.7	30	16 323.9	68.1
73	15	31.001	15	465.03	1860.08	15	27 900.8	0 35	19 044.5	92.7
	16	1	6	496.03	.08	6	29 760.9	40	21 765.0	121.1
	17	1	7	527.03	.08	7	31 621.0	45	24 485.5	153.3
	18	1	8	558.04	.09	8	33 481.1	50	27 206.0	189.2
	19	1	9	589.04	.09	9	35 341.1	55	29 926.4	228.9
73	20	31.002	20	620.04	1860.09	20	37 201.2	1 00	32 646.7	272.4
	21	2	1	651.04	.09	1	39 061.3	05	35 367.0	319.7
	22	2	2	682.04	.10	2	40 921.4	10	38 087.2	370.8
	23	2	3	713.05	.10	3	42 781.5	15	40 807.3	425.7
	24	2	4	744.05	.10	4	44 641.6	20	43 527.4	484.3
73	25	31.002	25	775.05	1860.11	25	46 501.7	1 25	46 247.3	546.8
	26	2	6	806.05	.11	6	48 361.8	30	48 967.2	613.0
	27	2	7	837.05	.11	7	50 221.9	35	51 687.0	683.0
	28	2	8	868.06	.12	8	52 082.1	40	54 406.7	756.8
	29	2	9	899.06	.12	9	53 942.2	45	57 126.3	834.3
73	30	31.002	30	930.06	1860.12	30	55 802.3	1 50	59 845.8	915.7
	31	2	1	961.06	.12	1	57 662.4	55	62 565.1	1 000.8
	32	2	2	992.06	.13	2	59 522.5	2 00	65 284	1 090
	33	2	3	1 023.07	.13	3	61 382.7	3 00	97 904	2 452
	34	2	4	1 054.07	.13	4	63 242.8	4 00	130 496	4 358
73	35	31.002	35	1 085.07	1860.14	35	65 102.9	5 00	163 052	6 808
	36	2	6	1 116.07	.14	6	66 963.1	6 00	195 562	9 800
	37	2	7	1 147.07	.14	7	68 823.2	7 00	228 018	13 335
	38	2	8	1 178.08	.15	8	70 683.4	8 00	260 410	17 412
	39	2	9	1 209.08	.15	9	72 543.5	9 00	292 730	22 028
73	40	31.003	40	1 240.08	1860.15	40	74 403.7	10 00	324 968	27 183
	41	3	1	1 271.08	.15	1	76 263.8	11 00	357 116	32 875
	42	3	2	1 302.09	.16	2	78 124.0	12 00	389 165	39 103
	43	3	3	1 333.09	.16	3	79 984.1	13 00	421 104	45 865
	44	3	4	1 364.09	.16	4	81 844.3	14 00	452 927	53 160
73	45	31.003	45	1 395.09	1860.17	45	83 704.5	15 00	484 623	60 984
	46	3	6	1 426.09	.17	6	85 564.6	16 00	516 185	69 336
	47	3	7	1 457.10	.17	7	87 424.8	17 00	547 602	78 214
	48	3	8	1 488.10	.18	8	89 285.0	18 00	578 868	87 615
	49	3	9	1 519.10	.18	9	91 145.2	19 00	609 971	97 537
73	50	31.003	50	1 550.10	1860.18	50	93 005.4	20 00	640 905	107 976
	51	3	1	1 581.10	.18	1	94 865.5	21 00	671 661	118 930
	52	3	2	1 612.11	.19	2	96 725.7	22 00	702 229	130 396
	53	3	3	1 643.11	.19	3	98 585.9	23 00	732 601	142 370
	54	3	4	1 674.11	.19	4	100 446.1	24 00	762 770	154 850
73	55	31.003	55	1 705.11	1860.20	55	102 306.3	25 00	792 726	167 831
	56	3	6	1 736.11	.20	6	104 166.5	26 00	822 461	181 311
	57	3	7	1 767.12	.20	7	106 026.7	27 00	851 967	195 285
	58	3	8	1 798.12	.21	8	107 886.9	28 00	881 236	209 749
	59	3	9	1 829.12	.21	9	109 747.1	29 00	910 259	224 700
73	60	31.004	60	1 860.12	1860.21	60	111 607.3	30 00	939 029	240 134

Latitude 74° to 75°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
74 00	8.550	17.10	25.65	34.20	42.75	51.30	59.85	68.40	76.95	513.0	1026.0	1539.0	2052.0	2565.0
1	.541	.08	.62	.17	.71	.25	.79	.33	.87	2.5	5.0	7.5	50.0	62.4
2	.533	.07	.60	.13	.66	.20	.73	.26	.80	2.0	3.9	5.9	47.9	59.8
3	.524	.05	.57	.10	.62	.14	.67	.19	.72	1.4	2.9	4.3	5.8	7.2
4	.515	.03	.55	.06	.58	.09	.61	.12	.64	0.9	1.9	2.8	3.7	4.6
74 05	8.507	17.01	25.52	34.03	42.53	51.04	59.55	68.06	76.56	510.4	1020.8	1531.2	2041.6	2552.0
6	.498	7.00	.49	3.99	.49	0.99	.49	7.98	.48	09.9	19.8	29.7	39.5	49.4
7	.489	6.98	.47	.96	.45	.94	.42	.92	.40	9.4	8.7	8.1	7.5	6.8
8	.481	.96	.44	.92	.41	.88	.36	.85	.33	8.8	7.7	6.5	5.4	4.2
9	.472	.94	.42	.89	.36	.83	.30	.78	.25	8.3	6.6	5.0	3.3	41.6
74 10	8.463	16.93	25.39	33.85	42.32	50.78	59.24	67.71	76.17	507.8	1015.6	1523.4	2031.2	2539.0
11	.455	.91	.36	.82	.28	.73	.18	.64	.09	7.3	4.6	1.8	29.1	6.4
12	.446	.89	.34	.78	.23	.68	.12	.57	6.01	6.8	3.5	20.3	7.0	3.8
13	.437	.87	.31	.75	.19	.62	.06	.50	5.94	6.2	2.5	18.7	5.0	31.2
14	.429	.86	.29	.71	.14	.57	9.00	.43	.86	5.7	1.4	7.2	2.9	28.6
74 15	8.420	16.84	25.26	33.68	42.10	50.52	58.94	67.36	75.78	505.2	1010.4	1515.6	2020.8	2526.0
16	.411	.82	.23	.65	.06	.47	.88	.29	.70	4.7	09.4	4.0	18.7	3.4
17	.403	.81	.21	.61	2.01	.42	.82	.22	.62	4.2	8.3	2.5	6.6	20.8
18	.394	.79	.18	.58	1.97	.36	.76	.15	.55	3.6	7.3	10.9	4.5	18.2
19	.385	.77	.16	.54	.92	.31	.70	.08	.47	3.1	6.2	09.3	2.5	5.6
74 20	8.377	16.75	25.13	33.51	41.88	50.26	58.64	67.01	75.39	502.6	1005.2	1507.8	2010.4	2513.0
21	.368	.74	.10	.47	.84	.21	.58	6.94	.31	2.1	4.1	6.2	08.3	10.4
22	.359	.72	.08	.44	.80	.16	.52	.87	.23	1.6	3.1	4.7	6.2	07.8
23	.351	.70	.05	.40	.75	.10	.46	.80	.16	1.0	2.1	3.1	4.1	5.2
24	.342	.68	.03	.37	.71	.05	.39	.73	.08	0.5	1.0	1.5	2.0	2.6
74 25	8.333	16.67	25.00	33.33	41.67	50.00	58.33	66.67	75.00	500.0	1000.0	1500.0	2000.0	2500.0
26	.324	.65	4.97	.30	.62	49.95	.27	.60	4.92	499.5	998.9	498.4	1997.9	497.3
27	.316	.63	.95	.26	.58	.89	.21	.53	.84	8.9	7.9	6.8	5.8	4.7
28	.307	.61	.92	.23	.53	.84	.15	.46	.76	8.4	6.9	5.3	3.7	92.1
29	.298	.60	.90	.19	.49	.79	.09	.39	.69	7.9	5.8	3.7	91.6	89.5
74 30	8.290	16.58	24.87	33.16	41.45	49.74	58.03	66.32	74.61	497.4	994.8	1492.2	1989.5	2486.9
31	.281	.56	.84	.12	.41	.69	7.97	.25	.53	6.9	3.7	90.6	7.5	4.3
32	.272	.54	.82	.09	.36	.63	.91	.18	.45	6.3	2.7	89.0	5.4	81.7
33	.264	.53	.79	.05	.32	.58	.85	.11	.37	5.8	1.6	7.5	3.3	79.1
34	.255	.51	.77	3.02	.27	.53	.79	6.04	.30	5.3	90.6	5.9	81.2	6.5
74 35	8.246	16.49	24.74	32.99	41.23	49.48	57.72	65.97	74.22	494.8	989.6	1484.3	1979.1	2473.9
36	.238	.48	.71	.95	.19	.43	.66	.90	.14	4.3	8.5	2.8	7.0	71.3
37	.229	.46	.69	.92	.14	.37	.60	.83	4.06	3.7	7.5	81.2	4.9	68.7
38	.220	.44	.66	.88	.10	.32	.54	.76	3.98	3.2	6.4	79.6	2.8	6.1
39	.212	.42	.64	.85	.06	.27	.48	.69	.91	2.7	5.4	8.1	70.8	3.5
74 40	8.203	16.41	24.61	32.81	41.01	49.22	57.42	65.62	73.82	492.2	984.3	1476.5	1968.7	2460.8
41	.194	.39	.58	.78	0.97	.16	.36	.55	.75	1.6	3.3	4.9	6.6	58.2
42	.185	.37	.56	.74	.92	.11	.30	.48	.67	1.1	2.2	3.4	4.5	5.6
43	.177	.35	.53	.71	.88	.06	.24	.41	.59	0.6	1.2	1.8	2.4	3.0
44	.168	.34	.50	.67	.84	9.01	.18	.34	.51	90.1	80.2	70.2	60.3	50.4
74 45	8.159	16.32	24.48	32.64	40.80	48.96	57.11	65.27	73.43	489.6	979.1	1468.7	1958.2	2447.8
46	.151	.30	.45	.60	.75	.90	7.05	.21	.36	9.0	8.1	7.1	6.1	5.2
47	.142	.28	.43	.57	.71	.85	6.99	.14	.28	8.5	7.0	5.5	4.1	2.6
48	.133	.27	.40	.53	.67	.80	.93	.07	.20	8.0	6.0	4.0	52.0	40.0
49	.124	.25	.37	.50	.62	.75	.87	5.00	.12	7.5	4.9	2.4	49.9	37.3
74 50	8.116	16.23	24.35	32.46	40.58	48.69	56.81	64.93	73.04	486.9	973.9	1460.8	1947.8	2434.7
51	.107	.21	.32	.43	.54	.64	.75	.86	2.96	6.4	2.8	59.3	5.7	32.1
52	.098	.20	.30	.39	.49	.59	.69	.79	.88	5.9	1.8	7.7	3.6	29.5
53	.090	.18	.27	.36	.45	.54	.63	.72	.81	5.4	70.8	6.1	41.5	6.9
54	.081	.16	.24	.32	.40	.49	.57	.65	.73	4.9	69.7	4.6	39.4	4.3
74 55	8.072	16.14	24.22	32.29	40.36	48.43	56.51	64.58	72.65	484.3	968.7	1453.0	1937.3	2421.7
56	.064	.13	.19	.25	.32	.38	.44	.51	.57	3.8	7.6	51.4	5.2	19.1
57	.055	.11	.16	.22	.27	.33	.38	.44	.49	3.3	6.6	49.9	3.2	6.4
58	.046	.09	.14	.18	.23	.28	.32	.37	.41	2.8	5.5	8.3	31.1	3.8
59	.037	.07	.11	.15	.19	.22	.26	.30	.34	2.2	4.5	6.7	29.0	11.2
74 60	8.029	16.06	24.09	32.11	40.14	48.17	56.20	64.23	72.26	481.7	963.4	1445.2	1926.9	2408.6

Lat.		Latitude 74° to 75°—Meridional arcs.						Latitude 74°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 74° 30′		Value of 1′	Continuous sums of minutes from latitude 74° 00′		Longitude.	X	Y
°	′	Meters.	″	Meters.	Meters.	′	Meters.	° ′	Meters.	Meters.
74	00	31.004			1860.21					
	1	4	1	31.00	.21	1	1 860.2	0 1	513.0	0.1
	2	4	2	62.01	.22	2	3 720.4	2	1 026.0	0.3
	3	4	3	93.01	.22	3	5 580.6	3	1 539.0	0.6
	4	4	4	124.02	.22	4	7 440.9	4	2 052.0	1.1
74	05	31.004	5	155.02	1860.23	5	9 301.1	0 5	2 565.1	1.8
	6	4	6	186.03	.23	6	11 161.3	6	3 078.1	2.6
	7	4	7	217.03	.23	7	13 021.5	7	3 591.1	3.5
	8	4	8	248.04	.23	8	14 881.8	8	4 104.1	4.6
	9	4	9	279.04	.24	9	16 742.0	9	4 617.1	5.8
74	10	31.004	10	310.05	1860.24	10	18 602.3	0 10	5 130.1	7.2
	11	4	1	341.05	.24	1	20 462.5	15	7 695.1	16.1
	12	4	2	372.06	.25	2	22 322.7	20	10 260.1	28.7
	13	4	3	403.06	.25	3	24 183.0	25	12 825.1	44.8
	14	4	4	434.07	.25	4	26 043.2	30	15 390.1	64.5
74	15	31.004	15	465.07	1860.25	15	27 903.5	0 35	17 955.0	87.9
	16	4	6	496.08	.26	6	29 763.7	40	20 519.9	114.8
	17	4	7	527.08	.26	7	31 624.0	45	23 084.8	145.2
	18	4	8	558.09	.26	8	33 484.3	50	25 649.6	179.3
	19	4	9	589.09	.27	9	35 344.5	55	28 214.4	217.0
74	20	31.004	20	620.10	1860.27	20	37 204.8	1 00	30 779.1	258.2
	21	5	1	651.10	.27	1	39 065.1	05	33 343.8	303.0
	22	5	2	682.11	.27	2	40 925.3	10	35 908.4	351.4
	23	5	3	713.11	.28	3	42 785.6	15	38 472.9	403.4
	24	5	4	744.12	.28	4	44 645.9	20	41 037.3	459.0
74	25	31.005	25	775.12	1860.28	25	46 506.2	1 25	43 601.7	518.2
	26	5	6	806.13	.29	6	48 366.5	30	46 166.0	580.9
	27	5	7	837.13	.29	7	50 226.8	35	48 730.1	647.3
	28	5	8	868.14	.29	8	52 087.0	40	51 294.2	717.2
	29	5	9	899.14	.29	9	53 947.3	45	53 858.2	790.7
74	30	31.005	30	930.15	1860.30	30	55 807.6	1 50	56 422.1	867.8
	31	5	1	961.15	.30	1	57 667.9	55	58 985.9	948.5
	32	5	2	992.16	.30	2	59 528.2	2 00	61 550	1 033
	33	5	3	1 023.16	.31	3	61 388.5	3 00	92 303	2 324
	34	5	4	1 054.17	.31	4	63 248.8	4 00	123 030	4 130
74	35	31.005	35	1 085.17	1860.31	35	65 109.2	5 00	153 722	6 451
	36	5	6	1 116.18	.31	6	66 969.5	6 00	184 372	9 288
	37	5	7	1 147.18	.32	7	68 829.8	7 00	214 969	12 638
	38	5	8	1 178.19	.32	8	70 690.1	8 00	245 506	16 500
	39	5	9	1 209.19	.32	9	72 550.4	9 00	275 973	20 875
74	40	31.005	40	1 240.20	1860.33	40	74 410.8	10 00	306 364	25 760
	41	5	1	1 271.20	.33	1	76 271.1	11 00	336 667	31 154
	42	6	2	1 302.21	.33	2	78 131.4	12 00	366 876	37 056
	43	6	3	1 333.21	.33	3	79 991.7	13 00	396 982	43 464
	44	6	4	1 364.22	.34	4	81 852.1	14 00	426 976	50 376
74	45	31.006	45	1 395.22	1860.34	45	83 712.4	15 00	456 850	57 790
	46	6	6	1 426.23	.34	6	85 572.8	16 00	486 596	65 705
	47	6	7	1 457.23	.35	7	87 433.1	17 00	516 204	74 117
	48	6	8	1 488.24	.35	8	89 293.5	18 00	545 667	83 025
	49	6	9	1 519.24	.35	9	91 153.8	19 00	574 976	92 426
74	50	31.006	50	1 550.25	1860.35	50	93 014.2	20 00	604 124	102 317
	51	6	1	1 581.25	.36	1	94 874.5	21 00	633 102	112 696
	52	6	2	1 612.26	.36	2	96 734.9	22 00	661 901	123 559
	53	6	3	1 643.26	.36	3	98 595.2	23 00	690 514	134 904
	54	6	4	1 674.27	.37	4	100 455.6	24 00	718 933	146 728
74	55	31.006	55	1 705.27	1860.37	55	102 316.0	25 00	747 149	159 027
	56	6	6	1 736.28	.37	6	104 176.3	26 00	775 155	171 797
	57	6	7	1 767.28	.37	7	106 036.7	27 00	802 943	185 035
	58	6	8	1 798.29	.38	8	107 897.1	28 00	830 505	198 738
	59	6	9	1 829.29	.38	9	109 757.5	29 00	857 833	212 901
74	60	31.006	60	1 860.30	1860.38	60	111 617.9	30 00	884 920	227 520

Latitude 75° to 76°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
75 00	8.029	16.06	24.09	32.11	40.14	48.17	56.20	64.23	72.26	481.7	963.4	1445.2	1926.9	2408.6
1	.020	.04	.06	.08	.10	.12	.14	.16	.18	1.2	2.4	3.6	4.8	6.0
2	.011	.02	.03	.04	.06	.07	.08	.09	.10	0.7	1.4	2.0	2.7	03.4
3	8.003	6.01	4.01	2.01	40.01	8.02	6.02	4.02	2.02	80.2	60.3	40.5	20.6	400.8
4	7.994	5.99	3.98	1.98	39.97	7.96	5.96	3.95	1.95	79.6	59.3	38.9	18.5	398.2
75 05	7.985	15.97	23.96	31.94	39.92	47.91	55.89	63.88	71.87	479.1	958.2	1437.3	1916.4	2395.5
6	.976	.95	.93	.91	.88	.86	.83	.81	.79	8.6	7.2	5.8	4.3	2.9
7	.968	.94	.90	.87	.84	.81	.77	.74	.71	8.1	6.1	4.2	2.2	90.3
8	.959	.92	.88	.84	.80	.75	.71	.67	.63	7.5	5.1	2.6	10.2	87.7
9	.950	.90	.85	.80	.75	.70	.65	.60	.55	7.0	4.0	31.0	08.1	5.1
75 10	7.942	15.88	23.82	31.77	39.71	47.65	55.59	63.53	71.47	476.5	953.0	1429.5	1906.0	2382.5
11	.933	.87	.80	.73	.66	.60	.53	.46	.39	6.0	1.9	7.9	3.9	79.8
12	.924	.85	.77	.70	.62	.54	.47	.39	.32	5.4	50.9	6.3	901.8	7.2
13	.915	.83	.75	.66	.58	.49	.41	.32	.24	4.9	49.8	4.8	899.7	4.6
14	.907	.81	.72	.63	.53	.44	.35	.25	.16	4.4	8.8	3.2	7.6	2.0
75 15	7.898	15.80	23.69	31.59	39.49	47.39	55.29	63.18	71.08	473.9	947.8	1421.6	1895.5	2369.4
16	.889	.78	.67	.56	.45	.34	.22	.11	1.00	3.4	6.7	20.1	3.4	6.8
17	.880	.76	.64	.52	.40	.28	.16	3.04	0.92	2.8	5.7	18.5	91.3	4.1
18	.872	.74	.61	.49	.36	.23	.10	2.97	.85	2.3	4.6	6.9	89.2	61.5
19	.863	.73	.59	.45	.31	.18	5.04	.90	.77	1.8	3.6	5.3	7.1	58.9
75 20	7.854	15.71	23.56	31.42	39.27	47.13	54.98	62.83	70.69	471.3	942.5	1413.8	1885.0	2356.3
21	.846	.69	.54	.38	.23	.07	.92	.76	.61	0.7	1.5	2.2	2.9	3.7
22	.837	.67	.51	.35	.18	7.02	.86	.69	.53	70.2	40.4	10.6	80.8	51.1
23	.828	.66	.48	.31	.14	6.97	.80	.62	.45	69.7	39.4	09.1	78.8	48.4
24	.819	.64	.46	.28	.10	.92	.74	.55	.37	9.2	8.3	7.5	6.7	5.8
75 25	7.811	15.62	23.43	31.24	39.05	46.86	54.67	62.49	70.30	468.6	937.3	1405.9	1874.6	2343.2
26	.802	.60	.41	.21	9.01	.81	.61	.42	.22	8.1	6.2	4.3	2.5	40.6
27	.793	.59	.38	.17	8.97	.76	.55	.35	.14	7.6	5.2	2.8	70.4	38.0
28	.784	.57	.35	.14	.92	.71	.49	.28	70.06	7.1	4.1	401.2	68.3	5.3
29	.776	.55	.33	.10	.88	.65	.43	.21	69.98	6.5	3.1	399.6	6.2	2.7
75 30	7.767	15.53	23.30	31.07	38.84	46.60	54.37	62.14	69.90	466.0	932.0	1398.1	1864.1	2330.1
31	.758	.52	.27	.03	.79	.55	.31	.07	.82	5.5	31.0	6.5	62.0	27.5
32	.750	.50	.25	1.00	.75	.50	.25	2.00	.74	5.0	29.9	4.9	59.9	4.9
33	.741	.48	.22	0.96	.70	.44	.19	1.93	.67	4.4	8.9	3.3	7.8	22.2
34	.732	.46	.20	.93	.66	.39	.12	.86	.59	3.9	7.8	1.8	5.7	19.6
75 35	7.723	15.45	23.17	30.89	38.62	46.34	54.06	61.79	69.51	463.4	926.8	1390.2	1853.6	2317.0
36	.715	.43	.14	.86	.57	.29	4.00	.72	.43	2.9	5.8	88.6	51.5	4.4
37	.706	.41	.12	.82	.53	.24	3.94	.65	.35	2.4	4.7	7.1	49.4	11.8
38	.697	.39	.09	.79	.49	.18	.88	.58	.28	1.8	3.7	5.5	7.3	09.1
39	.688	.38	.07	.75	.44	.13	.82	.51	.20	1.3	2.6	3.9	5.2	6.5
75 40	7.680	15.36	23.04	30.72	38.40	46.08	53.76	61.44	69.12	460.8	921.6	1382.3	1843.1	2303.9
41	.671	.34	3.01	.68	.36	6.03	.70	.37	9.04	60.3	20.5	80.8	41.0	301.3
42	.662	.32	2.99	.65	.31	5.97	.64	.30	8.96	59.7	19.5	79.2	38.9	298.7
43	.653	.31	.96	.61	.27	.92	.57	.23	.88	9.2	8.4	7.6	6.8	6.0
44	.645	.29	.93	.58	.22	.87	.51	.16	.80	8.7	7.4	6.0	4.7	3.4
75 45	7.636	15.27	22.91	30.54	38.18	45.82	53.45	61.09	68.72	458.2	916.3	1374.5	1832.6	2290.8
46	.627	.25	.88	.51	.14	.76	.39	1.02	.65	7.6	5.3	2.9	30.5	88.2
47	.618	.24	.86	.47	.09	.71	.33	0.95	.57	7.1	4.2	71.3	28.4	5.5
48	.610	.22	.83	.44	.05	.66	.27	.88	.49	6.6	3.2	69.8	6.3	2.9
49	.601	.20	.80	.40	8.00	.61	.21	.81	.41	6.1	2.1	8.2	4.2	80.3
75 50	7.592	15.18	22.78	30.37	37.96	45.55	53.15	60.74	68.33	455.5	911.1	1366.6	1822.1	2277.7
51	.583	.17	.75	.33	.92	.50	.08	.67	.25	5.0	10.0	5.0	20.0	5.0
52	.575	.15	.72	.30	.87	.45	3.02	.60	.17	4.5	09.0	3.5	17.9	72.4
53	.566	.13	.70	.26	.83	.40	2.96	.53	.09	4.0	7.9	1.9	5.8	69.8
54	.557	.11	.67	.23	.79	.34	.90	.46	8.02	3.4	6.9	60.3	3.7	7.2
75 55	7.548	15.10	22.65	30.19	37.74	45.29	52.84	60.39	67.94	452.9	905.8	1358.7	1811.6	2264.5
56	.540	.08	.62	.16	.70	.24	.78	.32	.86	2.4	04.8	7.2	09.5	61.9
57	.531	.06	.59	.12	.65	.19	.72	.25	.78	1.9	03.7	5.6	7.4	59.3
58	.522	.04	.57	.09	.61	.13	.65	.18	.70	1.3	02.7	4.0	5.3	6.7
59	.513	.03	.54	.05	.57	.08	.59	.11	.62	0.8	01.6	2.4	3.2	4.0
75 60	7.505	15.01	22.51	30.02	37.52	45.03	52.53	60.04	67.54	450.3	900.6	1350.9	1801.1	2251.4

Lat.		Latitude 75° to 76°—Meridional arcs.						Latitude 75°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 75° 30′		Value of 1′	Continuous sums of minutes from latitude 75° 00′		Longitude.	X	Y
°	′	*Meters.*	″	*Meters.*	*Meters.*	′	*Meters.*	° ′	*Meters.*	*Meters.*
75	00	31.006			1860.38					
	1	6	1	31.01	.38	1	1 860.4	0 1	481.7	0.1
	2	6	2	62.02	.39	2	3 720.8	2	963.4	0.3
	3	6	3	93.02	.39	3	5 581.2	3	1 445.2	0.6
	4	7	4	124.03	.39	4	7 441.5	4	1 926.9	1.1
75	05	31.007	5	155.04	1860.40	5	9 301.9	0 5	2 408.6	1.7
	6	7	6	186.05	.40	6	11 162.3	6	2 890.3	2.4
	7	7	7	217.05	.40	7	13 022.7	7	3 372.1	3.3
	8	7	8	248.06	.40	8	14 883.1	8	3 853.8	4.3
	9	7	9	279.07	.41	9	16 743.5	9	4 335.5	5.5
75	10	31.007	10	310.08	1860.41	10	18 604.0	0 10	4 817.2	6.8
	11	7	1	341.08	.41	1	20 464.4	15	7 225.8	15.2
	12	7	2	372.09	.41	2	22 324.8	20	9 634.4	27.1
	13	7	3	403.10	.42	3	24 185.2	25	12 043.0	42.3
	14	7	4	434.11	.42	4	26 045.6	30	14 451.5	60.9
75	15	31.007	15	465.12	1860.42	15	27 906.0	0 35	16 860.0	82.9
	16	7	6	496.12	.43	6	29 766.5	40	19 268.5	108.3
	17	7	7	527.13	.43	7	31 626.9	45	21 676.9	137.0
	18	7	8	558.14	.43	8	33 487.3	50	24 085.3	169.2
	19	7	9	589.15	.43	9	35 347.8	55	26 493.7	204.7
75	20	31.007	20	620.15	1860.44	20	37 208.2	1 00	28 902.0	243.6
	21	7	1	651.16	.44	1	39 068.6	05	31 310.2	285.9
	22	7	2	682.17	.44	2	40 929.1	10	33 718.4	331.6
	23	7	3	713.18	.44	3	42 789.5	15	36 126.5	380.7
	24	7	4	744.19	.45	4	44 650.0	20	38 534.5	433.1
75	25	31.007	25	775.19	1860.45	25	46 510.4	1 25	40 942.5	489.0
	26	8	6	806.20	.45	6	48 370.9	30	43 350.4	548.1
	27	8	7	837.21	.46	7	50 231.3	35	45 758.2	610.7
	28	8	8	868.22	.46	8	52 091.8	40	48 165.9	676.7
	29	8	9	899.22	.46	9	53 952.2	45	50 573.5	746.1
75	30	31.008	30	930.23	1860.46	30	55 812.7	1 50	52 981.0	818.8
	31	8	1	961.24	.47	1	57 673.2	55	55 388.4	894.9
	32	8	2	992.25	.47	2	59 533.6	2 00	57 796	975
	33	8	3	1 023.25	.47	3	61 394.1	3 00	86 673	2 192
	34	8	4	1 054.26	.47	4	63 254.6	4 00	115 526	3 897
75	35	31.008	35	1 085.27	1860.48	35	65 115.0	5 00	144 346	6 087
	36	8	6	1 116.28	.48	6	66 975.5	6 00	173 124	8 763
	37	8	7	1 147.29	.48	7	68 836.0	7 00	201 854	11 924
	38	8	8	1 178.29	.48	8	70 696.5	8 00	230 526	15 569
	39	8	9	1 209.30	.49	9	72 557.0	9 00	259 133	19 697
75	40	31.008	40	1 240.31	1860.49	40	74 417.5	10 00	287 666	24 306
	41	8	1	1 271.32	.49	1	76 278.0	11 00	316 117	29 395
	42	8	2	1 302.32	.50	2	78 138.4	12 00	344 479	34 964
	43	8	3	1 333.33	.50	3	79 998.9	13 00	372 742	41 010
	44	8	4	1 364.34	.50	4	81 859.4	14 00	400 900	47 531
75	45	31.008	45	1 395.35	1860.50	45	83 719.9	15 00	428 944	54 526
	46	8	6	1 426.36	.51	6	85 580.5	16 00	456 866	61 993
	47	8	7	1 457.36	.51	7	87 441.0	17 00	484 658	69 930
	48	9	8	1 488.37	.51	8	89 301.5	18 00	512 312	78 334
	49	9	9	1 519.38	.51	9	91 162.0	19 00	539 821	87 203
75	50	31.009	50	1 550.39	1860.52	50	93 022.5	20 00	567 176	96 534
	51	9	1	1 581.39	.52	1	94 883.0	21 00	594 370	106 325
	52	9	2	1 612.40	.52	2	96 743.6	22 00	621 395	116 574
	53	9	3	1 643.41	.52	3	98 604.1	23 00	648 243	127 276
	54	9	4	1 674.42	.53	4	100 464.6	24 00	674 907	138 430
75	55	31.009	55	1 705.42	1860.53	55	102 325.1	25 00	701 380	150 031
	56	9	6	1 736.43	.53	6	104 185.7	26 00	727 653	162 077
	57	9	7	1 767.44	.53	7	106 046.2	27 00	753 719	174 564
	58	9	8	1 798.45	.54	8	107 906.7	28 00	779 571	187 489
	59	9	9	1 829.46	.54	9	109 767.3	29 00	805 203	200 848
75	60	31.009	60	1 860.46	1860.54	60	111 627.8	30 00	830 604	214 637

Latitude 76° to 77°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
76 00	7.505	15.01	22.51	30.02	37.52	45.03	52.53	60.04	67.54	450.3	900.6	1350.9	1801.1	2251.4
1	.496	4.99	.49	29.98	.48	4.98	.47	59.97	.46	49.8	899.5	49.3	799.0	48.8
2	.487	.97	.46	.95	.44	.92	.41	.90	.38	9.2	8.5	7.7	6.9	6.2
3	.478	.96	.43	.91	.39	.87	.35	.83	.30	8.7	7.4	6.1	4.8	3.5
4	.470	.94	.41	.88	.35	.82	.29	.76	.23	8.2	6.4	4.5	2.7	40.9
76 05	7.461	14.92	22.38	29.84	37.30	44.77	52.23	59.69	67.15	447.7	895.3	1343.0	1790.6	2238.3
6	.452	.90	.36	.81	.26	.71	.16	.62	7.07	7.1	4.3	41.4	88.5	5.7
7	.443	.89	.33	.77	.22	.66	.10	.55	6.99	6.6	3.2	39.8	6.4	3.0
8	.435	.87	.30	.74	.17	.61	2.04	.48	.91	6.1	2.2	8.2	4.3	30.4
9	.426	.85	.28	.70	.13	.56	1.98	.41	.83	5.6	1.1	6.7	2.2	27.8
76 10	7.417	14.83	22.25	29.67	37.09	44.50	51.92	59.34	66.75	445.0	890.1	1335.1	1780.1	2225.2
11	.408	.82	.22	.63	.04	.45	.86	.27	.67	4.5	89.0	3.5	78.0	22.5
12	.400	.80	.20	.60	7.00	.40	.80	.20	.60	4.0	8.0	1.9	5.9	19.9
13	.391	.78	.17	.56	6.96	.35	.74	.13	.52	3.5	6.9	30.4	3.8	7.3
14	.382	.76	.15	.53	.91	.29	.67	9.06	.44	2.9	5.9	28.8	71.7	4.6
76 15	7.373	14.75	22.12	29.49	36.87	44.24	51.61	58.99	66.36	442.4	884.8	1327.2	1769.6	2212.0
16	.365	.73	.09	.46	.82	.19	.55	.92	.28	1.9	3.8	5.6	7.5	09.4
17	.356	.71	.07	.42	.78	.14	.49	.85	.20	1.4	2.7	4.1	5.4	6.8
18	.347	.69	.04	.39	.74	.08	.43	.78	.12	0.8	1.6	2.5	3.3	4.1
19	.338	.68	2.02	.35	.69	4.03	.37	.71	6.05	40.3	80.6	20.9	61.2	201.5
76 20	7.330	14.66	21.99	29.32	36.65	43.98	51.31	58.64	65.97	439.8	879.5	1319.3	1759.1	2198.9
21	.321	.64	.96	.28	.60	.92	.24	.57	.89	9.2	8.5	7.7	7.0	6.2
22	.312	.62	.94	.25	.56	.87	.18	.50	.81	8.7	7.4	6.2	4.9	3.6
23	.303	.61	.91	.21	.52	.82	.12	.43	.73	8.2	6.4	4.6	2.8	91.0
24	.295	.59	.88	.18	.47	.77	.06	.36	.65	7.7	5.3	3.0	50.7	88.4
76 25	7.286	14.57	21.86	29.14	36.43	43.71	51.00	58.29	65.57	437.1	874.3	1311.4	1748.6	2185.7
26	.277	.55	.83	.11	.39	.66	0.94	.22	.49	6.6	3.2	09.9	6.5	3.1
27	.268	.54	.81	.07	.34	.61	.88	.15	.42	6.1	2.2	8.3	4.4	80.5
28	.259	.52	.78	.04	.30	.56	.81	.08	.34	5.6	1.1	6.7	2.3	77.8
29	.251	.50	.75	9.00	.25	.50	.75	8.01	.26	5.0	70.1	5.1	40.2	5.2
76 30	7.242	14.48	21.73	28.97	36.21	43.45	50.69	57.94	65.18	434.5	869.0	1303.5	1738.1	2172.6
31	.233	.47	.70	.93	.17	.40	.63	.86	.10	4.0	8.0	2.0	5.9	69.9
32	.224	.45	.67	.90	.12	.35	.57	.79	5.02	3.5	6.9	300.4	3.8	7.3
33	.216	.43	.65	.86	.08	.29	.51	.73	4.94	2.9	5.9	298.8	31.7	4.7
34	.207	.41	.62	.83	6.03	.24	.45	.65	.86	2.4	4.8	7.2	29.6	62.0
76 35	7.198	14.40	21.59	28.79	35.99	43.19	50.39	57.58	64.78	431.9	863.8	1295.6	1727.5	2159.4
36	.189	.38	.57	.76	.95	.14	.32	.51	.70	1.4	2.7	4.1	5.4	6.8
37	.180	.36	.54	.72	.90	.08	.26	.44	.62	0.8	1.7	2.5	3.3	4.1
38	.172	.34	.51	.69	.86	3.03	.20	.37	.55	30.3	60.6	90.9	21.2	51.5
39	.163	.33	.49	.65	.81	2.98	.14	.30	.47	29.8	59.6	89.3	19.1	48.9
76 40	7.154	14.31	21.46	28.62	35.77	42.92	50.08	57.23	64.39	429.2	858.5	1287.7	1717.0	2146.2
41	.145	.29	.44	.58	.73	.87	50.02	.16	.31	8.7	7.4	6.2	4.9	3.6
42	.137	.27	.41	.55	.68	.82	49.96	.09	.23	8.2	6.4	4.6	2.8	41.0
43	.128	.26	.38	.51	.64	.77	.89	7.02	.15	7.7	5.3	3.0	10.7	38.3
44	.119	.24	.36	.48	.59	.71	.83	6.95	4.07	7.1	4.3	81.4	08.6	5.7
76 45	7.110	14.22	21.33	28.44	35.55	42.66	49.77	56.88	63.99	426.6	853.2	1279.8	1706.5	2133.1
46	.101	.20	.30	.41	.51	.61	.71	.81	.91	6.1	2.2	8.3	4.5	30.4
47	.093	.19	.28	.37	.46	.56	.65	.74	.83	5.6	1.1	6.7	2.2	27.8
48	.084	.17	.25	.34	.42	.50	.59	.67	.76	5.0	50.1	5.1	700.1	5.2
49	.075	.15	.23	.30	.37	.45	.52	.60	.68	4.5	49.0	3.5	698.0	22.5
76 50	7.066	14.13	21.20	28.27	35.33	42.40	49.46	56.53	63.60	424.0	848.0	1271.9	1695.9	2119.9
51	.058	.12	.17	.23	.29	.35	.40	.46	.52	3.5	6.9	70.4	3.8	7.3
52	.049	.10	.15	.20	.24	.29	.34	.39	.44	2.9	5.9	68.8	91.7	4.6
53	.040	.08	.12	.16	.20	.24	.28	.32	.36	2.4	4.8	7.2	89.6	12.0
54	.031	.06	.09	.13	.16	.19	.22	.25	.28	1.9	3.7	5.6	7.5	09.4
76 55	7.022	14.04	21.07	28.09	35.11	42.13	49.16	56.18	63.20	421.3	842.7	1264.0	1685.4	2106.7
56	.014	.03	.04	.05	.07	.08	.09	.11	.12	0.8	1.6	2.5	3.3	4.1
57	.005	4.01	1.02	8.02	5.02	2.03	9.03	6.04	3.05	20.3	40.6	60.9	81.2	101.5
58	6.996	3.99	0.99	7.98	4.98	1.98	8.97	5.97	2.97	19.8	39.5	59.3	79.1	098.8
59	.987	.97	.96	.95	.94	.92	.91	.90	.89	9.2	8.5	7.7	6.9	6.2
76 60	6.978	13.96	20.94	27.91	34.89	41.87	48.85	55.83	62.81	418.7	837.4	1256.1	1674.8	2093.5

Lat.		Latitude 76° to 77°—Meridional arcs.						Latitude 76°—Co-ordinates of curvature		
		Value of 1″	Sums of seconds for middle latitude 76° 30′		Value of 1′	Continuous sums of minutes from latitude 76° 00′		Longitude.	X	Y
°	′	Meters.	″	Meters.	Meters.	′	Meters.	° ′	Meters.	Meters.
76	00	31.009			1860.54					
	1	9	1	31.01	.55	1	1 860.5	0 1	450.3	0.1
	2	9	2	62.02	.55	2	3 721.1	2	900.6	0.3
	3	9	3	93.03	.55	3	5 581.6	3	1 350.8	0.6
	4	9	4	124.04	.55	4	7 442.2	4	1 801.1	1.0
76	05	31.009	5	155.05	1860.56	5	9 302.7	0 5	2 251.4	1.6
	6	9	6	186.06	.56	6	11 163.3	6	2 701.7	2.3
	7	9	7	217.07	.56	7	13 023.9	7	3 152.0	3.1
	8	9	8	248.08	.56	8	14 884.4	8	3 602.3	4.1
	9	9	9	279.09	.57	9	16 745.0	9	4 052.6	5.1
76	10	31.009	10	310.10	1860.57	10	18 605.6	0 10	4 502.8	6.4
	11	10	1	341.11	.57	1	20 466.1	15	6 754.3	14.3
	12	10	2	372.12	.57	2	22 326.7	20	9 005.7	25.4
	13	0	3	403.13	.58	3	24 187.3	25	11 257.1	39.7
	14	0	4	434.14	.58	4	26 047.8	30	13 508.4	57.2
76	15	31.010	15	465.15	1860.58	15	27 908.4	0 35	15 759.7	77.8
	16	0	6	496.17	.58	6	29 769.0	40	18 011.0	101.7
	17	0	7	527.18	.59	7	31 629.6	45	20 262.3	128.7
	18	0	8	558.19	.59	8	33 490.2	50	22 513.5	158.9
	19	0	9	589.20	.59	9	35 350.8	55	24 764.7	192.2
76	20	31.010	20	620.21	1860.59	20	37 211.4	1 00	27 015.8	228.8
	21	0	1	651.22	.60	1	39 072.0	05	29 266.9	268.5
	22	0	2	682.23	.60	2	40 932.6	10	31 517.9	311.4
	23	0	3	713.24	.60	3	42 793.2	15	33 768.9	357.4
	24	0	4	744.25	.60	4	44 653.8	20	36 019.8	406.7
76	25	31.010	25	775.26	1860.61	25	46 514.4	1 25	38 270.6	459.1
	26	0	6	806.27	.61	6	48 375.0	30	40 521.3	514.7
	27	0	7	837.28	.61	7	50 235.6	35	42 772.0	573.5
	28	0	8	868.29	.61	8	52 096.2	40	45 022.6	635.4
	29	0	9	899.30	.62	9	53 956.8	45	47 273.1	700.5
76	30	31.010	30	930.31	1860.62	30	55 817.4	1 50	49 523.5	768.8
	31	0	1	961.32	.62	1	57 678.1	55	51 773.8	840.3
	32	0	2	992.33	.62	2	59 538.7	2 00	54 024	915
	33	0	3	1 023.34	.63	3	61 399.3	3 00	81 017	2 058
	34	0	4	1 054.35	.63	4	63 259.9	4 00	107 986	3 659
76	35	31.011	35	1 085.36	1860.63	35	65 120.6	5 00	134 924	5 716
	36	1	6	1 116.37	.63	6	66 981.2	6 00	161 824	8 228
	37	1	7	1 147.38	.64	7	68 841.8	7 00	188 677	11 196
	38	1	8	1 178.39	.64	8	70 702.5	8 00	215 477	14 619
	39	1	9	1 209.40	.64	9	72 563.1	9 00	242 214	18 494
76	40	31.011	40	1 240.41	1860.64	40	74 423.8	10 00	268 882	22 822
	41	1	1	1 271.42	.65	1	76 284.4	11 00	295 473	27 601
	42	1	2	1 302.43	.65	2	78 145.1	12 00	321 979	32 829
	43	1	3	1 333.44	.65	3	80 005.7	13 00	348 393	38 505
	44	1	4	1 364.45	.65	4	81 866.4	14 00	374 706	44 628
76	45	31.011	45	1 395.46	1860.66	45	83 727.0	15 00	400 913	51 196
	46	1	6	1 426.47	.66	6	85 587.7	16 00	427 004	58 207
	47	1	7	1 457.49	.66	7	87 448.3	17 00	452 973	65 658
	48	1	8	1 488.50	.66	8	89 309.0	18 00	478 812	73 547
	49	1	9	1 519.51	.67	9	91 169.7	19 00	504 514	81 874
76	50	31.011	50	1 550.52	1860.67	50	93 030.3	20 00	530 071	90 635
	51	1	1	1 581.53	.67	1	94 891.0	21 00	555 476	99 827
	52	1	2	1 612.54	.67	2	96 751.7	22 00	580 722	109 448
	53	1	3	1 643.55	.68	3	98 612.3	23 00	605 801	119 495
	54	1	4	1 674.56	.68	4	100 473.0	24 00	630 706	129 965
76	55	31.011	55	1 705.57	1860.68	55	102 333.7	25 00	655 431	140 856
	56	1	6	1 736.58	.68	6	104 194.4	26 00	679 967	152 163
	57	1	7	1 767.59	.69	7	106 055.1	27 00	704 309	163 885
	58	1	8	1 798.60	.69	8	107 915.8	28 00	728 449	176 017
	59	2	9	1 829.61	.69	9	109 776.5	29 00	752 379	188 556
76	60	31.012	60	1 860.62	1860.69	60	111 637.1	30 00	776 094	201 498

Latitude 77° to 78°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
77 00	6.978	13.96	20.94	27.91	34.89	41.87	48.85	55.83	62.81	418.7	837.4	1256.1	1674.8	2093.5
1	.970	.94	.91	.88	.85	.82	.79	.76	.73	8.2	6.4	4.5	2.7	90.9
2	.961	.92	.86	.84	.80	.77	.73	.69	.65	7.7	5.3	3.0	70.6	88.3
3	.952	.90	.88	.81	.76	.71	.66	.62	.57	7.1	4.3	51.4	68.5	5.6
4	.943	.89	.83	.77	.72	.66	.60	.55	.49	6.6	3.2	49.8	6.4	3.0
77 05	6.935	13.87	20.80	27.74	34.67	41.61	48.54	55.48	62.41	416.1	832.1	1248.2	1664.3	2080.4
6	.926	.85	.78	.70	.63	.55	.48	.40	.33	5.5	1.1	6.6	2.2	77.7
7	.917	.83	.75	.67	.58	.50	.42	.34	.25	5.0	30.0	5.0	60.1	5.1
8	.908	.82	.72	.63	.54	.45	.36	.26	.17	4.5	29.0	3.5	58.0	72.4
9	.899	.80	.70	.60	.50	.40	.29	.19	.09	4.0	7.9	1.9	5.8	69.8
77 10	6.891	13.78	20.67	27.56	34.45	41.34	48.23	55.12	62.01	413.4	826.9	1240.3	1653.7	2067.2
11	.882	.76	.64	.53	.41	.29	.17	5.05	1.94	2.9	5.8	38.7	51.6	4.5
12	.873	.75	.62	.49	.36	.24	.11	4.98	.86	2.4	4.8	7.1	49.5	61.9
13	.864	.73	.59	.46	.32	.18	8.05	.91	.78	1.8	3.7	5.5	7.4	59.2
14	.855	.71	.57	.42	.28	.13	7.99	.84	.70	1.3	2.6	4.0	5.3	6.6
77 15	6.847	13.69	20.54	27.39	34.23	41.08	47.93	54.77	61.62	410.8	821.6	1232.4	1643.2	2054.0
16	.838	.68	.51	.35	.19	1.03	.86	.70	.54	10.3	20.5	30.8	41.1	51.3
17	.829	.66	.49	.32	.14	0.97	.80	.63	.46	09.7	19.5	29.2	38.9	48.7
18	.820	.64	.46	.28	.10	.92	.74	.56	.38	9.2	8.4	7.6	6.8	6.0
19	.811	.62	.43	.25	.06	.87	.68	.49	.30	8.7	7.4	6.0	4.7	3.4
77 20	6.803	13.61	20.41	27.21	34.01	40.82	47.62	54.42	61.22	408.2	816.3	1224.5	1632.6	2040.8
21	.794	.59	.38	.17	3.97	.76	.56	.35	.14	7.6	5.2	2.9	30.5	38.1
22	.785	.57	.36	.14	.92	.71	.50	.28	1.06	7.1	4.2	21.3	28.4	5.5
23	.776	.55	.33	.10	.88	.66	.43	.21	0.98	6.6	3.1	19.7	6.3	2.8
24	.767	.53	.30	.07	.84	.60	.37	.14	.91	6.0	2.1	8.1	4.2	30.2
77 25	6.759	13.52	20.28	27.03	33.79	40.55	47.31	54.07	60.83	405.5	811.0	1216.5	1622.1	2027.6
26	.750	.50	.25	7.00	.75	.50	.25	4.00	.75	5.0	10.0	5.0	19.9	4.9
27	.741	.48	.22	6.96	.70	.45	.19	3.93	.67	4.5	08.9	3.4	7.8	22.3
28	.732	.46	.20	.95	.66	.39	.12	.86	.59	3.9	7.9	1.8	5.7	19.6
29	.723	.45	.17	.89	.62	.34	.06	.79	.51	3.4	6.8	10.2	3.6	7.0
77 30	6.715	13.43	20.14	26.86	33.57	40.29	47.00	53.72	60.43	402.9	805.7	1208.6	1611.5	2014.4
31	.706	.41	.12	.82	.53	.23	6.94	.65	.35	2.3	4.7	7.0	09.4	11.7
32	.697	.39	.09	.79	.48	.18	.88	.58	.27	1.8	3.6	5.4	7.3	09.1
33	.688	.38	.06	.75	.44	.13	.82	.50	.19	1.3	2.6	3.9	5.1	6.4
34	.679	.36	.04	.72	.40	.08	.75	.43	.11	0.8	1.5	2.3	3.0	3.8
77 35	6.670	13.34	20.01	26.68	33.35	40.02	46.69	53.36	60.03	400.2	800.5	1200.7	1600.9	2001.1
36	.662	.32	19.98	.65	.31	39.97	.63	.29	59.96	399.7	799.4	199.1	598.8	1998.5
37	.653	.31	.96	.61	.26	.92	.57	.22	.88	9.2	8.3	7.5	6.7	5.9
38	.644	.29	.93	.58	.22	.86	.51	.15	.80	8.6	7.3	5.9	4.6	3.2
39	.635	.27	.91	.54	.18	.81	.45	.08	.72	8.1	6.2	4.3	2.5	90.6
77 40	6.626	13.25	19.88	26.51	33.13	39.76	46.38	53.01	59.64	397.6	795.2	1192.8	1590.3	1987.9
41	.618	.24	.85	.47	.09	.71	.32	2.94	.56	7.1	4.1	91.2	88.2	5.3
42	.609	.22	.83	.43	.04	.65	.26	.87	.48	6.5	3.0	89.6	6.1	2.6
43	.600	.20	.80	.40	3.00	.60	.20	.80	.40	6.0	2.0	8.0	4.0	80.0
44	.591	.18	.77	.36	2.95	.55	.14	.73	.32	5.5	90.9	6.4	81.9	77.3
77 45	6.582	13.16	19.75	26.33	32.91	39.49	46.07	52.66	59.24	394.9	789.9	1184.8	1579.8	1974.7
46	.574	.15	.72	.29	.87	.44	6.01	.59	.16	4.4	8.8	3.2	7.6	72.1
47	.565	.13	.69	.26	.82	.39	5.95	.52	.08	3.9	7.8	1.6	5.5	69.4
48	.556	.11	.66	.22	.78	.34	.89	.45	9.00	3.4	6.7	80.1	3.4	6.8
49	.547	.09	.64	.19	.73	.28	.83	.38	8.92	2.8	5.6	78.5	71.3	4.1
77 50	6.538	13.08	19.61	26.15	32.69	39.23	45.77	52.31	58.84	392.3	784.6	1176.9	1569.2	1961.5
51	.529	.06	.59	.12	.65	.18	.71	.24	.76	1.8	3.5	5.3	7.1	58.8
52	.521	.04	.56	.08	.60	.12	.64	.17	.68	1.2	2.5	3.7	4.9	6.2
53	.512	.02	.53	.05	.56	.07	.58	.09	.60	0.7	1.4	2.1	2.8	3.5
54	.503	3.01	.51	6.01	.51	9.02	.52	2.02	.53	90.2	80.4	70.5	60.7	50.9
77 55	6.494	12.99	19.48	25.98	32.47	38.96	45.46	51.95	58.45	389.6	779.3	1168.9	1558.6	1948.2
56	.485	.97	.46	.94	.43	.91	.40	.88	.37	9.1	8.2	7.4	6.5	5.6
57	.477	.95	.43	.91	.38	.86	.34	.81	.29	8.6	7.2	5.8	4.4	3.0
58	.468	.94	.40	.87	.34	.81	.27	.74	.21	8.1	6.1	4.2	2.2	40.3
59	.459	.92	.38	.84	.29	.75	.21	.67	.13	7.5	5.1	2.6	50.1	37.7
77 60	6.450	12.90	19.35	25.80	32.25	38.70	45.15	51.60	58.05	387.0	774.0	1161.0	1548.0	1935.0

Lat.		Latitude 77° to 78°—Meridional arcs.						Latitude 77°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 77° 30′		Value of 1′	Continuous sums of minutes from latitude 77° 00′		Longitude.	X	Y
°	′	*Meters.*	″	*Meters.*	*Meters.*	′	*Meters.*	° ′	*Meters.*	*Meters.*
77	00	31.012			1860.69					
	1	2	1	31.01	.70	1	1 860.7	0 1	418.7	0.1
	2	2	2	62.03	.70	2	3 721.4	2	837.4	0.2
	3	2	3	93.04	.70	3	5 582.1	3	1 256.1	0.5
	4	2	4	124.05	.70	4	7 442.8	4	1 674.8	0.9
77	05	31.012	5	155.06	1860.71	5	9 303.5	0 5	2 093.5	1.5
	6	2	6	186.08	.71	6	11 164.2	6	2 512.3	2.1
	7	2	7	217.09	.71	7	13 024.9	7	2 931.0	2.9
	8	2	8	248.10	.71	8	14 885.6	8	3 349.7	3.8
	9	2	9	279.11	.71	9	16 746.3	9	3 768.4	4.8
77	10	31.012	10	310.13	1860.72	10	18 607.1	0 10	4 187.1	5.9
	11	2	1	341.14	.72	1	20 467.8	15	6 280.6	13.4
	12	2	2	372.15	.72	2	22 328.5	20	8 374.1	23.7
	13	2	3	403.17	.72	3	24 189.2	25	10 467.6	37.1
	14	2	4	434.18	.73	4	26 049.9	30	12 561.1	53.4
77	15	31.012	15	465.19	1860.73	15	27 910.7	0 35	14 654.6	72.7
	16	2	6	496.20	.73	6	29 771.4	40	16 748.0	94.9
	17	2	7	527.22	.73	7	31 632.1	45	18 841.4	120.2
	18	2	8	558.23	.74	8	33 492.9	50	20 934.8	148.3
	19	2	9	589.24	.74	9	35 353.6	55	23 028.1	179.5
77	20	31.012	20	620.25	1860.74	20	37 214.3	1 00	25 121.4	213.6
	21	2	1	651.27	.74	1	39 075.1	05	27 214.6	250.7
	22	2	2	682.28	.75	2	40 935.8	10	29 307.7	290.7
	23	2	3	713.29	.75	3	42 796.6	15	31 400.8	333.8
	24	3	4	744.31	.75	4	44 657.3	20	33 493.9	379 7
77	25	31.013	25	775.32	1860.75	25	46 518.1	1 25	35 586.9	428.7
	26	3	6	806.33	.76	6	48 378.8	30	37 679.8	480.6
	27	3	7	837.34	.76	7	50 239.6	35	39 772.6	535.5
	28	3	8	868.36	.76	8	52 100.3	40	41 865.3	593.3
	29	3	9	899.37	.76	9	53 961.1	45	43 958.0	654.1
77	30	31.013	30	930.38	1860.76	30	55 821.9	1 50	46 050.6	717.9
	31	3	1	961.40	.77	1	57 682.6	55	48 143.0	784.7
	32	3	2	992.41	.77	2	59 543.4	2 00	50 235	854
	33	3	3	1 023.42	.77	3	61 404.2	3 00	75 335	1 922
	34	3	4	1 054.43	.77	4	63 265.0	4 00	100 413	3 417
77	35	31.013	35	1 085.45	1860.78	35	65 125.7	5 00	125 462	5 337
	36	3	6	1 116.46	.78	6	66 986.5	6 00	150 474	7 684
	37	3	7	1 147.47	.78	7	68 847.3	7 00	175 443	10 455
	38	3	8	1 178.48	.78	8	70 708.1	8 00	200 361	13 650
	39	3	9	1 209.50	.79	9	72 568.9	9 00	225 221	17 269
77	40	31.013	40	1 240.51	1860.79	40	74 429.6	10 00	250 016	21 310
	41	3	1	1 271.52	.79	1	76 290.4	11 00	274 739	25 772
	42	3	2	1 302.54	.79	2	78 151.2	12 00	299 383	30 654
	43	3	3	1 333.55	.79	3	80 012.0	13 00	323 939	35 954
	44	3	4	1 364.56	.80	4	81 872.8	14 00	348 403	41 671
77	45	31.013	45	1 395.57	1860.80	45	83 733.6	15 00	372 765	47 804
	46	3	6	1 426.59	.80	6	85 594.4	16 00	397 019	54 349
	47	3	7	1 457.60	.80	7	87 455.2	17 00	421 159	61 306
	48	3	8	1 488.61	.81	8	89 316.0	18 00	445 177	68 673
	49	3	9	1 519.62	.81	9	91 176.8	19 00	469 066	76 447
77	50	31.014	50	1 550.64	1860.81	50	93 037.6	20 00	492 820	84 626
	51	4	1	1 581.65	.81	1	94 898.5	21 00	516 431	93 208
	52	4	2	1 612.66	.82	2	96 759.3	22 00	539 892	102 190
	53	4	3	1 643.68	.82	3	98 620.1	23 00	563 198	111 570
	54	4	4	1 674.69	.82	4	100 480.9	24 00	586 341	121 345
77	55	31.014	55	1 705.70	1860.82	55	102 341.7	25 00	609 314	131 512
	56	4	6	1 736.71	.82	6	104 202.5	26 00	632 111	142 068
	57	4	7	1 767.73	.83	7	106 063.4	27 00	654 725	153 010
	58	4	8	1 798.74	.83	8	107 924.2	28 00	677 149	164 335
	59	4	9	1 829.75	.83	9	109 785.0	29 00	699 378	176 040
77	60	31.014	60	1 860.76	1860.83	60	111 645.9	30 00	721 405	188 121

Latitude 78° to 79°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
78 00	6.450	12.90	19.35	25.80	32.25	38.70	45.15	51.60	58.05	387.0	774.0	1161.0	1548.0	1935.0
1	.441	.88	.32	.77	.21	.65	.09	.53	7.97	6.5	2.9	59.4	5.9	32.4
2	.432	.86	.30	.73	.16	.59	5.03	.46	.89	5.9	1.9	7.8	3.8	29.7
3	.424	.85	.27	.69	.12	.54	4.96	.39	.81	5.4	70.8	6.2	41.7	7.1
4	.415	.83	.24	.66	.07	.49	.90	.32	.73	4.9	69.8	4.7	39.5	4.4
78 05	6.406	12.81	19.22	25.62	32.03	38.44	44.84	51.24	57.65	384.4	768.7	1153.1	1537.4	1921.8
6	.397	.79	.19	.59	1.99	.38	.78	.18	.57	3.8	7.6	51.5	5.3	19.1
7	.388	.78	.17	.55	.94	.33	.72	.11	.50	3.3	6.6	49.9	3.2	6.5
8	.379	.76	.14	.52	.90	.28	.65	1.03	.42	2.8	5.5	8.3	31.1	3.8
9	.371	.74	.11	.48	.85	.22	.59	0.96	.34	2.2	4.5	6.7	28.9	11.2
78 10	6.362	12.72	19.09	25.45	31.81	38.17	44.53	50.89	57.26	381.7	763.4	1145.1	1526.8	1908.5
11	.353	.71	.06	.41	.77	.12	.47	.82	.18	1.2	2.4	3.5	4.7	5.9
12	.344	.69	.03	.38	.72	.06	.41	.75	.10	0.6	1.3	1.9	2.6	3.2
13	.335	.67	9.01	.34	.68	8.01	.34	.68	7.02	80.1	60.2	40.4	20.5	900.6
14	.326	.65	8.98	.31	.63	7.96	.28	.61	6.94	79.6	59.2	38.8	18.3	897.9
78 15	6.318	12.64	18.95	25.27	31.59	37.91	44.22	50.54	56.86	379.1	758.1	1137.2	1516.2	1895.3
16	.309	.62	.93	.23	.54	.85	.16	.47	.78	8.5	7.1	5.6	4.1	2.6
17	.300	.60	.90	.20	.50	.80	.10	.40	.70	8.0	6.0	4.0	12.0	90.0
18	.291	.58	.87	.16	.46	.75	4.04	.33	.62	7.5	4.9	2.4	09.9	87.3
19	.282	.56	.85	.13	.41	.69	3.97	.26	.54	6.9	3.9	30.8	7.7	4.7
78 20	6.273	12.55	18.82	25.09	31.37	37.64	43.91	50.19	56.46	376.4	752.8	1129.2	1505.6	1882.0
21	.265	.53	.79	.06	.32	.59	.85	.12	.38	5.9	1.8	7.6	3.5	79.4
22	.256	.51	.77	5.02	.28	.53	.79	50.05	.30	5.3	50.7	6.0	501.4	6.7
23	.247	.49	.74	4.99	.24	.48	.73	49.98	.22	4.8	49.6	4.4	499.3	4.1
24	.238	.48	.71	.95	.19	.43	.67	.90	.14	4.3	8.6	2.9	7.1	71.4
78 25	6.229	12.46	18.69	24.92	31.15	37.38	43.60	49.83	56.06	373.8	747.5	1121.3	1495.0	1868.8
26	.220	.44	.66	.88	.10	.32	.54	.76	5.98	3.2	6.5	19.7	2.9	6.1
27	.212	.42	.64	.85	.06	.27	.48	.69	.91	2.7	5.4	8.1	90.8	3.5
28	.203	.41	.61	.81	1.01	.22	.42	.62	.83	2.2	4.3	6.5	88.7	60.8
29	.194	.39	.58	.78	0.97	.16	.36	.55	.75	1.6	3.3	4.9	6.5	58.2
78 30	6.185	12.37	18.56	24.74	30.93	37.11	43.30	49.48	55.67	371.1	742.2	1113.3	1484.4	1855.5
31	.176	.35	.53	.71	.88	.06	.23	.41	.59	0.6	1.1	1.7	2.3	2.9
32	.167	.33	50	.67	.84	7.00	.17	.34	.51	70.0	40.1	10.1	80.2	50.2
33	.159	.32	.48	.63	.79	6.95	.11	.27	.43	69.5	39.0	08.5	78.0	47.6
34	.150	.30	.45	.60	.75	.90	3.05	.20	.35	9.0	8.0	6.9	5.9	4.9
78 35	6.141	12.28	18.42	24.56	30.71	36.85	42.99	49.13	55.27	368.5	736.9	1105.4	1473.8	1842.3
36	.132	.26	.40	.53	.66	.79	.93	9.06	.19	7.9	5.8	3.8	71.7	39.6
37	.123	.25	.37	.49	.62	.74	.86	8.98	.11	7.4	4.8	2.2	69.6	6.9
38	.114	.23	.34	.46	.57	.69	.80	.91	5.03	6.9	3.7	100.6	7.4	4.3
39	.105	.21	.32	.42	.53	.63	.74	.84	4.95	6.3	2.7	099.0	5.3	31.6
78 40	6.097	12.19	18.29	24.39	30.48	36.58	42.68	48.77	54.87	365.8	731.6	1097.4	1463.2	1829.0
41	.088	.17	.26	.35	.44	.53	.62	.70	.79	5.3	30.5	5.8	61.1	6.3
42	.079	.16	.24	.32	.39	.47	.56	.63	.71	4.7	29.5	4.2	58.9	3.7
43	.070	.14	.21	.28	.35	.42	.49	.56	.63	4.2	8.4	2.6	6.8	21.0
44	.061	.12	.18	.25	.31	.37	.43	.49	.55	3.7	7.3	91.0	4.7	18.4
78 45	6.052	12.10	18.16	24.21	30.26	36.31	42.37	48.42	54.47	363.1	726.3	1089.4	1452.6	1815.7
46	.044	.09	.13	.17	.22	.26	.31	.35	.39	2.6	5.2	7.8	50.4	3.1
47	.035	.07	.10	.14	.17	.21	.24	.28	.31	2.1	4.2	6.2	48.3	10.4
48	.026	.05	.08	.10	.13	.16	.18	.21	.23	1.6	3.1	4.7	6.2	07.8
49	.017	.03	.05	.07	.08	.10	.12	.14	.15	1.0	2.0	3.1	4.1	5.1
78 50	6.008	12.02	18.02	24.03	30.04	36.05	42.06	48.06	54.07	360.5	721.0	1081.5	1442.0	1802.4
51	5.999	2.00	8.00	4.00	30.00	6.00	2.00	7.99	3.99	60.0	19.9	79.9	39.8	799.8
52	.990	1.98	7.97	3.96	29.95	5.94	1.93	.92	.91	59.4	8.9	8.3	7.7	7.1
53	.982	.96	.94	.93	.91	.89	.87	.85	.83	8.9	7.8	6.7	5.6	4.5
54	.973	.95	.92	.89	.86	.84	.81	.78	75	8.4	6.7	5.1	3.5	91.8
78 55	5.964	11.93	17.89	23.86	29.82	35.78	41.75	47.71	53.68	357.8	715.7	1073.5	1431.3	1789.2
56	.955	.91	.86	.82	.78	.73	.69	.64	.60	7.3	4.6	1.9	29.2	6.5
57	.946	.89	.84	.78	.73	.68	.62	.57	.52	6.8	3.5	70.3	7.1	3.9
58	.937	.87	.81	.75	.69	.62	.56	.50	.44	6.2	2.5	68.7	5.0	81.2
59	.928	.86	.79	.71	.64	.57	.50	.43	.36	5.7	1.4	7.1	2.8	78.5
78 60	5.920	11.84	17.76	23.68	29.60	35.52	41.44	47.36	53.28	355.2	710.4	1065.5	1420.7	1775.9

Lat.		Latitude 78° to 79°—Meridional arcs.						Latitude 78°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 78° 30′		Value of 1′	Continuous sums of minutes from latitude 78° 00′		Longitude.	X	Y
°	′	Meters.	″	Meters.	Meters.	′	Meters.	° ′	Meters.	Meters.
78	00	31.014			1860.83					
	1	4	1	31.01	.84	1	1 860.8	0 1	387.0	0.1
	2	4	2	62.03	.84	2	3 721.7	2	774.0	0.2
	3	4	3	93.04	.84	3	5 582.5	3	1 161.0	0.5
	4	4	4	124.06	.84	4	7 443.4	4	1 548.0	0.9
78	05	31.014	5	155.07	1860.84	5	9 304.2	0 5	1 935.0	1.4
	6	4	6	186.09	.85	6	11 165.0	6	2 322.0	2.0
	7	4	7	217.10	.85	7	13 025.9	7	2 709.0	2.7
	8	4	8	248.12	.85	8	14 886.7	8	3 096.0	3.5
	9	4	9	279.13	.85	9	16 747.6	9	3 483.0	4.5
78	10	31.014	10	310.15	1860.86	10	18 608.4	0 10	3 870.0	5.5
	11	4	1	341.16	.86	1	20 469.3	15	5 805.0	12.4
	12	4	2	372.18	.86	2	22 330.2	20	7 740.0	22.0
	13	4	3	403.19	.86	3	24 191.0	25	9 675.0	34.4
	14	4	4	434.21	.86	4	26 051.9	30	11 610.0	49.6
78	15	31.014	15	465.22	1860.87	15	27 912.8	0 35	13 544.9	67.4
	16	4	6	496.24	.87	6	29 773.6	40	15 479.8	88.1
	17	5	7	527.25	.87	7	31 634.5	45	17 414.7	111.5
	18	5	8	558.27	.87	8	33 495.4	50	19 349.5	137.6
	19	5	9	589.28	.88	9	35 356.2	55	21 284.3	166.5
78	20	31.015	20	620.30	1860.88	20	37 217.1	1 00	23 219.1	198.2
	21	5	1	651.31	.88	1	39 078.0	05	25 153.8	232.6
	22	5	2	682.33	.88	2	40 938.9	10	27 088.4	269.8
	23	5	3	713.34	.88	3	42 799.8	15	29 023.0	309.7
	24	5	4	744.36	.89	4	44 660.6	20	30 957.6	352.4
78	25	31.015	25	775.37	1860.89	25	46 521.5	1 25	32 892.1	397.8
	26	5	6	806.39	.89	6	48 382.4	30	34 826.5	445.9
	27	5	7	837.40	.89	7	50 243.3	35	36 760.8	496.9
	28	5	8	868.42	.90	8	52 104.2	40	38 695.1	550.5
	29	5	9	899.43	.90	9	53 965.1	45	40 629.3	606.9
78	30	31.015	30	930.45	1860.90	30	55 826.0	1 50	42 563.4	666,1
	31	5	1	961.46	.90	1	57 686.9	55	44 497.4	728.1
	32	5	2	992.48	.90	2	59 547.8	2 00	46 431	793
	33	5	3	1 023.49	.91	3	61 408.7	3 00	69 630	1 784
	34	5	4	1 054.51	.91	4	63 269.6	4 00	92 809	3 170
78	35	31.015	35	1 085.52	1860.91	35	65 130.5	5 00	115 960	4 952
	36	5	6	1 116.54	.91	6	66 991.4	6 00	139 078	7 129
	37	5	7	1 147.55	.91	7	68 852.4	7 00	162 155	9 701
	38	5	8	1 178.57	.92	8	70 713.3	8 00	185 185	12 665
	39	5	9	1 209.58	.92	9	72 574.2	9 00	208 160	16 023
78	40	31.015	40	1 240.60	1860.92	40	74 435.1	10 00	231 076	19 773
	41	5	1	1 271.61	.92	1	76 296.0	11 00	253 923	23 913
	42	5	2	1 302.63	.93	2	78 157.0	12 00	276 697	28 442
	43	5	3	1 333.64	.93	3	80 017.9	13 00	299 390	33 360
	44	5	4	1 364.66	.93	4	81 878.8	14 00	321 996	38 664
78	45	31.016	45	1 395.67	1860.93	45	83 739.7	15 00	344 509	44 353
	46	6	6	1 426.69	.93	6	85 600.7	16 00	366 920	50 426
	47	6	7	1 457.70	.94	7	87 461.6	17 00	389 225	56 881
	48	6	8	1 488.72	.94	8	89 322.6	18 00	411 416	63 715
	49	6	9	1 519.73	.94	9	91 183.5	19 00	433 488	70 927
78	50	31.016	50	1 550.75	1860.94	50	93 044.4	20 00	455 433	78 515
	51	6	1	1 581.76	.94	1	94 905.4	21 00	477 245	86 477
	52	6	2	1 612.78	.95	2	96 766.3	22 00	498 918	94 809
	53	6	3	1 643.79	.95	3	98 627.2	23 00	520 446	103 511
	54	6	4	1 674.81	.95	4	100 488.2	24 00	541 822	112 579
78	55	31.016	55	1 705.82	1860.95	55	102 349.1	25 00	563 041	122 010
	56	6	6	1 736.84	.95	6	104 210.1	26 00	584 095	131 802
	57	6	7	1 767.85	.96	7	106 071.1	27 00	604 979	141 952
	58	6	8	1 798.87	.96	8	107 932.0	28 00	625 686	152 457
	59	6	9	1 829.88	.96	9	109 793.0	29 00	646 212	163 314
78	60	31.016	60	1 860.90	1860.96	60	111 653.9	30 00	666 549	174 520

Latitude 79° to 80°—Arcs of the parallel in meters

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
79 00	5.920	11.84	17.76	23.68	29.60	35.52	41.44	47.36	53.28	355.2	710.4	1065.5	1420.7	1775.9
1	.911	.82	.73	.64	.55	.46	.38	.29	.20	4.6	9.3	3.9	18.6	3.2
2	.902	.80	.71	.61	.51	.41	.31	.22	.12	4.1	8.2	2.3	6.5	70.6
3	.893	.79	.68	.57	.47	.36	.25	.14	3.04	3.6	7.2	60.7	4.3	67.9
4	.884	.77	.65	.54	.42	.31	.19	.07	2.96	3.1	6.1	59.2	2.2	5.3
79 05	5.875	11.75	17.63	23.50	29.38	35.25	41.13	47.00	52.88	352.5	705.0	1057.6	1410.1	1762.6
6	.866	.73	.60	.47	.33	.20	.06	6.93	.80	2.0	4.0	6.0	08.0	59.9
7	.858	.72	.57	.43	.29	.15	1.00	.86	.72	1.5	2.9	4.4	5.8	7.3
8	.849	.70	.55	.39	.24	.09	0.94	.79	.64	0.9	1.8	2.8	3.7	4.6
9	.840	.68	.52	.36	.20	5.04	.88	.72	.56	50.4	700.8	51.2	401.6	52.0
79 10	5.831	11.66	17.49	23.32	29.16	34.99	40.82	46.65	52.48	349.9	699.7	1049.6	1399.4	1749.3
11	.822	.64	.47	.29	.11	.93	.76	.58	.40	9.3	8.7	8.0	7.3	6.7
12	.813	.63	.44	.25	.07	.88	.69	.51	.32	8.8	7.6	6.4	5.2	4.0
13	.804	.61	.41	.22	9.02	.83	.63	.43	.24	8.3	6.5	4.8	3.1	41.3
14	.796	.59	.39	.18	8.98	.77	.57	.36	.16	7.7	5.5	3.2	90.9	38.7
79 15	5.787	11.57	17.36	23.15	28.93	34.72	40.51	46.29	52.08	347.2	694.4	1041.6	1388.8	1736.0
16	.778	.56	.33	.11	.89	.67	.45	.22	2.00	6.7	3.3	40.0	6.7	3.4
17	.769	.54	.31	.08	.85	.61	.38	.15	1.92	6.1	2.3	38.4	4.6	30.7
18	.760	.52	.28	.04	.80	.56	.32	.08	.84	5.6	1.2	6.8	2.4	28.0
19	.751	.50	.25	3.01	.76	.51	.26	6.01	.76	5.1	90.2	5.2	80.3	5.4
79 20	5.742	11.48	17.23	22.97	28.71	34.45	40.20	45.94	51.68	344.5	689.1	1033.6	1378.2	1722.7
21	.734	.47	.20	.93	.67	.40	.14	.87	.60	4.0	8.0	2.0	6.0	20.1
22	.725	.45	.17	.90	.62	.35	.07	.80	.52	3.5	7.0	30.4	3.9	17.4
23	.716	.43	.15	.86	.58	.29	40.01	.73	.44	2.9	5.9	28.8	71.8	4.7
24	.707	.41	.12	.83	.53	.24	39.95	.66	.36	2.4	4.8	7.2	69.7	12.1
79 25	5.698	11.40	17.09	22.79	28.49	34.19	39.89	45.58	51.28	341.9	683.8	1025.6	1367.5	1709.4
26	.689	.38	.07	.76	.45	.14	.83	.51	.20	1.4	2.7	4.1	5.4	6.8
27	.680	.36	.04	.72	.40	.08	.76	.44	.12	0.8	1.6	2.5	3.3	4.1
28	.671	.34	7.01	.69	.36	4.03	.70	.37	1.04	40.3	80.6	20.9	61.1	701.4
29	.663	.33	6.99	.65	.31	3.98	.64	.30	0.96	39.8	79.5	19.3	59.0	698 8
79 30	5.654	11.31	16.96	22.61	28.27	33.92	39.58	45.23	50.88	339.2	678.4	1017.7	1356.9	1696.1
31	.645	.29	.93	.58	.22	.87	.51	.16	.80	8.7	7.4	6.1	4.8	3.4
32	.636	.27	.91	.54	.18	.82	.45	.09	.72	8.2	6.3	4.5	2.6	90.8
33	.627	.25	.88	.51	.14	.76	.39	5.02	.64	7.6	5.2	2.9	50.5	88.1
34	.618	.24	.85	.47	.09	.71	.33	4.94	.56	7.1	4.2	11.3	48.4	5.4
79 35	5.609	11.22	16.83	22.44	28.05	33.66	39.27	44.87	50.48	336.6	673.1	1009.7	1346.2	1682.8
36	.600	.20	.80	.40	8.00	.60	.20	.80	.40	6.0	2.1	8.1	4.1	80.1
37	.592	.18	.78	.37	7.96	.55	.14	.73	.33	5.5	71.0	6.5	42.0	77.5
38	.583	.17	.75	.33	.91	.50	.08	.66	.24	5.0	69.9	4.9	39.9	4.8
39	.574	.15	.72	.30	.87	.44	9.02	.59	.17	4.4	8.9	3.3	7.7	72.2
79 40	5.565	11.13	16.70	22.26	27.83	33.39	38.96	44.52	50.09	333.9	667.8	1001.7	1335.6	1669.5
41	.556	.11	.67	.22	.78	.34	.89	.45	50.00	3.4	6.7	1000.1	3.5	6.8
42	.547	.09	.64	.19	.74	.28	.83	.38	49.93	2.8	5.7	998.5	31.3	4.2
43	.538	.08	.62	.15	.69	.23	.77	.31	.85	2.3	4.6	6.9	29.2	61.5
44	.529	.06	.59	.12	.65	.18	.71	.23	.76	1.8	3.5	5.3	7.1	58.8
79 45	5.521	11.04	16.56	22.08	27.60	33.12	38.64	44.16	49.69	331.2	662.5	993.7	1324.9	1656.2
46	.512	.02	.54	.04	.56	.07	.58	.09	.61	0.7	1.4	2.1	2.8	3.5
47	.503	1.00	.51	2.01	.51	3.02	.52	4.02	.52	30.2	60.3	90.5	20.7	50.8
48	.494	0.99	.48	1.98	.47	2.96	.46	3.95	.45	29.6	59.3	88.9	18.5	48.2
49	.485	.97	.46	.94	.43	.91	.39	.88	.37	9.1	8.2	7.3	6.4	5.5
79 50	5.476	10.95	16.43	21.91	27.38	32.86	38.33	43.81	49.29	328.6	657.2	985.7	1314.3	1642.9
51	.467	.93	.40	.87	.34	.80	.27	.74	.21	8.0	6.1	4.1	2.2	40.2
52	.458	.92	.38	.83	.29	.75	.21	.67	.13	7.5	5.0	2.5	10.0	37.5
53	.450	.90	.35	.80	.25	.70	.14	.60	9.05	7.0	3.9	80.9	07.9	4.9
54	.441	.88	.32	.76	.20	.64	.08	.53	8.97	6.4	2.9	79.3	5.8	32.2
79 55	5.432	10.86	16.30	21.73	27.16	32.59	38.02	43.45	48.89	325.9	651.8	977.4	1303.6	1629.5
56	.423	.85	.27	.69	.12	.54	7.96	.38	.81	5.4	50.7	6.1	301.5	6.9
57	.414	.83	.24	.66	.07	.48	.90	.31	.73	4.8	49.7	4.5	299.4	4.2
58	.405	.81	.21	.62	7.03	.43	.83	.24	.65	4.3	8.6	2.9	7.2	21.5
59	.396	.79	.19	.58	6.98	.38	.77	.17	.56	3.8	7.5	71.3	5.1	18.8
79 60	5.387	10.77	16.16	21.55	26.94	32.32	37.71	43.10	48.49	323.2	646.5	969.7	1293.0	1616.2

Lat.		Latitude 79° to 80°—Meridional arcs.						Latitude 79°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 79° 30′		Value of 1′	Continuous sums of minutes from latitude 79° 00′		Longitude.	X	Y
°	′	*Meters.*	″	*Meters.*	*Meters.*	′	*Meters.*	° ′	*Meters.*	*Meters.*
79	00	31.016			1860.96					
	1	6	1	31.02	.97	1	1 861.0	0 1	355.2	0.1
	2	6	2	62.03	.97	2	3 721.9	2	710.3	0.2
	3	6	3	93.05	.97	3	5 582.9	3	1 065.5	0.5
	4	6	4	124.07	.97	4	7 443.9	4	1 420.7	0.8
79	05	31.016	5	155.09	1860.97	5	9 304.8	0 5	1 775.9	1.3
	6	6	6	186.10	.98	6	11 165.8	6	2 131.1	1.8
	7	6	7	217.12	.98	7	13 026.8	7	2 486.2	2.5
	8	6	8	248.14	.98	8	14 887.8	8	2 841.4	3.2
	9	6	9	279.15	.98	9	16 748.8	9	3 196.6	4.1
79	10	31.016	10	310.17	1860.98	10	18 609.7	0 10	3 551.8	5.1
	11	6	1	341.19	.99	1	20 470.7	15	5 327.6	11.4
	12	6	2	372.20	.99	2	22 331.7	20	7 103.5	20.3
	13	6	3	403.22	.99	3	24 192.7	25	8 879.3	31.7
	14	7	4	434.24	.99	4	26 053.7	30	10 655.2	45.6
79	15	31.017	15	465.26	1860.99	15	27 914.7	0 35	12 431.0	62.1
	16	7	6	496.27	1.00	6	29 775.7	40	14 206.8	81.1
	17	7	7	527.29	.00	7	31 636.7	45	15 982.5	102.7
	18	7	8	558.31	.00	8	33 497.7	50	17 758.2	126.8
	19	7	9	589.32	.00	9	35 358.7	55	19 533.9	153.4
79	20	31.017	20	620.34	1861.00	20	37 219.7	1 00	21 309.6	182.5
	21	7	1	651.36	.01	1	39 080.7	05	23 085.2	214.2
	22	7	2	682.38	.01	2	40 941.7	10	24 860.7	248.5
	23	7	3	713.39	.01	3	42 802.7	15	26 636.2	285.2
	24	7	4	744.41	.01	4	44 663.7	20	28 411.7	324.5
79	25	31.017	25	775.43	1861.01	25	46 524.7	1 25	30 187.1	366.4
	26	7	6	806.44	.02	6	48 385.8	30	31 962.4	410.7
	27	7	7	837.46	.02	7	50 246.8	35	33 737.6	457.6
	28	7	8	868.48	.02	8	52 107.8	40	35 512.8	507.0
	29	7	9	899.49	.02	9	53 968.8	45	37 288.0	559.0
79	30	31.017	30	930.51	1861.02	30	55 829.8	1 50	39 063.0	613.5
	31	7	1	961.53	.03	1	57 690.9	55	40 838.0	670.6
	32	7	2	992.55	.03	2	59 551.9	2 00	42 613	730
	33	7	3	1 023.56	.03	3	61 412.9	3 00	63 904	1 643
	34	7	4	1 054.58	.03	4	63 274.0	4 00	85 176	2 920
79	35	31.017	35	1 085.60	1861.03	35	65 135.0	5 00	106 423	4 561
	36	7	6	1 116.61	.04	6	66 996.0	6 00	127 639	6 566
	37	7	7	1 147.63	.04	7	68 857.1	7 00	148 817	8 934
	38	7	8	1 178.65	.04	8	70 718.1	8 00	169 952	11 665
	39	7	9	1 209.67	.04	9	72 579.2	9 00	191 036	14 758
79	40	31.017	40	1 240.68	1861.04	40	74 440.2	10 00	212 065	18 211
	41	7	1	1 271.70	.05	1	76 301.2	11 00	233 031	22 024
	42	7	2	1 302.72	.05	2	78 162.3	12 00	253 929	26 195
	43	7	3	1 333.73	.05	3	80 023.3	13 00	274 753	30 724
	44	8	4	1 364.75	.05	4	81 884.4	14 00	295 496	35 609
79	45	31.018	45	1 395.77	1861.05	45	83 745.4	15 00	316 152	40 849
	46	8	6	1 426.79	.06	6	85 606.5	16 00	336 715	46 442
	47	8	7	1 457.80	.06	7	87 467.6	17 00	357 180	52 386
	48	8	8	1 488.82	.06	8	89 328.6	18 00	377 540	58 680
	49	8	9	1 519.84	.06	9	91 189.7	19 00	397 788	65 322
79	50	31.018	50	1 550.85	1861.06	50	93 050.7	20 00	417 920	72 310
	51	8	1	1 581.87	.06	1	94 911.8	21 00	437 930	79 641
	52	8	2	1 612.89	.07	2	96 772.9	22 00	457 811	87 315
	53	8	3	1 643.90	.07	3	98 633.9	23 00	477 557	95 328
	54	8	4	1 674.92	.07	4	100 495.0	24 00	497 164	103 678
79	55	31.018	55	1 705.94	1861.07	55	102 356.1	25 00	516 624	112 362
	56	8	6	1 736.96	.07	6	104 217.1	26 00	535 933	121 379
	57	8	7	1 767.97	.08	7	106 078.2	27 00	555 084	130 725
	58	8	8	1 798.99	.08	8	107 939.3	28 00	574 073	140 398
	59	8	9	1 830.01	.08	9	109 800.4	29 00	592 893	150 395
79	60	31.018	60	1 861.02	1861.08	60	111 661.4	30 00	611 539	160 713

Latitude 80° to 81°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
80 00	5.387	10.77	16.16	21.55	26.94	32.32	37.71	43.10	48.49	323.2	646.5	969.7	1293.0	1616.2
1	.378	.76	.13	.51	.89	.27	.65	3.03	.41	2.7	5.4	8.1	90.8	3.5
2	.370	.74	.11	.48	.85	.22	.59	2.96	.33	2.2	4.3	6.5	88.7	10.9
3	.361	.72	.08	.44	.80	.16	.52	.89	.25	1.6	3.3	4.9	6.6	08.2
4	.352	.70	.06	.41	.76	.11	.46	.81	.17	1.1	2.2	3.3	4.4	5.5
80 05	5.343	10.69	16.03	21.37	26.72	32.06	37.40	42.74	48.09	320.6	641.1	961.7	1282.3	1602.9
6	.334	.67	6.00	.34	.67	2.00	.34	.67	8.01	20.0	40.1	60.1	80.2	600.2
7	.325	.65	5.98	.30	.63	1.95	.28	.60	7.93	19.5	39.0	58.5	78.0	597.5
8	.316	.63	.95	.27	.59	.90	.21	.53	.85	9.0	7.9	6.9	5.9	4.9
9	.307	.61	.92	.23	.54	.84	.15	.46	.77	8.4	6.9	5.3	3.8	92.2
80 10	5.298	10.60	15.90	21.19	26.49	31.79	37.09	42.39	47.69	317.9	635.8	953.7	1271.6	1589.5
11	.290	.58	.87	.16	.45	.74	7.03	.32	.61	7.4	4.7	2.1	69.5	6.9
12	.281	.56	.84	.12	.40	.68	6.97	.25	.53	6.8	3.7	50.5	7.4	4.2
13	.272	.54	.82	.09	.36	.63	.90	.17	.45	6.3	2.6	48.9	5.2	81.5
14	.263	.53	.79	.05	.31	.58	.84	.10	.37	5.8	1.6	7.3	3.1	78.9
80 15	5.254	10.51	15.76	21.02	26.27	31.52	36.78	42.03	47.29	315.2	630.5	945.7	1261.0	1576.2
16	.245	.49	.74	0.98	.23	.47	.72	1.96	.21	4.7	29.4	4.1	58.8	3.5
17	.236	.47	.71	.95	.18	.42	.65	.89	.13	4.2	8.3	2.5	6.7	70.9
18	.227	.45	.68	.91	.14	.36	.59	.82	7.05	3.6	7.3	40.9	4.6	68.2
19	.218	.44	.66	.87	.09	.31	.53	.75	6.97	3.1	6.2	39.3	2.4	5.5
80 20	5.210	10.42	15.63	20.84	26.05	31.26	36.47	41.68	46.89	312.6	625.1	937.7	1250.3	1562.9
21	.201	.40	.60	.80	6.00	.20	.40	.61	.81	2.0	4.1	6.1	48.2	60.2
22	.192	.38	.58	.77	5.96	.15	.34	.54	.73	1.5	3.0	4.5	6.0	57.5
23	.183	.37	.55	.73	.92	.10	.28	.46	.65	1.0	1.9	2.9	3.9	4.9
24	.174	.35	.52	.70	.87	1.04	.22	.39	.57	10.4	20.9	31.3	41.7	52.2
80 25	5.165	10.33	15.49	20.66	25.83	30.99	36.15	41.32	46.49	309.9	619.8	929.7	1239.6	1549.5
26	.156	.31	.47	.62	.78	.94	.09	.25	.40	9.4	8.7	8.1	7.5	6.8
27	.147	.29	.44	.59	.74	.88	6.03	.18	.33	8.8	7.7	6.5	5.3	4.2
28	.138	.28	.41	.55	.69	.83	5.97	.11	.25	8.3	6.6	4.9	3.2	41.5
29	.129	.26	.39	.52	.65	.78	.90	1.03	.16	7.8	5.5	3.3	31.1	38.8
80 30	5.121	10.24	15.36	20.48	25.60	30.72	35.85	40.97	46.09	307.2	614.5	921.7	1228.9	1536.2
31	.112	.22	.33	.45	.56	.67	.78	.89	6.01	6.7	3.4	20.1	6.8	3.5
32	.103	.21	.31	.41	.51	.62	.72	.82	5.92	6.2	2.3	18.5	4.7	30.8
33	.094	.19	.28	.38	.47	.56	.66	.75	.85	5.6	1.3	6.9	2.5	28.2
34	.085	.17	.25	.34	.42	.51	.59	.68	.77	5.1	10.2	5.3	20.4	5.5
80 35	5.076	10.15	15.23	20.30	25.38	30.46	35.53	40.61	45.68	304.6	609.1	913.7	1218.3	1522.8
36	.067	.13	.20	.27	.34	.40	.47	.54	.60	4.0	8.1	2.1	6.1	20.1
37	.058	.12	.17	.23	.29	.35	.41	.47	.52	3.5	7.0	10.5	4.0	17.5
38	.049	.10	.15	.20	.25	.30	.35	.39	.44	3.0	5.9	08.9	11.8	4.8
39	.040	.08	.12	.16	.20	.24	.28	.32	.36	2.4	4.9	7.3	09.7	12.1
80 40	5.032	10.06	15.09	20.13	25.16	30.19	35.22	40.25	45.28	301.9	603.8	905.7	1207.6	1509.5
41	.023	.05	.07	.09	.11	.14	.16	.18	.20	1.4	2.7	4.1	5.4	6.8
42	.014	.03	.04	.05	.07	.08	.10	.11	.12	0.8	1.6	2.5	3.3	4.1
43	5.005	10.01	5.01	20.02	5.02	30.03	5.03	40.04	5.04	300.3	600.6	900.9	201.2	501.4
44	4.996	9.99	4.99	19.98	4.98	29.98	4.97	39.97	4.96	299.8	599.5	899.3	199.0	498.8
80 45	4.987	9.97	14.96	19.95	24.94	29.92	34.91	39.90	44.88	299.2	598.4	897.7	1196.9	1496.1
46	.978	.96	.93	.91	.89	.87	.85	.82	.80	8.7	7.4	6.1	4.7	3.4
47	.969	.94	.91	.88	.85	.82	.79	.75	.72	8.2	6.3	4.5	2.6	90.8
48	.960	.92	.88	.84	.80	.76	.72	.68	.64	7.6	5.2	2.9	90.5	88.1
49	.951	.90	.85	.81	.76	.71	.66	.61	.56	7.1	4.2	91.3	88.3	5.4
80 50	4.943	9.89	14.83	19.77	24.71	29.66	34.60	39.54	44.48	296.6	593.1	889.7	1186.2	1482.8
51	.934	.87	.80	.73	.67	.60	.54	.47	.40	6.0	2.0	8.0	4.1	80.1
52	.925	.85	.77	.70	.62	.55	.47	.40	.32	5.5	91.0	6.4	81.9	77.4
53	.916	.83	.75	.66	.58	.49	.41	.33	.24	4.9	89.9	4.8	79.8	4.7
54	.907	.81	.72	.63	.53	.44	.35	.26	.16	4.4	8.8	3.2	7.6	72.1
80 55	4.898	9.80	14.69	19.59	24.49	29.39	34.29	39.18	44.08	293.9	587.8	881.6	1175.5	1469.4
56	.889	.78	.67	.56	.45	.33	.22	.11	4.00	3.3	6.7	80.0	3.4	6.7
57	.880	.76	.64	.52	.40	.28	.16	9.04	3.92	2.8	5.6	78.4	71.2	4.0
58	.871	.74	.61	.48	.36	.23	.10	8.97	.84	2.3	4.5	6.8	69.1	61.4
59	.862	.72	.59	.45	.31	.17	4.04	.90	.76	1.7	3.5	5.2	6.9	58.7
80 60	4.853	9.71	14.56	19.41	24.27	29.12	33.97	38.83	43.68	291.2	582.4	873.6	1164.8	1456.0

Lat.		Latitude 80° to 81°.—Meridional arcs.						Latitude 80°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 80° 30′		Value of 1′	Continuous sums of minutes from latitude 80° 00′		Longitude.	X	Y
°	′	*Meters.*	″	*Meters.*	*Meters.*	′	*Meters.*	° ′	*Meters.*	*Meters.*
80	00	31.018			1861.08					
	1	8	1	31.02	.08	1	1 861.1	0 1	323.2	0.0
	2	8	2	62.04	.09	2	3 722.2	2	646.5	0.2
	3	8	3	93.06	.09	3	5 583.3	3	969.7	0.4
	4	8	4	124.08	.09	4	7 444.3	4	1 292.9	0.7
80	05	31.018	5	155.09	1861.09	5	9 305.4	0 5	1 616.2	1.2
	6	8	6	186.11	.09	6	11 166.5	6	1 939.4	1.7
	7	8	7	217.13	.10	7	13 027.6	7	2 262.7	2.3
	8	8	8	248.15	.10	8	14 888.7	8	2 585.9	3.0
	9	8	9	279.17	.10	9	16 749.8	9	2 909.1	3.7
80	10	31.018	10	310.19	1861.10	10	18 610.9	0 10	3 232.4	4.6
	11	8	1	341.21	.10	1	20 472.0	15	4 848.6	10.4
	12	8	2	372.23	.10	2	22 333.1	20	6 464.8	18.5
	13	8	3	403.25	.11	3	24 194.2	25	8 080.9	28.9
	14	8	4	434.27	.11	4	26 055.3	30	9 697.1	41.7
80	15	31.019	15	465.28	1861.11	15	27 916.4	0 35	11 313.2	56.7
	16	9	6	496.30	.11	6	29 777.5	40	12 929.3	74.1
	17	9	7	527.32	.11	7	31 638.7	45	14 545.4	93.8
	18	9	8	558.34	.12	8	33 499.8	50	16 161.4	115.7
	19	9	9	589.36	.12	9	35 360.9	55	17 777.5	140.1
80	20	31.019	20	620.38	1861.12	20	37 222.0	1 00	19 393.4	166.7
	21	9	1	651.40	.12	1	39 083.1	05	21 009.4	195.6
	22	9	2	682.42	.12	2	40 944.2	10	22 625.3	226.9
	23	9	3	713.44	.12	3	42 805.4	15	24 241.1	260.4
	24	9	4	744.45	.13	4	44 666.5	20	25 856.9	296.3
80	25	31.019	25	775.47	1861.13	25	46 527.6	1 25	27 472.7	334.5
	26	9	6	806.49	.13	6	48 388.7	30	29 088.4	375.0
	27	9	7	837.51	.13	7	50 249.9	35	30 704.0	417.8
	28	9	8	868.53	.13	8	52 111.0	40	32 319.6	462.9
	29	9	9	899.55	.14	9	53 972.1	45	33 935.1	510.3
80	30	31.019	30	930.57	1861.14	30	55 833.3	1 50	35 550.5	560.1
	31	9	1	961.59	.14	1	57 694.4	55	37 165.9	612.2
	32	9	2	992.61	.14	2	59 555.6	2 00	38 781	667
	33	9	3	1 023.63	.14	3	61 416.7	3 00	58 157	1 500
	34	9	4	1 054.64	.14	4	63 277.8	4 00	77 516	2 666
80	35	31.019	35	1 085.66	1861.15	35	65 139.0	5 00	96 853	4 164
	36	9	6	1 116.68	.15	6	67 000.1	6 00	116 160	5 995
	37	9	7	1 147.70	.15	7	68 861.3	7 00	135 433	8 157
	38	9	8	1 178.72	.15	8	70 722.4	8 00	154 667	10 651
	39	9	9	1 209.74	.15	9	72 583.6	9 00	173 854	13 474
80	40	31.019	40	1 240.76	1861.16	40	74 444.7	10 00	192 990	16 627
	41	9	1	1 271.78	.16	1	76 305.9	11 00	212 070	20 108
	42	9	2	1 302.80	.16	2	78 167.1	12 00	231 086	23 916
	43	9	3	1 333.82	.16	3	80 028.2	13 00	250 034	28 051
	44	9	4	1 364.83	.16	4	81 889.4	14 00	268 909	32 511
80	45	31.019	45	1 395.85	1861.16	45	83 750.5	15 00	287 704	37 295
	46	9	6	1 426.87	.17	6	85 611.7	16 00	306 414	42 401
	47	9	7	1 457.89	.17	7	87 472.9	17 00	325 033	47 828
	48	19	8	1 488.91	.17	8	89 334.0	18 00	343 557	53 574
	49	20	9	1 519.93	.17	9	91 195.2	19 00	361 978	59 637
80	50	31.020	50	1 550.95	1861.17	50	93 056.4	20 00	380 293	66 017
	51	0	1	1 581.97	.17	1	94 917.6	21 00	398 496	72 710
	52	0	2	1 612.99	.18	2	96 778.7	22 00	416 581	79 715
	53	0	3	1 644.00	.18	3	98 639.9	23 00	434 543	87 030
	54	0	4	1 675.02	.18	4	100 501.1	24 00	452 376	94 652
80	55	31.020	55	1 706.04	1861.18	55	102 362.3	25 00	470 076	102 580
	56	0	6	1 737.06	.18	6	104 223.5	26 00	487 637	110 811
	57	0	7	1 768.08	.19	7	106 084.6	27 00	505 054	119 342
	58	0	8	1 799.10	.19	8	107 945.8	28 00	522 322	128 172
	59	0	9	1 830.12	.19	9	109 807.0	29 00	539 435	137 297
80	60	31.020	60	1 861.14	1861.19	60	111 668.2	30 00	556 389	146 715

Latitude 81° to 82°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
81 00	4.853	9.71	14.56	19.41	24.27	29.12	33.97	38.83	43.68	291.2	582.4	873.6	1164.8	1456.0
1	.844	.69	.53	.38	.22	.07	.91	.75	.60	0.7	1.3	2.0	2.7	3.3
2	.836	.67	.51	.34	.18	9.01	.85	.69	.52	90.1	80.3	70.4	60.5	50.7
3	.827	.65	.48	.31	.13	8.96	.79	.61	.44	89.6	79.2	68.8	58.4	48.0
4	.818	.64	.45	.27	.09	.91	.72	.54	.36	9.1	8.1	7.2	6.3	5.3
81 05	4.809	9.62	14.43	19.23	24.04	28.85	33.66	38.47	43.28	288.5	577.1	865.6	1154.1	1442.6
6	.800	.60	.40	.20	4.00	.80	.60	.40	.20	8.0	6.0	4.0	52.0	40.0
7	.791	.58	.37	.16	3.96	.75	.54	.33	.12	7.5	4.9	2.4	49.8	37.3
8	.782	.56	.35	.13	.91	.69	.47	.26	3.04	6.9	3.8	60.8	7.7	4.6
9	.773	.55	.32	.09	.87	.64	.41	.18	2.96	6.4	2.8	59.2	5.6	31.9
81 10	4.764	9.53	14.29	19.06	23.82	28.59	33.35	38.11	42.88	285.9	571.7	957.6	1143.4	1429.3
11	.755	.51	.27	9.02	.78	.53	.29	8.04	.80	5.3	70.6	6.0	41.3	6.6
12	.746	.49	.24	8.99	.73	.48	.22	7.97	.72	4.8	69.6	4.4	39.1	3.9
13	.737	.47	.21	.95	.69	.42	.16	.90	.64	4.2	8.5	2.7	7.0	21.2
14	.729	.46	.19	.91	.64	.37	.10	.83	.56	3.7	7.4	51.1	4.9	18.6
81 15	4.720	9.44	14.16	18.88	23.60	28.32	33.04	37.76	42.48	283.2	566.4	849.5	1132.7	1415.9
16	.711	.42	.13	.84	.55	.26	2.98	.69	.40	2.6	5.3	7.9	30.6	3.2
17	.702	.40	.11	.81	.51	.21	.91	.61	.32	2.1	4.2	6.3	28.4	10.5
18	.693	.39	.08	.77	.47	.16	.85	.54	.23	1.6	3.1	4.7	6.3	07.9
19	.684	.37	.05	.74	.42	.10	.79	.47	.16	1.0	2.1	3.1	4.2	5.2
81 20	4.675	9.35	14.03	18.70	23.38	28.05	32.73	37.40	42.08	280.5	561.0	841.5	1122.0	1402.5
21	.666	.33	4.00	.66	.33	8.00	.66	.33	1.99	80.0	59.9	39.9	19.9	399.8
22	.657	.31	3.97	.63	.29	7.94	.60	.26	.92	79.4	8.9	8.3	7.7	7.2
23	.648	.30	.95	.59	.24	.89	.54	.19	.84	8.9	7.8	6.7	5.6	4.5
24	.639	.28	.92	.56	.20	.84	.48	.11	.75	8.4	6.7	5.1	3.5	91.8
81 25	4.630	9.26	13.89	18.52	23.15	27.78	32.41	37.04	41.67	277.8	555.7	833.5	1111.3	1389.1
26	.622	.24	.87	.48	.11	.73	.35	6.97	.59	7.3	4.6	1.9	09.2	6.5
27	.613	.22	.84	.45	.06	.68	.29	.90	.51	6.8	3.5	30.3	7.0	3.8
28	.604	.21	.81	.41	3.02	.62	.23	.83	.43	6.2	2.4	28.7	4.9	81.1
29	.595	.19	.78	.38	2.97	.57	.16	.76	.35	5.7	1.4	7.1	2.7	78.4
81 30	4.586	9.17	13.76	18.34	22.93	27.51	32.10	36.69	41.27	275.1	550.3	825.4	1100.6	1375.7
31	.577	.15	.73	.31	.89	.46	2.04	.62	.19	4.6	49.2	3.8	098.5	3.1
32	.568	.14	.70	.27	.84	.41	1.98	.54	.11	4.1	8.2	2.2	6.3	70.4
33	.559	.12	.68	.24	.80	.35	.91	.47	1.03	3.5	7.1	20.6	4.2	67.7
34	.550	.10	.65	.20	.75	.30	.85	.40	0.95	3.0	6.0	19.0	92.0	5.0
81 35	4.541	9.08	13.62	18.17	22.71	27.25	31.79	36.33	40.87	272.5	544.9	817.4	1089.9	1362.4
36	.532	.06	.60	.13	.66	.19	.73	.26	.79	1.9	3.9	5.8	7.7	59.7
37	.523	.05	.57	.09	.62	.14	.66	.19	.71	1.4	2.8	4.2	5.6	7.0
38	.514	.03	.54	.06	.57	.09	.60	.11	.63	0.9	1.7	2.6	3.5	4.3
39	.506	9.01	.52	8.02	.53	7.03	.54	6.05	.55	70.3	40.7	11.0	81.3	51.7
81 40	4.497	8.99	13.49	17.99	22.48	26.98	31.48	35.97	40.47	269.8	539.6	809.4	1079.2	1349.0
41	.488	.98	.46	.95	.44	.93	.41	.90	.39	9.3	8.5	7.8	7.0	6.3
42	.479	.96	.44	.91	.39	.87	.35	.83	.31	8.7	7.4	6.2	4.9	3.6
43	.470	.94	.41	.88	.35	.82	.29	.76	.23	8.2	6.4	4.6	2.7	40.9
44	.461	.92	.38	.84	.30	.77	.23	.69	.15	7.7	5.3	3.0	70.6	38.3
81 45	4.452	8.90	13.36	17.81	22.26	26.71	31.16	35.62	40.07	267.1	534.2	801.3	1068.5	1335.6
46	.443	.89	.33	.77	.22	.66	.10	.54	39.99	6.6	3.2	799.7	6.3	2.9
47	.434	.87	.30	.74	.17	.60	1.04	.47	.91	6.0	2.1	8.1	4.2	30.2
48	.425	.85	.27	.70	.13	.55	0.98	.40	.83	5.5	31.0	6.5	62.0	27.5
49	.416	.83	.25	.67	.08	.50	.91	.33	.75	5.0	30.0	4.9	59.9	4.9
81 50	4.407	8.81	13.22	17.63	22.04	26.44	30.85	35.26	39.67	264.4	528.9	793.3	1057.7	1322.2
51	.398	.80	.19	.59	1.99	.39	.79	.19	.59	3.9	7.8	1.7	5.6	19.5
52	.389	.78	.17	.56	.95	.34	.73	.11	.50	3.4	6.7	90.1	3.5	6.8
53	.380	.76	.14	.52	.90	.28	.66	5.04	.42	2.8	5.7	88.5	51.3	4.1
54	.372	.74	.11	.49	.86	.23	.60	4.97	.35	2.3	4.6	6.9	49.2	11.5
81 55	4.363	8.73	13.09	17.45	21.81	26.18	30.54	34.90	39.26	261.8	523.5	785.3	1047.0	1308.8
56	.354	.71	.06	.41	.77	.12	.48	.83	.18	1.2	2.4	3.7	4.9	6.1
57	.345	.69	.03	.38	.72	.07	.41	.76	.10	0.7	1.4	2.0	2.7	3.4
58	.336	.67	3.01	.34	.68	6.02	.35	.69	9.02	60.2	20.3	80.4	40.6	300.7
59	.327	.65	2.98	.31	.64	5.96	.29	.62	8.94	59.6	19.2	78.8	38.4	298.1
81 60	4.318	8.64	12.95	17.27	21.59	25.91	30.23	34.54	38.86	259.1	518.2	777.2	1036.3	1295.4

Lat.		Latitude 81° to 82°—Meridional arcs.						Latitude 81°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 81° 30′		Value of 1′	Continuous sums of minutes from latitude 81° 00′		Longitude.	X	Y
°	′	*Meters.*	″	*Meters.*	*Meters.*	′	*Meters.*	° ′	*Meters.*	*Meters.*
81	00	31.020			1861.19					
	1	0	1	31.02	.19	1	1 861.2	0 1	291.2	0.0
	2	0	2	62.04	.19	2	3 722.4	2	582.4	0.2
	3	0	3	93.06	.20	3	5 583.6	3	873.6	0.4
	4	0	4	124.08	.20	4	7 444.8	4	1 164.8	0.7
81	05	31.020	5	155.10	1861.20	5	9 306.0	0 5	1 456.0	1.0
	6	0	6	186.12	.20	6	11 167.2	6	1 747.2	1.5
	7	0	7	217.14	.20	7	13 028.4	7	2 038.4	2.0
	8	0	8	248.17	.20	8	14 889.6	8	2 329.6	2.7
	9	0	9	279.19	.21	9	16 750.8	9	2 620.8	3.4
81	10	31.020	10	310.21	1861.21	10	18 612.0	0 10	2 912.0	4.2
	11	0	1	341.23	.21	1	20 473.2	15	4 368.0	9.4
	12	0	2	372.25	.21	2	22 334.4	20	5 824.0	16.7
	13	0	3	403.27	.21	3	24 195.6	25	7 280.0	26.1
	14	0	4	434.29	.21	4	26 056.8	30	8 736.0	37.6
81	15	31.020	15	465.31	1861.22	15	27 918.0	0 35	10 191.9	51.2
	16	0	6	496.33	.22	6	29 779.3	40	11 647.9	66.9
	17	0	7	527.35	.22	7	31 640.5	45	13 103.8	84.7
	18	0	8	558.37	.22	8	33 501.7	50	14 559.6	104.6
	19	0	9	589.39	.22	9	35 362.9	55	16 015.5	126.5
81	20	31.020	20	620.41	1861.22	20	37 224.1	1 00	17 471.3	150.6
	21	0	1	651.43	.23	1	39 085.4	05	18 927.1	176.7
	22	0	2	682.45	.23	2	40 946.6	10	20 382.8	205.0
	23	0	3	713.48	.23	3	42 807.8	15	21 838.5	235.3
	24	1	4	744.50	.23	4	44 669.0	20	23 294.2	267.7
81	25	31.021	25	775.52	1861.23	25	46 530.3	1 25	24 749.8	302.2
	26	1	6	806.54	.23	6	48 391.5	30	26 205.3	338.8
	27	1	7	837.56	.24	7	50 252.7	35	27 660.8	377.5
	28	1	8	868.58	.24	8	52 114.0	40	29 116.3	418.3
	29	1	9	899.60	.24	9	53 975.2	45	30 571.7	461.2
81	30	31.021	30	930.62	1861.24	30	55 836.5	1 50	32 027.0	506.1
	31	1	1	961.64	.24	1	57 697.7	55	33 482.2	553.2
	32	1	2	992.66	.24	2	59 558.9	2 00	34 937	602
	33	1	3	1 023.68	.24	3	61 420.2	3 00	52 393	1 355
	34	1	4	1 054.70	.25	4	63 281.4	4 00	69 833	2 409
81	35	31.021	35	1 085.72	1861.25	35	65 142.7	5 00	87 253	3 763
	36	1	6	1 116.74	.25	6	67 003.9	6 00	104 646	5 417
	37	1	7	1 147.76	.25	7	68 865.2	7 00	122 009	7 370
	38	1	8	1 178.79	.25	8	70 726.4	8 00	139 335	9 623
	39	1	9	1 209.81	.25	9	72 587.7	9 00	156 620	12 174
81	40	31.021	40	1 240.83	1861.26	40	74 448.9	10 00	173 858	15 022
	41	1	1	1 271.85	.26	1	76 310.2	11 00	191 044	18 168
	42	1	2	1 302.87	.26	2	78 171.5	12 00	208 174	21 609
	43	1	3	1 333.89	.26	3	80 032.7	13 00	225 242	25 344
	44	1	4	1 364.91	.26	4	81 894.0	14 00	242 243	29 374
81	45	31.021	45	1 395.93	1861.26	45	83 755.2	15 00	259 172	33 696
	46	1	6	1 426.95	.27	6	85 616.5	16 00	276 024	38 309
	47	1	7	1 457.97	.27	7	87 477.8	17 00	292 794	43 212
	48	1	8	1 488.99	.27	8	89 339.0	18 00	309 477	48 403
	49	1	9	1 520.01	.27	9	91 200.3	19 00	326 068	53 881
81	50	31.021	50	1 551.03	1861.27	50	93 061.6	20 00	342 562	59 644
	51	1	1	1 582.05	.27	1	94 922.9	21 00	358 954	65 691
	52	1	2	1 613.07	.27	2	96 784.1	22 00	375 240	72 019
	53	1	3	1 644.10	.28	3	98 645.4	23 00	391 414	78 627
	54	1	4	1 675.12	.28	4	100 506.7	24 00	407 472	85 513
81	55	31.021	55	1 706.14	1861.28	55	102 368.0	25 00	423 408	92 675
	56	1	6	1 737.16	.28	6	104 229.3	26 00	439 219	100 110
	57	1	7	1 768.18	.28	7	106 090.5	27 00	454 900	107 817
	58	1	8	1 799.20	.28	8	107 951.8	28 00	470 445	115 793
	59	1	9	1 830.22	.29	9	109 813.1	29 00	485 850	124 036
81	60	31.021	60	1 861.24	1861.29	60	111 674.4	30 00	501 111	132 543

Latitude 82° to 83°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
82 00	4.318	8.64	12.95	17.27	21.59	25.91	30.23	34.54	38.86	259.1	518.2	777.2	1036.3	1295.4
1	.309	.62	.93	.24	.55	.85	.16	.47	.78	8.5	7.1	5.6	4.2	2.7
2	.300	.60	.90	.20	.50	.80	.10	.40	.70	8.0	6.0	4.0	32.0	90.0
3	.291	.58	.87	.16	.46	.75	30.04	.33	.62	7.5	4.9	2.4	29.9	87.3
4	.282	.56	.85	.13	.41	.69	29.98	.26	.54	6.9	3.9	70.8	7.7	4.6
82 05	4.273	8.55	12.82	17.09	21.37	25.64	29.91	34.18	38.46	256.4	512.8	769.2	1025.6	1282.0
6	.264	.53	.79	.06	.32	.59	.85	.11	.38	5.9	1.7	7.6	3.4	79.3
7	.255	.51	.77	17.02	.28	.53	.79	4.04	.30	5.3	10.6	6.0	21.3	6.6
8	.246	.49	.74	6.99	.23	.48	.72	3.97	.22	4.8	09.6	4.4	19.1	3.9
9	.237	.47	.71	.95	.19	.42	.66	.90	.14	4.2	8.5	2.7	7.0	71.2
82 10	4.229	8.46	12.69	16.91	21.14	25.37	29.60	33.83	38.06	253.7	507.4	761.1	1014.8	1268.6
11	.220	.44	.66	.88	.10	.32	.54	.76	7.98	3.2	6.4	59.5	2.7	5.9
12	.211	.42	.63	.84	.05	.26	.47	.69	.90	2.6	5.3	7.9	10.6	3.2
13	.202	.40	.61	.81	1.01	.21	.41	.61	.82	2.1	4.2	6.3	08.4	60.5
14	.193	.39	.58	.77	0.96	.16	.35	.54	.73	1.6	3.1	4.7	6.3	57.8
82 15	4.184	8.37	12.55	16.74	20.92	25.10	29.29	33.47	37.65	251.0	502.0	753.1	1004.1	1255.1
16	.175	.35	.53	.70	.88	.05	.22	.40	.57	0.5	501.0	51.5	1002.0	52.5
17	.166	.33	.50	.66	.83	5.00	.16	.33	.49	50.0	499.9	49.9	999.8	49.8
18	.157	.31	.47	.63	.79	4.94	.10	.25	.41	49.4	8.8	8.3	7.7	7.1
19	.148	.30	.44	.59	.74	.89	9.04	.18	.33	8.9	7.8	6.6	5.5	4.4
82 20	4.139	8.28	12.42	16.56	20.70	24.83	28.97	33.11	37.25	248.3	496.7	745.0	993.4	1241.7
21	.130	.26	.39	.52	.65	.78	.91	3.04	.17	7.8	5.6	3.4	91.2	39.1
22	.121	.24	.36	.49	.61	.73	.85	2.97	.09	7.3	4.5	1.8	89.1	6.4
23	.112	.22	.34	.45	.56	.67	.78	.90	7.01	6.7	3.5	40.2	6.9	3.7
24	.103	.21	.31	.41	.52	.62	.72	.83	6.93	6.2	2.4	38.6	4.8	31.0
82 25	4.094	8.19	12.28	16.38	20.47	24.57	28.66	32.75	36.85	245.7	491.3	737.0	982.7	1228.3
26	.085	.17	.26	.34	.43	.51	.60	.68	.77	5.1	90.2	5.4	80.5	5.6
27	.076	.15	.23	.31	.38	.46	.53	.61	.69	4.6	89.2	3.8	78.4	2.9
28	.068	.14	.20	.27	.34	.41	.47	.54	.61	4.1	8.1	2.2	6.2	20.3
29	.059	.12	.18	.23	.29	.35	.41	.47	.53	3.5	7.0	30.5	4.1	17.6
82 30	4.050	8.10	12.15	16.20	20.25	24.30	28.35	32.40	36.45	243.0	486.0	728.9	971.9	1214.9
31	.041	.08	.12	.16	.20	.24	.28	.33	.37	2.4	4.9	7.3	69.8	12.2
32	.032	.06	.10	.13	.16	.19	.22	.25	.29	1.9	3.8	5.7	7.6	09.5
33	.023	.05	.07	.09	.12	.14	.16	.18	.21	1.4	2.7	4.1	5.5	6.9
34	.014	.03	.04	.06	.07	.08	.10	.11	.13	0.8	1.7	2.5	3.3	4.2
82 35	4.005	8.01	12.02	16.02	20.03	24.03	28.03	32.04	36.04	240.3	480.6	720.9	961.2	1201.5
36	3.996	7.99	1.99	5.98	19.98	3.98	7.97	1.97	5.96	39.8	79.5	19.3	59.0	198.8
37	.987	.97	.96	.95	.94	.92	.91	.90	.88	9.2	8.4	7.7	6.9	6.1
38	.978	.96	.93	.91	.89	.87	.85	.82	.80	8.7	7.4	6.1	4.7	3.4
39	.969	.94	.91	.88	.85	.81	.78	.75	.72	8.1	6.3	4.4	2.6	90.7
82 40	3.960	7.92	11.88	15.84	19.80	23.76	27.72	31.68	35.64	237.6	475.2	712.8	950.4	1188.1
41	.951	.90	.85	.81	.76	.71	.66	.61	.56	7.1	4.2	11.2	48.3	5.4
42	.942	.88	.83	.77	.71	.65	.60	.54	.48	6.5	3.1	09.6	6.1	2.7
43	.933	.87	.80	.73	.67	.60	.53	.47	.40	6.0	2.0	8.0	4.0	80.0
44	.924	.85	.77	.70	.62	.55	.47	.39	.32	5.5	70.9	6.4	41.8	77.3
82 45	3.915	7.83	11.75	15.66	19.58	23.49	27.41	31.32	35.24	234.9	469.9	704.8	939.7	1174.6
46	.906	.81	.72	.63	.53	.44	.34	.25	.16	4.4	8.8	3.2	7.6	71.9
47	.898	.80	.69	.59	.49	.39	.28	.18	.08	3.9	7.7	701.6	5.4	69.3
48	.889	.78	.67	.55	.44	.33	.22	.11	5.00	3.3	6.6	699.9	3.3	6.6
49	.880	.76	.64	.52	.40	.28	.16	1.04	4.92	2.8	5.6	8.3	31.1	3.9
82 50	3.871	7.74	11.61	15.48	19.35	23.22	27.09	30.97	34.84	232.2	464.5	696.7	929.0	1161.2
51	.862	.72	.58	.45	.31	.17	7.03	.89	.76	1.7	3.4	5.1	6.8	58.5
52	.853	.71	.56	.41	.26	.12	6.97	.82	.67	1.2	2.3	3.5	4.7	5.8
53	.844	.69	.53	.37	.22	.06	.90	.75	.59	0.6	1.3	1.9	2.5	3.1
54	.835	.67	.50	.34	.17	3.01	.84	.68	.52	30.1	60.2	90.3	20.4	50.5
82 55	3.826	7.65	11.48	15.30	19.13	22.96	26.78	30.61	34.43	229.6	459.1	688.7	918.2	1147.8
56	.817	.63	.45	.27	.09	.90	.72	.54	.35	9.0	8.0	7.0	6.1	5.1
57	.808	.62	.42	.23	.04	.85	.66	.46	.27	8.5	7.0	5.4	3.9	42.4
58	.799	.60	.40	.20	9.00	.79	.59	.39	.19	7.9	5.9	3.8	11.8	39.7
59	.790	.58	.37	.16	8.95	.74	.53	.32	.11	7.4	4.8	2.2	09.6	7.0
82 60	3.781	7.56	11.34	15.12	18.91	22.69	26.47	30.25	34.03	226.9	453.7	680.6	907.5	1134.3

Lat.		Latitude 82° to 83°—Meridional arcs.						Latitude 82°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 82° 30′		Value of 1′	Continuous sums of minutes from latitude 82° 00′		Longitude.	X	Y
°	′	*Meters.*	″	*Meters.*	*Meters.*	′	*Meters.*	° ′	*Meters.*	*Meters.*
82	00	31.021			1861.29					
	1	1	1	31.02	.29	1	1 861.3	0 1	259.1	0.0
	2	2	2	62.04	.29	2	3 722.6	2	518.1	0.2
	3	2	3	93.07	.29	3	5 583.9	3	777.2	0.3
	4	2	4	124.09	.29	4	7 445.2	4	1 036.3	0.6
82	05	31.022	5	155.11	1861.29	5	9 306.5	0 5	1 295.4	0.9
	6	2	6	186.13	.30	6	11 167.7	6	1 554.5	1.3
	7	2	7	217.16	.30	7	13 029.0	7	1 813.5	1.8
	8	2	8	248.18	.30	8	14 890.3	8	2 072.6	2.4
	9	2	9	279.20	.30	9	16 751.6	9	2 331.7	3.0
82	10	31.022	10	310.22	1861.30	10	18 612.9	0 10	2 590.8	3.7
	11	2	1	341.24	.30	1	20 474.2	15	3 886.1	8.4
	12	2	2	372.27	.30	2	22 335.6	20	5 181.5	14.9
	13	2	3	403.29	.31	3	24 196.9	25	6 476.8	23.3
	14	2	4	434.31	.31	4	26 058.2	30	7 772.2	33.6
82	15	31.022	15	465.33	1861.31	15	27 919.5	0 35	9 067.5	45.7
	16	2	6	496.36	.31	6	29 780.8	40	10 362.8	59.7
	17	2	7	527.38	.31	7	31 642.1	45	11 658.1	75.6
	18	2	8	558.40	.31	8	33 503.4	50	12 953.3	93.3
	19	2	9	589.42	.32	9	35 364.7	55	14 248.5	112.9
82	20	31.022	20	620.44	1861.32	20	37 226.0	1 00	15 543.7	134.3
	21	2	1	651.47	.32	1	39 087.4	05	16 838.9	157.6
	22	2	2	682.49	.32	2	40 948.7	10	18 134.0	182.8
	23	2	3	713.51	.32	3	42 810.0	15	19 429.1	209.9
	24	2	4	744.53	.32	4	44 671.3	20	20 724.2	238.8
82	25	31.022	25	775.55	1861.32	25	46 532.6	1 25	22 019.2	269.6
	26	2	6	806.58	.33	6	48 394.0	30	23 314.2	302.2
	27	2	7	837.60	.33	7	50 255.3	35	24 609.1	336.7
	28	2	8	868.62	.33	8	52 116.6	40	25 904.0	373.1
	29	2	9	899.64	.33	9	53 978.0	45	27 198.8	411.4
82	30	31.022	30	930.67	1861.33	30	55 839.3	1 50	28 493.5	451.5
	31	2	1	961.69	.33	1	57 700.6	55	29 788.2	493.5
	32	2	2	992.71	.33	2	59 562.0	2 00	31 083	537
	33	2	3	1 023.73	.34	3	61 423.3	3 00	46 613	1 209
	34	2	4	1 054.75	.34	4	63 284.6	4 00	62 129	2 148
82	35	31.022	35	1 085.78	1861.34	35	65 146.0	5 00	77 626	3 356
	36	2	6	1 116.80	.34	6	67 007.3	6 00	93 100	4 832
	37	2	7	1 147.82	.34	7	68 868.6	7 00	108 546	6 574
	38	2	8	1 178.84	.34	8	70 730.0	8 00	123 960	8 583
	39	2	9	1 209.87	.34	9	72 591.3	9 00	139 337	10 859
82	40	31.022	40	1 240.89	1861.35	40	74 452.7	10 00	154 672	13 400
	41	2	1	1 271.91	.35	1	76 314.0	11 00	169 962	16 205
	42	2	2	1 302.93	.35	2	78 175.4	12 00	185 200	19 274
	43	2	3	1 333.95	.35	3	80 036.7	13 00	200 383	22 607
	44	3	4	1 364.98	.35	4	81 898.1	14 00	215 506	26 201
82	45	31.023	45	1 396.00	1861.35	45	83 759.4	15 00	230 565	30 056
	46	3	6	1 427.02	.35	6	85 620.8	16 00	245 555	34 170
	47	3	7	1 458.04	.36	7	87 482.1	17 00	260 471	38 543
	48	3	8	1 489.07	.36	8	89 343.5	18 00	275 310	43 173
	49	3	9	1 520.09	.36	9	91 204.9	19 00	290 066	48 059
82	50	31.023	50	1 551.11	1861.36	50	93 066.2	20 00	304 736	53 200
	51	3	1	1 582.13	.36	1	94 927.6	21 00	319 315	58 593
	52	3	2	1 613.15	.36	2	96 788.9	22 00	333 798	64 237
	53	3	3	1 644.18	.36	3	98 650.3	23 00	348 182	70 130
	54	3	4	1 675.20	.36	4	100 511.7	24 00	362 462	76 272
82	55	31.023	55	1 706.22	1861.37	55	102 373.0	25 00	376 633	82 659
	56	3	6	1 737.24	.37	6	104 234.4	26 00	390 692	89 290
	57	3	7	1 768.26	.37	7	106 095.8	27 00	404 634	96 163
	58	3	8	1 799.29	.37	8	107 957.1	28 00	418 456	103 276
	59	3	9	1 830.31	.37	9	109 818.5	29 00	432 152	110 627
82	60	31.023	60	1 861.33	1861.37	60	111 679.9	30 00	445 719	118 214

Latitude 83° to 84°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
83 00	3.781	7.56	11.34	15.12	18.91	22.69	26.47	30.25	34.03	226.9	453.7	680.6	907.5	1134.3
1	.772	.55	.32	.09	.86	.63	.41	.18	3.95	6.3	2.7	79.0	5.3	1.7
2	.763	.53	.29	.05	.82	.58	.34	.11	.87	5.8	1.6	7.4	3.2	29.0
3	.754	.51	.26	5.02	.77	.53	.28	30.03	.79	5.3	50.6	5.8	901.0	6.3
4	.745	.49	.24	4.98	.73	.47	.22	29.96	.71	4.7	49.4	4.1	898.9	3.6
83 05	3.736	7.47	11.20	14.95	18.68	22.42	26.16	29.89	33.63	224.2	448.4	672.5	896.7	1120.9
6	.727	.45	.18	.91	.64	.36	.09	.82	.55	3.6	7.3	70.9	4.6	18.2
7	.718	.44	.15	.87	.59	.31	6.03	.75	.46	3.1	6.2	69.3	2.4	5.5
8	.709	.42	.13	.84	.55	.26	5.97	.67	.38	2.6	5.1	7.7	90.3	2.8
9	.700	.40	.10	.80	.50	.20	.90	.60	.30	2.0	4.1	6.1	88.1	10.1
83 10	3.692	7.38	11.07	14.77	18.46	22.15	25.84	29.53	33.22	221.5	443.0	664.5	886.0	1107.5
11	.683	.36	.05	.73	.41	.10	.78	.46	.14	1.0	1.9	2.9	3.8	4.8
12	.674	.35	1.02	.69	.37	2.04	.72	.39	3.06	20.4	40.8	61.2	81.7	102.1
13	.665	.33	0.99	.66	.32	1.99	.65	.32	2.98	19.9	39.8	59.6	79.5	099.4
14	.656	.31	.97	.62	.28	.93	.59	.25	.90	9.3	8.7	8.0	7.4	6.7
83 15	3.647	7.29	10.94	14.59	18.23	21.88	25.53	29.17	32.82	218.8	437.6	656.4	875.2	1094.0
16	.638	.28	.91	.55	.19	.83	.46	.10	.74	8.3	6.5	4.8	3.1	91.3
17	.629	.26	.89	.51	.14	.77	.40	9.03	.66	7.7	5.4	3.2	70.9	88.6
18	.620	.24	.86	.48	.10	.72	.34	8.96	.58	7.2	4.4	1.6	68.8	6.0
19	.611	.22	.83	.44	.06	.67	.27	.89	.50	6.7	3.3	50.0	6.6	3.3
83 20	3.602	7.20	10.81	14.41	18.01	21.61	25.21	28.82	32.42	216.1	432.2	648.3	864.5	1080.6
21	.593	.19	.78	.37	7.97	.56	.15	.74	.34	5.6	1.2	6.7	2.3	77.9
22	.584	.17	.75	.34	.92	.50	.09	.67	.26	5.0	30.1	5.1	60.2	5.2
23	.575	.15	.73	.30	.88	.45	5.02	.60	.18	4.5	29.0	3.5	58.0	72.5
24	.566	.13	.70	.26	.83	.40	4.96	.53	.09	4.0	7.9	1.9	5.9	69.8
83 25	3.557	7.11	10.67	14.23	17.79	21.34	24.90	28.46	32.01	213.4	426.9	640.3	853.7	1067.1
26	.548	.10	.64	.19	.74	.29	.84	.38	1.93	2.9	5.8	38.7	51.6	4.4
27	.539	.08	.62	.16	.70	.24	.78	.31	.85	2.4	4.7	7.1	49.4	61.8
28	.530	.06	.59	.12	.65	.18	.71	.24	.77	1.8	3.6	5.4	7.3	59.1
29	.521	.04	.56	.09	.61	.13	.65	.17	.69	1.3	2.6	3.8	5.1	6.4
83 30	3.512	7.02	10.54	14.05	17.56	21.07	24.59	28.10	31.61	210.7	421.5	632.2	843.0	1053.7
31	.503	7.01	.51	4.01	.52	1.02	.52	8.03	.53	10.2	20.4	30.6	40.8	51.0
32	.494	6.99	.48	3.98	.47	0.97	.46	7.95	.45	09.7	19.3	29.0	38.6	48.3
33	.485	.97	.46	.94	.43	.91	.40	.88	.37	9.1	8.2	7.4	6.5	5.6
34	.476	.95	.43	.91	.38	.86	.33	.81	.29	8.6	7.2	5.8	4.3	2.9
83 35	3.467	6.93	10.40	13.87	17.34	20.80	24.27	27.74	31.21	208.0	416.1	624.1	832.2	1040.2
36	.458	.92	.38	.83	.29	.75	.21	.67	.12	7.5	5.0	2.5	30.0	37.5
37	.450	.90	.35	.80	.25	.70	.15	.60	1.05	7.0	3.9	20.9	27.9	4.9
38	.441	.88	.32	.76	.20	.64	.08	.52	0.97	6.4	2.9	19.3	5.7	32.2
39	.432	.86	.30	.73	.16	.59	4.02	.45	.88	5.9	1.8	7.7	3.6	29.5
83 40	3.423	6.85	10.27	13.69	17.11	20.54	23.96	27.38	30.80	205.4	410.7	616.1	821.4	1026.8
41	.414	.83	.24	.65	.07	.48	.90	.31	.72	4.8	09.6	4.5	19.3	4.1
42	.405	.81	.21	.62	7.02	.43	.83	.24	.64	4.3	8.6	2.8	7.1	21.4
43	.396	.79	.19	.58	6.98	.37	.77	.17	.56	3.7	7.5	11.2	5.0	18.7
44	.387	.77	.16	.55	.93	.32	.71	.09	.48	3.2	6.4	09.6	2.8	6.0
83 45	3.378	6.76	10.13	13.51	16.89	20.27	23.64	27.02	30.40	202.7	405.3	608.0	810.7	1013.3
46	.369	.74	.11	.47	.84	.21	.58	6.95	.32	2.1	4.3	6.4	08.5	10.6
47	.360	.72	.08	.44	.80	.16	.52	.88	.24	1.6	3.2	4.8	6.4	07.9
48	.351	.70	.05	.40	.75	.11	.46	.81	.16	1.1	2.1	3.2	4.2	5.3
49	.342	.68	.03	.37	.71	.05	.39	.74	.08	0.5	1.0	601.5	802.1	1002.6
83 50	3.333	6.67	10.00	13.33	16.67	20.00	23.33	26.66	30.00	200.0	400.0	599.9	799.9	999.9
51	.324	.65	9.97	.30	.62	19.94	.27	.59	29.92	199.4	398.9	8.3	7.7	7.2
52	.315	.63	.95	.26	.58	.89	.20	.52	.84	8.9	7.8	6.7	5.6	4.5
53	.306	.61	.92	.22	.53	.84	.14	.45	.75	8.4	6.7	5.1	3.4	91.8
54	.297	.59	.89	.19	.49	.78	.08	.38	.67	7.8	5.6	3.5	91.3	89.1
83 55	3.288	6.58	9.86	13.15	16.44	19.73	23.01	26.30	29.59	197.3	394.6	591.8	789.1	986.4
56	.279	.56	.84	.11	.40	.67	2.95	.23	.51	6.7	3.5	90.2	7.0	3.7
57	.270	.54	.81	.08	.35	.62	.89	.16	.43	6.2	2.4	88.6	4.8	81.0
58	.261	.52	.78	.04	.31	.57	.83	.09	.35	5.7	1.3	7.0	2.7	78.3
59	.252	.50	.76	3.01	.26	.51	.76	6.02	.27	5.1	90.3	5.4	80.5	5.6
83 60	3.243	6.49	9.73	12.97	16.22	19.46	22.70	25.94	29.19	194.6	389.2	583.8	778.4	972.9

Lat.		Latitude 83° to 84°—Meridional arcs.						Latitude 83°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 83° 30′		Value of 1′	Continuous sums of minutes from latitude 83° 00′		Longitude.	X	Y
°	′	Meters.	″	Meters.	Meters.	′	Meters.	° ′	Meters.	Meters.
83	00	31.023			1861.37					
	1	3	1	31.02	.38	1	1 861.4	0 1	226.9	0.0
	2	3	2	62.05	.38	2	3 722.7	2	453.7	0.1
	3	3	3	93.07	.38	3	5 584.1	3	680.6	0.3
	4	3	4	124.09	.38	4	7 445.5	4	907.5	0.5
83	05	31.023	5	155.12	1861.38	5	9 306.9	0 5	1 134.3	0.8
	6	3	6	186.14	.38	6	11 168.3	6	1 361.2	1.2
	7	3	7	217.16	.38	7	13 029.6	7	1 588.1	1.6
	8	3	8	248.19	.38	8	14 891.0	8	1 814.9	2.1
	9	3	9	279.21	.39	9	16 752.4	9	2 041.8	2.7
83	10	31.023	10	310.24	1861.39	10	18 613.8	0 10	2 268.7	3.3
	11	3	1	341.26	.39	1	20 475.2	15	3 403.0	7.4
	12	3	2	372.28	.39	2	22 336.6	20	4 537.3	13.1
	13	3	3	403.31	.39	3	24 197.9	25	5 671.6	20.5
	14	3	4	434.33	.39	4	26 059.3	30	6 805.9	29.5
83	15	31.023	15	465.35	1861.39	15	27 920.7	0 35	7 940.2	40.1
	16	3	6	496.38	.39	6	29 782.1	40	9 074.5	52.4
	17	3	7	527.40	.40	7	31 643.5	45	10 208.7	66.3
	18	3	8	558.42	.40	8	33 504.9	50	11 343.0	81.9
	19	3	9	589.45	.40	9	35 366.3	55	12 477.2	99.1
83	20	31.023	20	620.47	1861.40	20	37 227.7	1 00	13 611.4	117.9
	21	3	1	651.49	.40	1	39 089.1	05	14 745.5	138.4
	22	3	2	682.52	.40	2	40 950.5	10	15 879.6	160.5
	23	3	3	713.54	.40	3	42 811.9	15	17 013.7	184.2
	24	3	4	744.56	.40	4	44 673.3	20	18 147.8	209.6
83	25	31.023	25	775.59	1861.41	25	46 534.7	1 25	19 281.8	236.6
	26	3	6	806.61	.41	6	48 396.1	30	20 415.8	265.3
	27	3	7	837.64	.41	7	50 257.5	35	21 549.7	295.6
	28	3	8	868.66	.41	8	52 118.9	40	22 683.6	327.5
	29	4	9	899.68	.41	9	53 980.3	45	23 817.4	361.1
83	30	31.024	30	930.71	1861.41	30	55 841.7	1 50	24 951.2	396.3
	31	4	1	961.73	.41	1	57 703.2	55	26 084.9	433.1
	32	4	2	992.75	.41	2	59 564.6	2 00	27 219	472
	33	4	3	1 023.78	.42	3	61 426.0	3 00	40 818	1 061
	34	4	4	1 054.80	.42	4	63 287.4	4 00	54 405	1 886
83	35	31.024	35	1 085.82	1861.42	35	65 148.8	5 00	67 975	2 946
	36	4	6	1 116.85	.42	6	67 010.2	6 00	81 525	4 241
	37	4	7	1 147.87	.42	7	68 871.7	7 00	95 051	5 770
	38	4	8	1 178.89	.42	8	70 733.1	8 00	108 548	7 534
	39	4	9	1 209.92	.42	9	72 594.5	9 00	122 013	9 531
83	40	31.024	40	1 240.94	1861.42	40	74 455.9	10 00	135 441	11 761
	41	4	1	1 271.96	.43	1	76 317.3	11 00	148 828	14 223
	42	4	2	1 302.99	.43	2	78 178.8	12 00	162 171	16 917
	43	4	3	1 334.01	.43	3	80 040.2	13 00	175 465	19 841
	44	4	4	1 365.04	.43	4	81 901.6	14 00	188 706	22 996
83	45	31.024	45	1 396.06	1861.43	45	83 763.1	15 00	201 891	26 379
	46	4	6	1 427.08	.43	6	85 624.5	16 00	215 015	29 990
	47	4	7	1 458.11	.43	7	87 485.9	17 00	228 074	33 828
	48	4	8	1 489.13	.43	8	89 347.4	18 00	241 065	37 892
	49	4	9	1 520.15	.43	9	91 208.8	19 00	253 984	42 180
83	50	31.024	50	1 551.18	1861.44	50	93 070.2	20 00	266 827	46 691
	51	4	1	1 582.20	.44	1	94 931.7	21 00	279 589	51 424
	52	4	2	1 613.22	.44	2	96 793.1	22 00	292 268	56 377
	53	4	3	1 644.25	.44	3	98 654.5	23 00	304 859	61 549
	54	4	4	1 675.27	.44	4	100 516.0	24 00	317 358	66 939
83	55	31.024	55	1 706.29	1861.44	55	102 377.4	25 00	329 763	72 544
	56	4	6	1 737.32	.44	6	104 238.9	26 00	342 068	78 363
	57	4	7	1 768.34	.44	7	106 100.3	27 00	354 270	84 395
	58	4	8	1 799.36	.45	8	107 961.8	28 00	366 367	90 637
	59	4	9	1 830.39	.45	9	109 823.2	29 00	378 353	97 088
83	60	31.024	60	1 861.41	1861.45	60	111 684.7	30 00	390 226	103 745

Latitude 84° to 85°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
84 00	3.243	6.49	9.73	12.97	16.22	19.46	22.70	25.94	29.19	194.6	389.2	583.8	778.4	972.9
1	.234	.47	.70	.94	.17	.41	.64	.87	.11	4.1	8.1	2.2	6.2	70.3
2	.225	.45	.68	.90	.13	.35	.58	.80	9.03	3.5	7.0	80.5	4.0	67.6
3	.216	.43	.65	.86	.08	.30	.51	.73	8.95	3.0	5.9	78.9	71.9	4.9
4	.207	.41	.62	.83	6.04	.24	.45	.66	.87	2.4	4.9	7.3	69.7	62.2
84 05	3.198	6.40	9.59	12.79	15.99	9.19	22.39	25.59	28.78	191.9	383.8	575.7	767.6	959.5
6	.189	.38	.57	.76	6.95	.14	.33	.51	.70	1.4	2.7	4.1	5.4	6.8
7	.180	.36	.54	.72	.90	.08	.26	.44	.62	0.8	1.6	2.5	3.3	4.1
8	.171	.34	.51	.69	.86	9.03	.20	.37	.54	90.3	80.6	70.8	61.1	51.4
9	.162	.32	.49	.65	.81	8.97	.14	.30	.46	89.7	79.5	69.2	59.0	48.7
84 10	3.153	6.31	9.46	12.61	15.77	18.92	22.07	25.23	28.38	189.2	378.4	567.6	756.8	946.0
11	.144	.29	.43	.58	.72	.87	2.01	.15	.30	8.7	7.3	6.0	4.7	3.3
12	.135	.27	.41	.54	.68	.81	1.95	.08	.22	8.1	6.2	4.4	2.5	40.6
13	.126	.25	.38	.50	.63	.76	.88	5.01	.14	7.6	5.2	2.8	50.3	37.9
14	.117	.23	.35	.47	.59	.70	.82	4.94	8.06	7.0	4.1	61.1	48.2	5.2
84 15	3.108	6.22	9.33	12.43	15.54	18.65	21.76	24.87	27.97	186.5	373.0	559.5	746.0	932.5
16	.099	.20	.30	.40	.50	.60	.70	.79	.89	6.0	1.9	7.9	3.9	29.8
17	.091	.18	.27	.36	.45	.54	.63	.73	.82	5.4	70.9	6.3	41.7	7.2
18	.082	.16	.24	.33	.41	.49	.57	.65	.73	4.9	69.8	4.7	39.6	4.5
19	.073	.14	.22	.29	.36	.44	.51	.58	.65	4.4	8.7	3.1	7.4	21.8
84 20	3.064	6.13	9.19	12.25	15.32	18.38	21.45	24.51	27.57	183.8	367.6	551.4	735.3	919.1
21	.055	.11	.16	.22	.27	.33	.38	.44	.49	3.3	6.5	49.8	3.1	6.4
22	.046	.09	.14	.18	.23	.27	.32	.37	.41	2.7	5.5	8.2	30.9	3.7
23	.037	.07	.11	.14	.18	.22	.26	.29	.33	2.2	4.4	6.6	28.8	11.0
24	.028	.06	.08	.11	.14	.17	.19	.22	.25	1.7	3.3	5.0	6.6	08.3
84 25	3.019	6.04	9.06	12.07	15.09	18.11	21.13	24.15	27.17	181.1	362.2	543.4	724.5	905.6
26	.010	.02	.03	.04	.05	.06	.07	.08	.09	0.6	1.2	1.7	2.3	2.9
27	3.001	6.00	9.00	2.00	5.00	8.00	1.00	4.01	7.01	80.0	60.1	40.1	20.2	900.2
28	2.992	5.99	8.97	1.97	4.96	7.95	0.94	3.93	6.92	79.5	59.0	38.5	18.0	897.5
29	.983	.97	.95	.93	.91	.90	.88	.86	.84	9.0	7.9	6.9	5.9	4.8
84 30	2.974	5.95	8.92	11.89	14.87	17.84	20.82	23.79	26.76	178.4	356.8	535.3	713.7	892.1
31	.965	.93	.89	.86	.82	.79	.75	.72	.68	7.9	5.8	3.7	11.5	89.4
32	.956	.91	.87	.82	.78	.73	.69	.65	.60	7.3	4.7	2.0	09.4	6.7
33	.947	.89	.84	.79	.73	.68	.63	.57	.52	6.8	3.6	30.4	7.2	4.0
34	.938	.88	.81	.75	.69	.63	.56	.50	.44	6.3	2.5	28.8	5.1	81.3
84 35	2.929	5.86	8.79	11.71	14.64	17.57	20.50	23.43	26.36	175.7	351.4	527.2	702.9	878.6
36	.920	.84	.76	.68	.60	.52	.44	.36	.28	5.2	50.4	5.7	700.8	6.0
37	.911	.82	.73	.65	.56	.47	.38	.29	.20	4.7	49.3	4.0	698.6	3.3
38	.902	.81	.71	.61	.51	.41	.32	.22	.12	4.1	8.2	2.3	6.5	70.6
39	.893	.79	.68	.57	.47	.36	.26	.15	6.04	3.6	7.1	20.7	4.3	67.9
84 40	2.884	5.77	8.65	11.54	14.42	17.30	20.19	23.07	25.96	173.0	346.1	519.1	692.1	865.2
41	.875	.75	.62	.50	.38	.25	.13	3.00	.88	2.5	5.0	7.5	90.0	62.5
42	.866	.73	.60	.46	.33	.20	.06	2.93	.79	2.0	3.9	5.9	87.8	59.8
43	.857	.71	.57	.43	.29	.14	20.00	.86	.71	1.4	2.8	4.3	5.7	7.1
44	.848	.70	.54	.39	.24	.09	19.94	.78	.63	0.9	1.8	2.6	3.5	4.4
84 45	2.839	5.68	8.52	11.36	14.20	17.03	19.87	22.71	25.55	170.3	340.7	511.0	681.4	851.7
46	.830	.66	.49	.32	.15	6.98	.81	.64	.47	69.8	39.6	09.4	79.2	49.0
47	.821	.64	.46	.28	.11	.93	.75	.57	.39	9.3	8.5	7.8	7.0	6.3
48	.812	.62	.44	.25	.06	.87	.68	.50	.31	8.7	7.4	6.2	4.9	3.6
49	.803	.61	.41	.21	4.02	.82	.62	.42	.23	8.2	6.4	4.5	2.7	40.9
84 50	2.794	5.59	8.38	11.18	13.97	16.76	19.56	22.35	25.15	167.6	335.3	502.9	670.6	838.2
51	.785	.57	.35	.14	.93	.71	.50	.28	5.07	7.1	4.2	501.3	68.4	5.5
52	.776	.55	.33	.10	.88	.66	.43	.21	4.98	6.6	3.1	499.7	6.3	2.8
53	.767	.53	.30	.07	.84	.60	.37	.14	.90	6.0	2.0	8.1	4.1	30.1
54	.758	.52	.27	.03	.79	.55	.31	2.06	.82	5.5	31.0	6.5	61.9	27.4
84 55	2.749	5.50	8.25	11.00	13.75	16.49	19.24	21.99	24.74	164.9	329.9	494.8	659.8	824.7
56	.740	.48	.22	0.96	.70	.44	.18	.92	.66	4.4	8.8	3.2	7.6	22.0
57	.731	.46	.19	.92	.66	.39	.12	.85	.58	3.9	7.7	1.6	5.5	19.3
58	.722	.44	.17	.89	.61	.33	9.05	.78	.50	3.3	6.7	90.0	3.3	6.6
59	.713	.43	.14	.85	.57	.28	8.99	.70	.42	2.8	5.6	88.4	51.2	3.9
84 60	2.704	5.41	8.11	10.82	13.52	16.22	18.93	21.63	24.34	162.2	324.5	486.7	649.0	811.2

Lat.		Latitude 84° to 85°—Meridional arcs.						Latitude 84°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 84° 30′		Value of 1′	Continuous sums of minutes from latitude 84° 00′		Longitude.	X	Y
°	′	*Meters.*	″	*Meters.*	*Meters.*	′	*Meters.*	° ′	*Meters.*	*Meters.*
84	00	31.024			1861.45					
	1	4	1	31.02	.45	1	1 861.4	0 1	194.6	0.0
	2	4	2	62.05	.45	2	3 722.9	2	389.2	0.1
	3	4	3	93.07	.45	3	5 584.4	3	583.8	0.3
	4	4	4	124.10	.45	4	7 445.8	4	778.3	0.5
84	05	31.024	5	155.12	1861.45	5	9 307.3	0 5	972.9	0.7
	6	4	6	186.15	.45	6	11 168.7	6	1 167.5	1.0
	7	4	7	217.17	.46	7	13 030.2	7	1 362.1	1.4
	8	4	8	248.20	.46	8	14 891.6	8	1 556.7	1.8
	9	4	9	279.22	.46	9	16 753.1	9	1 751.3	2.3
84	10	31.024	10	310.25	1861.46	10	18 614.5	0 10	1 945.9	2.8
	11	4	1	341.27	.46	1	20 476.0	15	2 918.8	6.3
	12	4	2	372.30	.46	2	22 337.5	20	3 891.8	11.3
	13	4	3	403.32	.46	3	24 198.9	25	4 864.7	17.6
	14	4	4	434.35	.46	4	26 060.4	30	5 837.6	25.3
84	15	31.024	15	465.37	1861.46	15	27 921.9	0 35	6 810.5	34.5
	16	4	6	496.39	.47	6	29 783.3	40	7 783.4	45.0
	17	4	7	527.42	.47	7	31 644.8	45	8 756.2	57.0
	18	4	8	558.44	.47	8	33 506.3	50	9 729.1	70.4
	19	4	9	589.47	.47	9	35 367.7	55	10 701.9	85.1
84	20	31.025	20	620.49	1861.47	20	37 229.2	1 00	11 674.7	101.3
	21	5	1	651.52	.47	1	39 090.7	05	12 647.5	118.9
	22	5	2	682.54	.47	2	40 952.1	10	13 620.3	137.9
	23	5	3	713.57	.47	3	42 813.6	15	14 593.0	158.3
	24	5	4	744.59	.47	4	44 675.1	20	15 565.7	180.1
84	25	31.025	25	775.62	1861.48	25	46 536.6	1 25	16 538.4	203.3
	26	5	6	806.64	.48	6	48 398.0	30	17 511.0	228.0
	27	5	7	837.67	.48	7	50 259.5	35	18 483.6	254.0
	28	5	8	868.69	.48	8	52 121.0	40	19 456.2	281.5
	29	5	9	899.72	.48	9	53 982.5	45	20 428.7	310.3
84	30	31.025	30	930.74	1861.48	30	55 844.0	1 50	21 401.2	340.6
	31	5	1	961.77	.48	1	57 705.4	55	22 373.6	372.2
	32	5	2	992.79	.48	2	59 566.9	2 00	23 346	405
	33	5	3	1 023.81	.48	3	61 428.4	3 00	35 010	912
	34	5	4	1 054.84	.49	4	63 289.9	4 00	46 664	1 621
84	35	31.025	35	1 085.86	1861.49	35	65 151.4	5 00	58 303	2 532
	36	5	6	1 116.89	.49	6	67 012.9	6 00	69 925	3 644
	37	5	7	1 147.91	.49	7	68 874.4	7 00	81 526	4 959
	38	5	8	1 178.94	.49	8	70 735.9	8 00	93 103	6 475
	39	5	9	1 209.96	.49	9	72 597.3	9 00	104 651	8 191
84	40	31.025	40	1 240.99	1861.49	40	74 458.8	10 00	116 168	10 107
	41	5	1	1 272.01	.49	1	76 320.3	11 00	127 650	12 223
	42	5	2	1 303.04	.49	2	78 181.8	12 00	139 093	14 539
	43	5	3	1 334.06	.49	3	80 043.3	13 00	150 494	17 052
	44	5	4	1 365.09	.50	4	81 904.8	14 00	161 851	19 763
84	45	31.025	45	1 396.11	1861.50	45	83 766.3	15 00	173 158	22 670
	46	5	6	1 427.14	.50	6	85 627.8	16 00	184 413	25 774
	47	5	7	1 458.16	.50	7	87 489.3	17 00	195 613	29 072
	48	5	8	1 489.18	.50	8	89 350.8	18 00	206 753	32 564
	49	5	9	1 520.21	.50	9	91 212.3	19 00	217 832	36 249
84	50	31.025	50	1 551.23	1861.50	50	93 073.8	20 00	228 845	40 126
	51	5	1	1 582.26	.50	1	94 935.3	21 00	239 788	44 193
	52	5	2	1 613.28	.50	2	96 796.8	22 00	250 660	48 450
	53	5	3	1 644.31	.50	3	98 658.3	23 00	261 456	52 894
	54	5	4	1 675.33	.51	4	100 519.8	24 00	272 173	57 526
84	55	31.025	55	1 706.36	1861.51	55	102 381.3	25 00	282 809	62 343
	56	5	6	1 737.38	.51	6	104 242.8	26 00	293 359	67 343
	57	5	7	1 768.41	.51	7	106 104.3	27 00	303 820	72 526
	58	5	8	1 799.43	.51	8	107 965.9	28 00	314 190	77 890
	59	5	9	1 830.46	.51	9	109 827.4	29 00	324 466	83 433
84	60	31.025	60	1 861.48	1861.51	60	111 688.9	30 00	334 644	89 153

Latitude 85° to 86°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
85 00	2.704	5.41	8.11	10.82	13.52	16.22	18.93	21.63	24.34	162.2	324.5	486.7	649.0	811.2
1	.695	.39	.09	.78	.48	.17	.87	.56	.26	1.7	3.4	5.1	6.8	08.6
2	.686	.37	.06	.75	.43	.12	.80	.49	.18	1.2	2.3	3.5	4.7	5.9
3	.677	.35	.03	.71	.39	.06	.74	.42	.10	0.6	1.3	1.9	2.5	3.2
4	.668	.34	8.00	.67	.34	6.01	.68	.35	4.02	60.1	20.2	80.3	40.4	800.5
85 05	2.659	5.32	7.98	10.64	13.30	15.96	18.62	21.27	23.93	159.6	319.1	478.7	638.2	797.8
6	.650	.30	.95	.60	.25	.90	.55	.20	.85	9.0	8.0	7.0	6.1	5.1
7	.641	.28	.92	.57	.21	.85	.49	.13	.77	8.5	7.0	5.4	3.9	92.4
8	.632	.26	.90	.53	.16	.79	.43	1.06	.69	7.9	5.9	3.8	31.7	89.7
9	.623	.25	.87	.49	.12	.74	.36	0.99	.61	7.4	4.8	2.2	29.6	7.0
85 10	2.614	5.23	7.84	10.46	13.07	15.69	18.30	20.91	23.53	156.9	313.7	470.6	627.4	784.3
11	.605	.21	.82	.42	3.03	.63	.24	.84	.45	6.3	2.6	68.9	5.3	81.6
12	.596	.19	.79	.39	2.98	.58	.17	.77	.37	5.8	1.6	7.3	3.1	78.9
13	.587	.17	.76	.35	.94	.52	.11	.70	.29	5.2	10.5	5.7	20.9	6.2
14	.578	.16	.73	.31	.89	.47	8.05	.63	.21	4.7	09.4	4.1	18.8	3.5
85 15	2.569	5.14	7.71	10.28	12.85	15.42	17.99	20.55	23.12	154.2	308.3	462.5	616.6	770.8
16	.560	.12	.68	.24	.80	.36	.92	.48	3.04	3.6	7.2	60.9	4.5	68.1
17	.551	.10	.65	.21	.76	.31	.86	.41	2.96	3.1	6.2	59.2	2.3	5.4
18	.542	.08	.63	.17	.71	.25	.80	.34	.88	2.5	5.1	7.6	10.2	2.7
19	.533	.07	.60	.13	.67	.20	.73	.27	.80	2.0	4.0	6.0	08.0	60.0
85 20	2.524	5.05	7.57	10.10	12.62	15.15	17.67	20.19	22.72	151.5	302.9	454.4	605.8	757.3
21	.515	.03	.55	.06	.58	.09	.61	.12	.64	0.9	1.8	2.8	3.7	4.6
22	.506	5.01	.52	10.03	.53	5.04	.54	20.05	.56	50.4	300.8	51.1	601.5	51.9
23	.497	4.99	.49	9.99	.49	4.98	.48	19.98	.48	49.8	299.7	49.5	599.4	49.2
24	.488	.98	.46	.95	.44	.93	.42	.91	.40	9.3	8.6	7.9	7.2	6.5
85 25	2.479	4.96	7.44	9.92	12.40	14.88	17.36	19.83	22.31	148.8	297.5	446.3	595.0	743.8
26	.470	.94	.41	.88	.35	.82	.29	.76	.23	8.2	6.4	4.7	2.9	41.1
27	.461	.92	.38	.85	.31	.77	.23	.69	.15	7.7	5.4	3.0	90.7	38.4
28	.452	.90	.36	.81	.26	.71	.17	.62	2.07	7.1	4.3	41.4	88.6	5.7
29	.443	.89	.33	.77	.22	.66	.10	.55	1.99	6.6	3.2	39.8	6.4	3.0
85 30	2.434	4.87	7.30	9.74	12.17	14.61	17.04	19.47	21.91	146.1	292.1	438.2	584.2	730.3
31	.425	.85	.28	.70	.13	.55	6.98	.40	.83	5.5	1.0	6.6	82.1	27.6
32	.416	.83	.25	.67	.08	.50	.91	.33	.75	5.0	90.0	4.9	79.9	4.9
33	.407	.81	.22	.63	2.04	.44	.85	.26	.67	4.4	88.9	3.3	7.8	22.2
34	.398	.80	.19	.59	1.99	.39	.79	.19	.59	3.9	7.8	1.7	5.6	19.5
85 35	2.389	4.78	7.17	9.56	11.95	14.34	16.73	19.11	21.50	143.4	286.7	430.1	573.4	716.8
36	.380	.76	.14	.52	.90	.28	.66	9.04	.42	2.8	5.6	28.5	71.3	4.1
37	.371	.74	.11	.49	.86	.23	.60	8.97	.34	2.3	4.6	6.8	69.1	11.4
38	.362	.72	.09	.45	.81	.17	.54	.90	.26	1.7	3.5	5.2	7.0	08.7
39	.353	.71	.06	.41	.77	.12	.47	.83	.18	1.2	2.4	3.6	4.8	6.0
85 40	2.344	4.69	7.03	9.38	11.72	14.07	16.41	18.75	21.10	140.7	281.3	422.0	562.6	703.3
41	.335	.67	7.01	.34	.68	4.01	.35	.68	1.02	40.1	80.2	20.4	60.5	700.6
42	.326	.65	6.98	.31	.63	3.96	.28	.61	0.94	39.6	79.2	18.7	58.3	697.9
43	.317	.63	.95	.27	.59	.90	.22	.54	.86	9.0	8.1	7.1	6.2	5.2
44	.308	.62	.92	.23	.54	.85	.16	.47	.78	8.5	7.0	5.5	4.0	92.5
85 45	2.299	4.60	6.90	9.20	11.50	13.80	16.10	18.39	20.69	138.0	275.9	413.9	551.8	689.8
46	.290	.58	.87	.16	.45	.74	6.03	.32	.61	7.4	4.8	2.3	49.7	7.1
47	.281	.56	.84	.13	.41	.69	5.97	.25	.53	6.9	3.8	10.6	7.5	4.4
48	.272	.54	.82	.09	.36	.63	.91	.18	.45	6.3	2.7	09.0	5.4	81.7
49	.263	.53	.79	.05	.32	.58	.84	.11	.37	5.8	1.6	7.4	3.2	79.0
85 50	2.254	4.51	6.76	9.02	11.27	13.53	15.78	18.03	20.29	135.3	270.5	405.8	541.0	676.3
51	.245	.49	.74	8.98	.23	.47	.72	7.96	.21	4.7	69.4	4.2	38.9	3.6
52	.236	.47	.71	.95	.18	.42	.65	.89	.13	4.2	8.4	2.5	6.7	70.9
53	.227	.45	.68	.91	.14	.36	.59	.82	20.05	3.6	7.3	400.9	4.6	68.2
54	.218	.44	.65	.87	.09	.31	.53	.75	19.97	3.1	6.2	399.3	2.4	5.5
85 55	2.209	4.42	6.63	8.84	11.05	13.26	15.46	17.67	19.88	132.6	265.1	397.7	530.2	662.8
56	.200	.40	.60	.80	1.00	.20	.40	.60	.80	2.0	4.0	6.1	28.1	60.1
57	.191	.38	.57	.77	0.96	.15	.34	.53	.72	1.5	3.0	4.4	5.9	57.4
58	.182	.36	.55	.73	.91	.09	.28	.46	.64	0.9	1.9	2.8	3.8	4.7
59	.173	.35	.52	.69	.87	3.04	.21	.39	.56	30.4	60.8	91.2	21.6	52.0
85 60	2.164	4.33	6.49	8.66	10.82	12.99	15.15	17.31	19.48	129.9	259.7	389.6	519.4	649.3

Lat.		Latitude 85° to 86°—Meridional arcs.						Latitude 85°—Co-ordinates of curvature.		
		Value of 1′	Sums of seconds for middle latitude 85° 30′		Value of 1′	Continuous sums of minutes from latitude 85° 00′		Longitude.	X	Y
°	′	Meters.	″	Meters.	Meters.	′	Meters.	° ′	Meters.	Meters.
85	00	31.025			1861.51					
	1	5	1	31.03	.51	1	1 861.5	0 1	162.2	0.0
	2	5	2	62.05	.51	2	3 723.0	2	324.5	0.1
	3	5	3	93.08	.51	3	5 584.5	3	486.7	0.2
	4	5	4	124.10	.51	4	7 446.0	4	649.0	0.4
85	05	31.025	5	155.13	1861.52	5	9 307.6	0 5	811.2	0.6
	6	5	6	186.15	.52	6	11 169.1	6	973.5	0.8
	7	5	7	217.18	.52	7	13 030.6	7	1 135.7	1.1
	8	5	8	248.21	.52	8	14 892.1	8	1 298.0	1.5
	9	5	9	279.23	.52	9	16 753.6	9	1 460.2	1.9
85	10	31.025	10	310.26	1861.52	10	18 615.2	0 10	1 622.5	2.3
	11	5	1	341.28	.52	1	20 476.7	15	2 433.7	5.3
	12	5	2	372.31	.52	2	22 338.2	20	3 245.0	9.4
	13	5	3	403.33	.52	3	24 199.7	25	4 056.2	14.7
	14	5	4	434.36	.52	4	26 061.2	30	4 867.4	21.2
85	15	31.025	15	465.38	1861.53	15	27 922.8	0 35	5 678.6	28.8
	16	5	6	496.41	.53	6	29 784.3	40	6 489.8	37.6
	17	5	7	527.44	.53	7	31 645.8	45	7 301.0	47.6
	18	5	8	558.46	.53	8	33 507.3	50	8 112.2	58.8
	19	5	9	589.49	.53	9	35 368.9	55	8 923.3	71.1
85	20	31.025	20	620.51	1861.53	20	37 230.4	1 00	9 734.5	84.6
	21	6	1	651.54	.53	1	39 091.9	05	10 545.6	99.3
	22	6	2	682.56	.53	2	40 953.5	10	11 356.7	115.2
	23	6	3	713.59	.53	3	42 815.0	15	12 167.8	132.2
	24	6	4	744.62	.53	4	44 676.5	20	12 978.8	150.4
85	25	31.026	25	775.64	1861.53	25	46 538.1	1 25	13 789.8	169.8
	26	6	6	806.67	.54	6	48 399.6	30	14 600.8	190.4
	27	6	7	837.69	.54	7	50 261.1	35	15 411.8	212.2
	28	6	8	868.72	.54	8	52 122.7	40	16 222.7	235.1
	29	6	9	899.74	.54	9	53 984.2	45	17 033.6	259.2
85	30	31.026	30	930.77	1861.54	30	55 845.7	1 50	17 844.5	284.4
	31	6	1	961.79	.54	1	57 707.3	55	18 655.3	310.9
	32	6	2	992.82	.54	2	59 568.8	2 00	19 466	338
	33	6	3	1 023.85	.54	3	61 430.4	3 00	29 192	762
	34	6	4	1 054.87	.54	4	63 291.9	4 00	38 909	1 354
85	35	31.026	35	1 085.90	1861.54	35	65 153.4	5 00	48 613	2 114
	36	6	6	1 116.92	.54	6	67 015.0	6 00	58 304	3 044
	37	6	7	1 147.95	.54	7	68 876.5	7 00	67 977	4 142
	38	6	8	1 178.97	.55	8	70 738.1	8 00	77 629	5 408
	39	6	9	1 210.00	.55	9	72 599.6	9 00	87 258	6 841
85	40	31.026	40	1 241.03	1861.55	40	74 461.2	10 00	96 860	8 442
	41	6	1	1 272.05	.55	1	76 322.7	11 00	106 433	10 209
	42	6	2	1 303.08	.55	2	78 184.3	12 00	115 974	12 143
	43	6	3	1 334.10	.55	3	80 045.8	13 00	125 480	14 242
	44	6	4	1 365.13	.55	4	81 907.4	14 00	134 948	16 506
85	45	31.026	45	1 396.15	1861.55	45	83 768.9	15 00	144 375	18 934
	46	6	6	1 427.18	.55	6	85 630.5	16 00	153 759	21 526
	47	6	7	1 458.21	.55	7	87 492.0	17 00	163 096	24 281
	48	6	8	1 489.23	.55	8	89 353.6	18 00	172 383	27 197
	49	6	9	1 520.26	.55	9	91 215.2	19 00	181 619	30 275
85	50	31.026	50	1 551.28	1861.56	50	93 076.7	20 00	190 800	33 512
	51	6	1	1 582.31	.56	1	94 938.3	21 00	199 922	36 909
	52	6	2	1 613.33	.56	2	96 799.8	22 00	208 985	40 464
	53	6	3	1 644.36	.56	3	98 661.4	23 00	217 985	44 176
	54	6	4	1 675.38	.56	4	100 522.9	24 00	226 918	48 044
85	55	31.026	55	1 706.41	1861.56	55	102 384.5	25 00	235 783	52 066
	56	6	6	1 737.44	.56	6	104 246.1	26 00	244 577	56 243
	57	6	7	1 768.46	.56	7	106 107.6	27 00	253 296	60 571
	58	6	8	1 799.49	.56	8	107 969.2	28 00	261 939	65 050
	59	6	9	1 830.51	.56	9	109 830.8	29 00	270 503	69 679
85	60	31.026	60	1 861.54	1861.56	60	111 692.3	30 00	278 986	74 456

Latitude 86° to 87°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
86 00	2.164	4.33	6.49	8.66	10.82	12.99	15.15	17.31	19.48	129.9	259.7	389.6	519.4	649.3
1	.155	.31	.47	.62	.78	.93	.09	.24	.40	9.3	8.6	8.0	7.3	6.6
2	.146	.29	.44	.59	.73	.88	5.02	.17	.32	8.8	7.6	6.3	5.1	3.9
3	.137	.27	.41	.55	.69	.82	4.96	.10	.24	8.2	6.5	4.7	3.0	41.2
4	.128	.26	.38	.51	.64	.77	.90	7.03	.16	7.7	5.4	3.1	10.8	38.5
86 05	2.119	4.24	6.36	8.48	10.60	12.72	14.83	16.95	19.07	127.2	254.3	381.5	508.6	635.8
6	.110	.22	.33	.44	.55	.66	.77	.88	8.99	6.6	3.2	79.9	6.5	3.1
7	.101	.20	.30	.41	.51	.61	.71	.81	.91	6.1	2.2	8.2	4.3	30.4
8	.092	.18	.28	.37	.46	.55	.65	.74	.83	5.5	1.1	6.6	2.2	27.7
9	.083	.17	.25	.33	.42	.50	.58	.67	.75	5.0	50.0	5.0	500.0	5.0
86 10	2.074	4.15	6.22	8.30	10.37	12.45	14.52	16.59	18.67	124.5	248.9	373.4	497.8	622.3
11	.065	.13	.20	.26	.33	.39	.46	.52	.59	3.9	7.8	1.8	5.7	19.6
12	.056	.11	.17	.23	.28	.34	.39	.45	.51	3.4	6.8	70.1	3.5	6.9
13	.047	.09	.14	.19	.24	.28	.33	.38	.43	2.8	5.7	68.5	91.3	4.2
14	.038	.08	.11	.15	.19	.23	.27	.31	.35	2.3	4.6	6.9	89.2	11.5
86 15	2.029	4.06	6.09	8.12	10.15	12.18	14.20	16.23	18.26	121.8	243.5	365.3	487.0	608.8
16	.020	.04	.06	.08	.10	.12	.14	.16	.18	1.2	2.4	3.6	4.9	6.1
17	.011	.02	.03	.05	.06	.07	.08	.09	.10	0.7	1.3	2.0	2.7	3.4
18	2.002	4.00	6.01	8.01	10.01	2.01	4.02	6.02	8.02	20.1	40.3	60.4	80.5	600.7
19	1.993	3.99	5.98	7.97	9.97	1.96	3.95	5.95	7.94	19.6	39.2	58.8	78.4	598.0
86 20	1.984	3.97	5.95	7.94	9.92	11.91	13.89	15.87	17.86	119.1	238.1	357.2	476.2	595.3
21	.975	.95	.93	.90	.88	.85	.83	.80	.78	8.5	7.0	5.5	4.0	92.6
22	.966	.93	.90	.87	.83	.80	.76	.73	.70	8.0	5.9	3.9	71.9	89.9
23	.957	.91	.87	.83	.79	.74	.70	.66	.62	7.4	4.9	2.3	69.7	7.2
24	.948	.90	.84	.79	.74	.69	.64	.59	.54	6.9	3.8	50.7	7.6	4.5
86 25	1.939	3.88	5.82	7.76	9.70	11.64	13.58	15.51	17.45	116.4	232.7	349.1	465.4	581.8
26	.930	.86	.79	.72	.65	.58	.51	.44	.37	5.8	1.6	7.4	3.2	79.0
27	.921	.84	.76	.68	.61	.53	.45	.37	.29	5.3	30.5	5.8	61.1	6.3
28	.912	.82	.74	.65	.56	.47	.38	.30	.21	4.7	29.5	4.2	58.9	3.6
29	.903	.81	.71	.61	.52	.42	.32	.22	.13	4.2	8.4	2.6	6.8	70.9
86 30	1.894	3.79	5.68	7.58	9.47	11.36	13.26	15.15	17.05	113.6	227.3	340.9	454.6	568.2
31	.885	.77	.65	.54	.43	.31	.20	.08	6.97	3.1	6.2	39.3	2.4	5.5
32	.876	.75	.63	.50	.38	.26	.13	5.01	.88	2.6	5.1	7.7	50.3	2.8
33	.867	.73	.60	.47	.34	.20	.07	4.94	.80	2.0	4.1	6.1	48.1	60.1
34	.858	.72	.57	.43	.29	.15	3.01	.86	.72	1.5	3.0	4.5	5.9	57.4
86 35	1.849	3.70	5.55	7.40	9.25	11.09	12.94	14.79	16.64	110.9	221.9	332.8	443.8	554.7
36	.840	.68	.52	.36	.20	1.04	.88	.72	.56	10.4	20.8	31.2	41.6	52.0
37	.831	.66	.49	.32	.16	0.99	.82	.65	.48	09.9	19.7	29.6	39.5	49.3
38	.822	.64	.47	.29	.11	.93	.75	.58	.40	9.3	8.6	8.0	7.3	6.6
39	.813	.63	.44	.25	.07	.88	.69	.50	.32	8.8	7.6	6.3	5.1	3.9
86 40	1.804	3.61	5.41	7.22	9.02	10.82	12.63	14.43	16.24	108.2	216.5	324.7	433.0	541.2
41	.795	.59	.38	.18	8.98	.77	.57	.36	.16	7.7	5.4	3.1	30.8	38.5
42	.786	.57	.36	.14	.93	.72	.50	.29	6.07	7.2	4.3	21.5	28.6	5.8
43	.777	.55	.33	.11	.89	.66	.44	.22	5.99	6.6	3.2	19.9	6.5	3.1
44	.768	.54	.30	.07	.84	.61	.38	.14	.92	6.1	2.2	8.2	4.3	30.4
86 45	1.759	3.52	5.28	7.04	8.80	10.55	12.31	14.07	15.83	105.5	211.1	316.6	422.2	527.7
46	.750	.50	.25	7.00	.75	.50	.25	4.00	.75	5.0	10.0	5.0	20.0	5.0
47	.741	.48	.22	6.96	.71	.45	.19	3.93	.67	4.5	08.9	3.4	17.8	22.3
48	.732	.46	.20	.93	.66	.39	.12	.86	.59	3.9	7.8	1.8	5.7	19.6
49	.723	.45	.17	.89	.62	.34	.06	.78	.51	3.4	6.8	10.1	3.5	6.9
86 50	1.714	3.43	5.14	6.86	8.57	10.28	12.00	13.71	15.43	102.8	205.7	308.5	411.3	514.2
51	.705	.41	.11	.82	.53	.23	1.94	.64	.35	2.3	4.6	6.9	09.2	11.5
52	.696	.39	.09	.78	.48	.18	.87	.57	.26	1.8	3.5	5.3	7.0	08.8
53	.687	.37	.06	.75	.44	.12	.81	.50	.18	1.2	2.4	3.6	4.9	6.1
54	.678	.36	.03	.71	.39	.07	.75	.42	.10	0.7	1.3	2.0	2.7	3.4
86 55	1.669	3.34	5.01	6.68	8.35	10.01	11.68	13.35	15.02	100.1	200.3	300.4	400.5	500.7
56	.660	.32	4.98	.64	.30	9.96	.62	.28	4.94	99.6	199.2	298.8	398.4	498.0
57	.651	.30	.95	.60	.26	.91	.56	.21	.86	9.1	8.1	7.2	6.2	5.3
58	.642	.28	.93	.57	.21	.85	.49	.14	.78	8.5	7.0	5.5	4.0	92.6
59	.633	.27	.90	.53	.17	.80	.43	3.06	.70	8.0	5.9	3.9	1.9	89.9
86 60	1.624	3.25	4.87	6.50	8.12	9.74	11.37	12.99	14.61	97.4	194.9	292.3	389.7	487.2

Lat.		Latitude 86° to 87°—Meridional arcs.						Latitude 86°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 86° 30′		Value of 1′	Continuous sums of minutes from latitude 86° 00′		Longitude.	X	Y
°	′	*Meters.*	″	*Meters.*	*Meters.*	′	*Meters.*	° ′	*Meters.*	*Meters.*
86	00	31.026			1861.56					
	1	6	1	31.03	.56	1	1 861.6	0 1	129.9	0.0
	2	6	2	62.05	.56	2	3 723.1	2	259.7	0.1
	3	6	3	93.08	.57	3	5 584.7	3	389.6	0.2
	4	6	4	124.11	.57	4	7 446.3	4	519.4	0.3
86	05	31.026	5	155.13	1861.57	5	9 307.8	0 5	649.3	0.5
	6	6	6	186.16	.57	6	11 169.4	6	779.2	0.7
	7	6	7	217.18	.57	7	13 031.0	7	909.0	0.9
	8	6	8	248.21	.57	8	14 892.5	8	1 038.9	1.2
	9	6	9	279.24	.57	9	16 754.1	9	1 168.7	1.5
86	10	31.026	10	310.26	1861.57	10	18 615.7	0 10	1 298.6	1.9
	11	6	1	341.29	.57	1	20 477.2	15	1 947.9	4.2
	12	6	2	372.32	.57	2	22 338.8	20	2 597.2	7.5
	13	6	3	403.34	.57	3	24 200.4	25	3 246.5	11.8
	14	6	4	434.37	.57	4	26 062.0	30	3 895.8	17.0
86	15	31.026	15	465.40	1861.57	15	27 923.5	0 35	4 545.0	23.1
	16	6	6	496.42	.58	6	29 785.1	40	5 194.3	30.1
	17	6	7	527.45	.58	7	31 646.7	45	5 843.6	38.1
	18	6	8	558.48	.58	8	33 508.3	50	6 492.8	47.1
	19	6	9	589.50	.58	9	35 369.8	55	7 142.0	57.0
86	20	31.026	20	620.53	1861.58	20	37 231.4	1 00	7 791.2	67.8
	21	6	1	651.55	.58	1	39 093.0	05	8 440.4	79.6
	22	6	2	682.58	.58	2	40 954.6	10	9 089.6	92.3
	23	6	3	713.61	.58	3	42 816.2	15	9 738.8	106.0
	24	6	4	744.63	.58	4	44 677.7	20	10 387.9	120.6
86	25	31.026	25	775.66	1861.58	25	46 539.3	1 25	11 037.0	136.1
	26	6	6	806.69	.58	6	48 400.9	30	11 686.1	152.6
	27	6	7	837.71	.58	7	50 262.5	35	12 335.2	170.0
	28	6	8	868.74	.58	8	52 124.1	40	12 984.2	188.4
	29	6	9	899.77	.58	9	53 985.7	45	13 633.2	207.7
86	30	31.026	30	930.79	1861.58	30	55 847.2	1 50	14 282.2	228.0
	31	6	1	961.82	.59	1	57 708.8	55	14 931.2	249.2
	32	6	2	992.85	.59	2	59 570.4	2 00	15 580	271
	33	6	3	1 023.87	.59	3	61 432.0	3 00	23 364	610
	34	6	4	1 054.90	.59	4	63 293.6	4 00	31 141	1 085
86	35	31.026	35	1 085.92	1861.59	35	65 155.2	5 00	38 909	1 695
	36	6	6	1 116.95	.59	6	67 016.8	6 00	46 665	2 440
	37	6	7	1 147.98	.59	7	68 878.3	7 00	54 406	3 320
	38	6	8	1 179.00	.59	8	70 739.9	8 00	62 132	4 334
	39	6	9	1 210.03	.59	9	72 601.5	9 00	69 838	5 483
86	40	31.027	40	1 241.06	1861.59	40	74 463.1	10 00	77 523	6 766
	41	7	1	1 272.08	.59	1	76 324.7	11 00	85 185	8 182
	42	7	2	1 303.11	.59	2	78 186.3	12 00	92 821	9 732
	43	7	3	1 334.14	.59	3	80 047.9	13 00	100 428	11 414
	44	7	4	1 365.16	.59	4	81 909.5	14 00	108 006	13 229
86	45	31.027	45	1 396.19	1861.59	45	83 771.1	15 00	115 550	15 175
	46	7	6	1 427.21	.60	6	85 632.7	16 00	123 060	17 252
	47	7	7	1 458.24	.60	7	87 494.3	17 00	130 532	19 460
	48	7	8	1 489.27	.60	8	89 355.9	18 00	137 965	21 797
	49	7	9	1 520.29	.60	9	91 217.5	19 00	145 356	24 264
86	50	31.027	50	1 551.32	1861.60	50	93 079.1	20 00	152 702	26 859
	51	7	1	1 582.35	.60	1	94 940.7	21 00	160 003	29 581
	52	7	2	1 613.37	.60	2	96 802.3	22 00	167 255	32 430
	53	7	3	1 644.40	.60	3	98 663.9	23 00	174 456	35 405
	54	7	4	1 675.43	.60	4	100 525.5	24 00	181 604	38 504
86	55	31.027	55	1 706.45	1861.60	55	102 387.1	25 00	188 698	41 728
	56	7	6	1 737.48	.60	6	104 248.7	26 00	195 734	45 075
	57	7	7	1 768.51	.60	7	106 110.3	27 00	202 711	48 543
	58	7	8	1 799.53	.60	8	107 971.9	28 00	209 626	52 133
	59	7	9	1 830.56	.60	9	109 833.5	29 00	216 478	55 843
86	60	31.027	60	1 861.58	1861.60	60	111 695.1	30 00	223 264	59 671

Latitude 87° to 88°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
87 00	1.624	3.25	4.87	6.50	8.12	9.74	11.37	12.99	14.61	97.4	194.9	292.3	389.7	487.2
1	.615	.23	.84	.46	.08	.69	.31	.92	.53	6.9	3.8	90.7	7.6	4.5
2	.606	.21	.82	.42	8.03	.63	.24	.85	.45	6.3	2.7	89.0	5.4	81.7
3	.597	.19	.79	.39	7.98	.58	.18	.77	.37	5.8	1.6	7.4	3.2	79.0
4	.588	.18	.76	.35	.94	.53	.11	.70	.29	5.3	90.5	5.8	81.1	6.3
87 05	1.579	3.16	4.74	6.31	7.89	9.47	11.05	12.63	14.21	94.7	189.5	284.2	378.9	473.6
6	.570	.14	.71	.28	.85	.42	0.99	.56	.13	4.2	8.4	2.6	6.7	70.9
7	.561	.12	.68	.24	.80	.36	.92	.49	4.05	3.6	7.3	80.9	4.6	68.2
8	.552	.10	.65	.21	76	.31	.86	.41	3.96	3.1	6.2	79.3	2.4	5.5
9	.543	.09	.63	.17	.71	.26	.80	.34	.88	2.6	5.1	7.7	70.3	2.8
87 10	1.534	3.07	4.60	6.13	7.67	9.20	10.74	12.27	13.80	92.0	184.0	276.1	368.1	460.1
11	.525	.05	.57	.10	.62	.15	.67	.20	.72	1.5	3.0	4.4	5.9	57.4
12	.516	.03	.55	.06	.58	.09	.61	.13	.64	0.9	1.9	2.8	3.8	4.7
13	.507	.01	.52	6.03	.53	9.04	.55	2.05	.56	90.4	80.8	71.2	61.6	52.0
14	.498	3.00	.49	5.99	.49	8.99	.48	1.98	.48	89.9	79.7	69.6	59.4	49.3
87 15	1.489	2.98	4.47	5.95	7.44	8.93	10.42	11.91	13.40	89.3	178.6	268.0	357.3	446.6
16	.480	.96	.44	.92	.40	.88	.36	.84	.32	8.8	7.6	6.3	5.1	3.9
17	.471	.94	.41	.88	.35	.82	.29	.77	.24	8.2	6.5	4.7	3.0	41.2
18	.462	.92	.38	.85	.31	.77	.23	.69	.15	7.7	5.4	3.1	50.8	38.5
19	.453	.91	.36	.81	.26	.72	.17	.62	3.07	7.2	4.3	61.5	48.6	5.8
87 20	1.444	2.89	4.33	5.77	7.22	8.66	10.11	11.55	12.99	86.6	173.2	259.8	346.5	433.1
21	.435	.87	.30	.74	.17	.61	10.04	.48	.91	6.1	2.1	8.2	4.3	30.4
22	.426	.85	.28	.70	.13	.55	9.98	.41	.83	5.5	1.1	6.6	2.1	27.7
23	.417	.83	.25	.67	.08	.50	.92	.33	.75	5.0	70.0	5.0	40.0	5.0
24	.408	.82	.22	.63	7.04	.45	.85	.26	.67	4.5	68.9	3.4	37.8	22.3
87 25	1.399	2.80	4.20	5.59	6.99	8.39	9.79	11.19	12.59	83.9	167.8	251.7	335.6	419.6
26	.389	.78	.17	.56	.95	.34	.73	.12	.50	3.4	6.7	50.1	3.5	6.8
27	.380	.76	.14	.52	.90	.28	.66	1.05	.42	2.8	5.7	48.5	31.3	4.1
28	.371	.74	.11	.49	.86	.23	.60	0.97	.34	2.3	4.6	6.9	29.2	11.4
29	.362	.72	.09	.45	.81	.17	.54	.90	.26	1.7	3.5	5.2	7.0	08.7
87 30	1.353	2.71	4.06	5.41	6.77	8.12	9.47	10.83	12.18	81.2	162.4	243.6	324.8	406.0
31	.344	.69	.03	.38	.72	.07	.41	.76	.10	0.7	1.3	2.0	2.7	3.3
32	.335	.67	4.01	.34	.68	8.01	.35	.69	2.02	80.1	60.2	40.4	20.5	400.6
33	.326	.65	3.98	.31	.63	7.96	.28	.61	1.94	79.6	59.2	38.7	18.3	397.9
34	.317	.63	.95	.27	.58	.90	.22	.54	.86	9.0	8.1	7.1	6.2	5.2
87 35	1.308	2.62	3.93	5.23	6.54	7.85	9.16	10.47	11.77	78.5	157.0	235.5	314.0	392.5
36	.299	.60	.90	.20	.50	.80	.10	.40	.69	8.0	5.9	3.9	11.8	89.8
37	.290	.58	.87	.16	.45	.74	9.03	.33	.61	7.4	4.8	2.3	09.7	7.1
38	.281	.56	.84	.13	.41	.69	8.97	.25	.53	6.9	3.8	30.6	7.5	4.4
39	.272	.54	.82	.09	.36	.63	.91	.18	.45	6.3	2.7	29.0	5.3	81.7
87 40	1.263	2.53	3.79	5.05	6.32	7.58	8.84	10.11	11.37	75.8	151.6	227.4	303.2	379.0
41	.254	.51	.76	5.02	.27	.53	.78	10.03	.29	5.3	50.5	5.8	301.0	6.3
42	.245	.49	.74	4.98	.23	.47	.72	9.96	.21	4.7	49.4	4.1	298.8	3.6
43	.236	.47	.71	.95	.18	.42	.65	.89	.13	4.2	8.3	2.5	6.7	70.9
44	.227	.45	.68	.91	.14	.36	.59	.82	1.05	3.6	7.3	20.9	4.5	68.1
87 45	1.218	2.44	3.65	4.87	6.09	7.31	8.53	9.74	10.96	73.1	146.2	219.3	292.4	365.4
46	.209	.42	.63	.84	.05	.26	.46	.67	.88	2.6	5.1	7.6	90.2	2.7
47	.200	.40	.60	.80	6.00	.20	.40	.60	.80	2.0	4.0	6.0	88.0	60.0
48	.191	.38	.57	.76	5.96	.15	.34	.53	.72	1.5	2.9	4.4	5.9	57.3
49	.182	.36	.55	.73	.91	.09	.27	.46	.64	0.9	1.8	2.8	3.7	4.6
87 50	1.173	2.35	3.52	4.69	5.87	7.04	8.21	9.38	10.56	70.4	140.8	211.1	281.5	351.9
51	.164	.33	.49	.66	.82	6.98	.15	.31	.48	69.8	39.7	09.5	79.4	49.2
52	.155	.31	.47	.62	.78	.93	.08	.24	.39	9.3	8.6	7.9	7.2	6.5
53	.146	.29	.44	.58	.73	.88	8.02	.17	.31	8.8	7.5	6.3	5.0	3.8
54	.137	.27	.41	.55	.69	.82	7.96	.10	.23	8.2	6.4	4.7	2.9	41.1
87 55	1.128	2.26	3.38	4.51	5.64	6.77	7.90	9.02	10.15	67.7	135.4	203.0	270.7	338.4
56	.119	.24	.36	.48	.60	.71	.83	8.95	10.07	7.1	4.3	201.4	68.5	5.7
57	.110	.22	.33	.44	.55	.66	.77	.88	9.99	6.6	3.2	199.8	6.4	3.0
58	.101	.20	.30	.40	.50	.61	.71	.81	.91	6.1	2.1	8.2	4.2	30.3
59	.092	.18	.28	.37	.46	.55	.64	.74	.83	5.5	31.0	6.5	62.0	27.6
87 60	1.083	2.17	3.25	4.33	5.41	6.50	7.58	8.66	9.75	65.0	129.9	194.9	259.9	324.9

Lat.		Latitude 87° to 88°—Meridional arcs.						Latitude 87°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 87° 30′		Value of 1′	Continuous sums of minutes from latitude 87° 00′		Longitude.	X	Y
°	′	Meters.	″	Meters.	Meters.	′	Meters.	° ′	Meters.	Meters.
87	00	31.027			1861.60					
	1	7	1	31.03	.60	1	1 861.6	0 1	97.4	0.0
	2	7	2	62.05	.60	2	3 723.2	2	194.9	0.1
	3	7	3	93.08	.61	3	5 584.8	3	292.3	0.1
	4	7	4	124.11	.61	4	7 446.4	4	389.7	0.2
87	05	31.027	5	155.13	1861.61	5	9 308.0	0 5	487.2	0.4
	6	7	6	186.16	.61	6	11 169.6	6	584.6	0.5
	7	7	7	217.19	.61	7	13 031.2	7	682.0	0.7
	8	7	8	248.22	.61	8	14 892.9	8	779.5	0.9
	9	7	9	279.24	.61	9	16 754.5	9	876.9	1.1
87	10	31.027	10	310.27	1861.61	10	18 616.1	0 10	974.3	1.4
	11	7	1	341.30	.61	1	20 477.7	15	1 461.5	3.2
	12	7	2	372.32	.61	2	22 339.3	20	1 948.6	5.7
	13	7	3	403.35	.61	3	24 200.9	25	2 435.7	8.8
	14	7	4	434.38	.61	4	26 062.5	30	2 922.9	12.7
87	15	31.027	15	465.40	1861.61	15	27 924.1	0 35	3 410.0	17.3
	16	7	6	496.43	.61	6	29 785.7	40	3 897.1	22.7
	17	7	7	527.46	.61	7	31 647.4	45	4 384.3	28.7
	18	7	8	558.49	.61	8	33 509.0	50	4 871.4	35.4
	19	7	9	589.51	.61	9	35 370.6	55	5 358.5	42.8
87	20	31.027	20	620.54	1861.61	20	37 232.2	1 00	5 845.5	50.9
	21	7	1	651.57	.62	1	39 093.8	05	6 332.6	59.8
	22	7	2	682.59	.62	2	40 955.4	10	6 819.7	69.3
	23	7	3	713.62	.62	3	42 817.0	15	7 306.7	79.6
	24	7	4	744.65	.62	4	44 678.7	20	7 793.7	90.6
87	25	31.027	25	775.67	1861.62	25	46 540.3	1 25	8 280.8	102.2
	26	7	6	806.70	.62	6	48 401.9	30	8 767.8	114.6
	27	7	7	837.73	.62	7	50 263.5	35	9 254.7	127.7
	28	7	8	868.76	.62	8	52 125.1	40	9 741.7	141.5
	29	7	9	899.78	.62	9	53 986.8	45	10 228.6	156.0
87	30	31.027	30	930.81	1861.62	30	55 848.4	1 50	10 715.5	171.2
	31	7	1	961.84	.62	1	57 710.0	55	11 202.4	187.1
	32	7	2	992.86	.62	2	59 571.6	2 00	11 689	204
	33	7	3	1 023.89	.62	3	61 433.2	3 00	17 529	459
	34	7	4	1 054.92	.62	4	63 294.8	4 00	23 364	815
87	35	31.027	35	1 085.94	1861.62	35	65 156.5	5 00	29 192	1 273
	36	7	6	1 116.97	.62	6	67 018.1	6 00	35 011	1 832
	37	7	7	1 148.00	.62	7	68 879.7	7 00	40 819	2 493
	38	7	8	1 179.03	.62	8	70 741.3	8 00	46 615	3 255
	39	7	9	1 210.05	.62	9	72 603.0	9 00	52 397	4 118
87	40	31.027	40	1 241.08	1861.62	40	74 464.6	10 00	58 163	5 082
	41	7	1	1 272.11	.62	1	76 326.2	11 00	63 911	6 145
	42	7	2	1 303.13	.63	2	78 187.8	12 00	69 640	7 309
	43	7	3	1 334.16	.63	3	80 049.5	13 00	75 347	8 573
	44	7	4	1 365.19	.63	4	81 911.1	14 00	81 032	9 936
87	45	31.027	45	1 396.21	1861.63	45	83 772.7	15 00	86 692	11 397
	46	7	6	1 427.24	.63	6	85 634.3	16 00	92 326	12 958
	47	7	7	1 458.27	.63	7	87 496.0	17 00	97 932	14 616
	48	7	8	1 489.30	.63	8	89 357.6	18 00	103 507	16 371
	49	7	9	1 520.32	.63	9	91 219.2	19 00	109 052	18 223
87	50	31.027	50	1 551.35	1861.63	50	93 080.9	20 00	114 563	20 172
	51	7	1	1 582.38	.63	1	94 942.5	21 00	120 040	22 217
	52	7	2	1 613.40	.63	2	96 804.1	22 00	125 480	24 357
	53	7	3	1 644.43	.63	3	98 665.7	23 00	130 882	26 591
	54	7	4	1 675.46	.63	4	100 527.4	24 00	136 244	28 919
87	55	31.027	55	1 706.48	1861.63	55	102 389.0	25 00	141 565	31 340
	56	7	6	1 737.51	.63	6	104 250.6	26 00	146 843	33 853
	57	7	7	1 768.54	.63	7	106 112.3	27 00	152 076	36 458
	58	7	8	1 799.57	.63	8	107 973.9	28 00	157 263	39 154
	59	7	9	1 830.59	.63	9	109 835.5	29 00	162 402	41 940
87	60	31.027	60	1 861.62	1861.63	60	111 697.2	30 00	167 492	44 815

Latitude 88° to 89°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
88 00	1.083	2.17	3.25	4.33	5.41	6.50	7.58	8.66	9.75	65.0	129.9	194.9	259.9	324.9
1	.074	.15	.22	.29	.37	.44	.52	.59	.66	4.4	8.9	3.3	7.7	22.1
2	.065	.13	.19	.26	.32	.39	.45	.52	.58	3.9	7.8	1.7	5.5	19.4
3	.056	.11	.17	.22	.28	.33	.39	.45	.50	3.3	6.7	90.0	3.4	6.7
4	.047	.09	.14	.19	.23	.28	.33	.37	.42	2.8	5.6	88.4	51.2	4.0
88 05	1.038	2.08	3.11	4.15	5.19	6.23	7.26	8.30	9.34	62.3	124.5	186.8	249.1	311.3
6	.029	.06	.09	.11	.14	.17	.20	.23	.26	1.7	3.4	5.2	6.9	08.6
7	.020	.04	.06	.08	.10	.12	.14	.16	.18	1.2	2.4	3.5	4.7	5.9
8	.011	.02	.03	.04	.05	.06	.07	.09	.10	0.6	1.3	1.9	2.6	3.2
9	1.002	2.00	3.01	4.01	5.01	6.01	7.01	8.01	9.01	60.1	20.2	80.3	40.4	300.5
88 10	0.993	1.99	2.98	3.97	4.96	5.96	6.95	7.94	8.93	59.6	119.1	178.7	238.2	297.8
11	.984	.97	.95	.93	.92	.90	.89	.87	.85	9.0	8.0	7.0	6.1	5.1
12	.975	.95	.92	.90	.87	.85	.82	.80	.77	8.5	6.9	5.4	3.9	92.4
13	.966	.93	.90	.86	.83	.79	.76	.73	.69	7.9	5.9	3.8	31.7	89.7
14	.957	.91	.87	.83	.78	.74	.70	.65	.61	7.4	4.8	2.2	29.6	7.0
88 15	0.948	1.90	2.84	3.79	4.74	5.69	6.63	7.58	8.53	56.9	113.7	170.6	227.4	284.3
16	.938	.88	.82	.75	.69	.63	.57	.51	.45	6.3	2.6	68.9	5.2	81.5
17	.929	.86	.79	.72	.65	.58	.51	.43	.36	5.8	1.5	7.3	3.1	78.8
18	.920	.84	.76	.68	.60	.52	.44	.36	.28	5.2	10.5	5.7	20.9	6.1
19	.911	.82	.73	.65	.56	.47	.38	.29	.20	4.7	09.4	4.1	18.7	3.4
88 20	0.902	1.80	2.71	3.61	4.51	5.41	6.32	7.22	8.12	54.1	108.3	162.4	216.6	270.7
21	.893	.79	.68	.57	.47	.36	.25	.15	8.04	3.6	7.2	60.8	4.4	68.0
22	.884	.77	.65	.54	.42	.31	.19	.07	7.96	3.1	6.1	59.2	2.2	5.3
23	.875	.75	.63	.50	.38	.25	.13	7.00	.88	2.5	5.0	7.6	10.1	62.6
24	.866	.73	.60	.47	.33	.20	.06	6.93	.80	2.0	4.0	5.9	07.9	59.9
88 25	0.857	1.71	2.57	3.43	4.29	5.14	6.00	6.86	7.72	51.4	102.9	154.3	205.7	257.2
26	.848	.70	.55	.39	.24	.09	5.94	.79	.63	0.9	1.8	2.7	3.6	4.5
27	.839	.68	.52	.36	.20	5.04	.88	.71	.55	50.4	100.7	51.1	201.4	51.8
28	.830	.66	.49	.32	.15	4.98	.81	.64	.47	49.8	99.6	49.4	199.3	49.1
29	.821	.64	.46	.29	.11	.93	.75	.57	.39	9.3	8.5	7.8	7.1	6.4
88 30	0.812	1.62	2.44	3.25	4.06	4.87	5.69	6.50	7.31	48.7	97.5	146.2	194.9	243.7
31	.803	.61	.41	.21	4.02	.82	.62	.42	.23	8.2	6.4	4.6	2.8	40.9
32	.794	.59	.38	.18	3.97	.76	.56	.35	.15	7.6	5.3	2.9	90.6	38.2
33	.785	.57	.36	.14	.93	.71	.50	.28	7.07	7.1	4.2	41.3	88.4	5.5
34	.776	.55	.33	.10	.88	.66	.43	.21	6.98	6.6	3.1	39.7	6.3	2.8
88 35	0.767	1.53	2.30	3.07	3.84	4.60	5.37	6.14	6.90	46.0	92.0	138.1	184.1	230.1
36	.758	.52	.27	.03	.79	.55	.31	.06	.82	5.5	91.0	6.4	81.9	27.4
37	.749	.50	.25	3.00	.75	.49	.24	5.99	.74	4.9	89.9	4.8	79.8	4.7
38	.740	.48	.22	2.96	.70	.44	.18	.92	.66	4.4	8.8	3.2	7.6	22.0
39	.731	.46	.19	.92	.65	.39	.12	.85	.58	3.9	7.7	1.6	5.4	19.3
88 40	0.722	1.44	2.17	2.89	3.61	4.33	5.05	5.78	6.50	43.3	86.6	130.0	173.3	216.6
41	.713	.43	.14	.85	.57	.28	4.99	.70	.42	2.8	5.6	28.3	71.1	3.9
42	.704	.41	.11	.82	.52	.22	.93	.63	.34	2.2	4.5	6.7	68.9	11.2
43	.695	.39	.09	.78	.48	.17	.86	.56	.26	1.7	3.4	5.1	6.8	08.5
44	.686	.37	.06	.74	.43	.12	.80	.49	.17	1.2	2.3	3.5	4.6	5.8
88 45	0.677	1.35	2.03	2.71	3.39	4.06	4.74	5.42	6.09	40.6	81.2	121.8	162.4	203.1
46	.668	.34	2.00	.67	.34	4.01	.67	.34	6.01	40.1	80.1	20.2	60.3	200.3
47	.659	.32	1.98	.63	.29	3.95	.61	.27	5.93	39.5	79.1	18.6	58.1	197.6
48	.650	.30	.95	.60	.25	.90	.55	.20	.85	9.0	8.0	7.0	5.9	4.9
49	.641	.28	.92	.56	.20	.84	.48	.13	.77	8.4	6.9	5.3	3.8	92.2
88 50	0.632	1.26	1.90	2.53	3.16	3.79	4.42	5.05	5.69	37.9	75.8	113.7	151.6	189.5
51	.623	.25	.87	.49	.11	.74	.36	4.98	.60	7.4	4.7	2.1	49.4	6.8
52	.614	.23	.84	.45	.07	.68	.30	.91	.53	6.8	3.6	10.5	7.3	4.1
53	.605	.21	.81	.42	3.02	.63	.23	.84	.44	6.3	2.6	08.8	5.1	81.4
54	.596	.19	.79	.38	2.98	.57	.17	.77	.36	5.7	1.5	7.2	3.0	78.7
88 55	0.587	1.17	1.76	2.35	2.93	3.52	4.11	4.69	5.28	35.2	70.4	105.6	140.8	176.0
56	.578	.16	.73	.31	.89	.47	4.04	.62	.20	4.7	69.3	4.0	38.6	3.3
57	.569	.14	.71	.27	.84	.41	3.98	.55	.12	4.1	8.2	2.3	6.5	70.6
58	.560	.12	.68	.24	.80	.36	.92	.48	5.04	3.6	7.1	100.7	4.3	67.9
59	.551	.10	.65	.20	.75	.30	.85	.41	4.96	3.0	6.1	99.1	2.1	5.2
88 60	0.542	1.08	1.62	2.17	2.71	3.25	3.79	4.33	4.87	32.5	65.0	97.5	130.0	162.5

Lat.		Latitude 88° to 89°—Meridional arcs.						Latitude 88°—Co-ordinates of curvature.		
		Value of 1″	Sums of seconds for middle latitude 88° 30′		Value of 1′	Continuous sums of minutes from latitude 88° 00′		Longitude.	X	Y
°	′	*Meters.*	″	*Meters.*	*Meters.*	′	*Meters.*	° ′	*Meters.*	*Meters.*
88	00	31.027			1861.63					
	1	7	1	31.03	.63	1	1 861.6	0 1	65.0	0.0
	2	7	2	62.05	.63	2	3 723.3	2	130.0	0.0
	3	7	3	93.08	.63	3	5 584.9	3	194.9	0.1
	4	7	4	124.11	.63	4	7 446.5	4	259.9	0.2
88	05	31.027	5	155.14	1861.63	5	9 308.2	0 5	324.9	0.2
	6	7	6	186.16	.63	6	11 169.8	6	389.8	0.3
	7	7	7	217.19	.64	7	13 031.4	7	454.8	0.5
	8	7	8	248.22	.64	8	14 893.1	8	519.8	0.6
	9	7	9	279.24	.64	9	16 754.7	9	584.7	0.8
88	10	31.027	10	310.27	1861.64	10	18 616.4	0 10	649.7	0.9
	11	7	1	341.30	.64	1	20 478.0	15	974.6	2.1
	12	7	2	372.33	.64	2	22 339.6	20	1 299.4	3.8
	13	7	3	403.35	.64	3	24 201.3	25	1 624.3	5.9
	14	7	4	434.38	.64	4	26 062.9	30	1 949.1	8.5
88	15	31.027	15	465.41	1861.64	15	27 924.5	0 35	2 273.9	11.6
	16	7	6	496.44	.64	6	29 786.2	40	2 598.8	15.1
	17	7	7	527.46	.64	7	31 647.8	45	2 923.6	19.1
	18	7	8	558.49	.64	8	33 509.5	50	3 248.4	23.6
	19	7	9	589.52	.64	9	35 371.1	55	3 573.2	28.6
88	20	31.027	20	620.55	1861.64	20	37 232.7	1 00	3 898.1	34.0
	21	7	1	651.57	.64	1	39 094.4	05	4 222.9	39.9
	22	7	2	682.60	.64	2	40 956.0	10	4 547.6	46.3
	23	7	3	713.63	.64	3	42 817.7	15	4 872.4	53.1
	24	7	4	744.65	.64	4	44 679.3	20	5 197.2	60.4
88	25	31.027	25	775.68	1861.64	25	46 540.9	1 25	5 521.9	68.2
	26	7	6	806.71	.64	6	48 402.6	30	5 846.7	76.5
	27	7	7	837.74	.64	7	50 264.2	35	6 171.4	85.2
	28	7	8	868.76	.64	8	52 125.9	40	6 496.1	94.4
	29	7	9	899.79	.64	9	53 987.5	45	6 820.8	104.1
88	30	31.027	30	930.82	1861.64	30	55 849.1	1 50	7 145.5	114.3
	31	7	1	961.85	.64	1	57 910.8	55	7 470.2	124.9
	32	7	2	992.87	.64	2	59 572.4	2 00	7 795	136
	33	7	3	1 023.90	.64	3	61 434.1	3 00	11 689	306
	34	7	4	1 054.93	.64	4	63 295.7	4 00	15 580	544
88	35	31.027	35	1 085.95	1861.64	35	65 157.4	5 00	19 466	849
	36	7	6	1 116.98	.64	6	67 019.0	6 00	23 347	1 223
	37	7	7	1 148.01	.64	7	68 880.7	7 00	27 220	1 664
	38	7	8	1 179.04	.64	8	70 742.3	8 00	31 085	2 172
	39	7	9	1 210.06	.65	9	72 603.9	9 00	34 940	2 748
88	40	31.027	40	1 241.09	1861.65	40	74 465.6	10 00	38 785	3 391
	41	7	1	1 272.12	.65	1	76 327.2	11 00	42 618	4 101
	42	7	2	1 303.15	.65	2	78 188.9	12 00	46 438	4 878
	43	7	3	1 334.17	.65	3	80 050.5	13 00	50 244	5 721
	44	7	4	1 365.20	.65	4	81 912.2	14 00	54 035	6 631
88	45	31.027	45	1 396.23	1861.65	45	83 773.8	15 00	57 809	7 606
	46	7	6	1 427.26	.65	6	85 635.5	16 00	61 565	8 647
	47	7	7	1 458.28	.65	7	87 497.1	17 00	65 303	9 754
	48	7	8	1 489.31	.65	8	89 358.8	18 00	69 021	10 925
	49	7	9	1 520.34	.65	9	91 220.4	19 00	72 718	12 161
88	50	31.027	50	1 551.37	1861.65	50	93 082.1	20 00	76 393	13 462
	51	7	1	1 582.39	.65	1	94 943.7	21 00	80 045	14 826
	52	7	2	1 613.42	.65	2	96 805.4	22 00	83 672	16 254
	53	7	3	1 644.45	.65	3	98 667.0	23 00	87 274	17 745
	54	7	4	1 675.48	.65	4	100 528.7	24 00	90 849	19 298
88	55	31.027	55	1 706.50	1861.65	55	102 390.3	25 00	94 397	20 914
	56	7	6	1 737.53	.65	6	104 252.0	26 00	97 915	22 591
	57	7	7	1 768.56	.65	7	106 113.6	27 00	101 405	24 330
	58	7	8	1 799.59	.65	8	107 975.3	28 00	104 863	26 129
	59	7	9	1 830.61	.65	9	109 836.9	29 00	108 289	27 988
88	60	31.027	60	1 861.64	1861.65	60	111 698.6	30 00	111 683	29 906

Latitude 89° to 90°—Arcs of the parallel in meters.

Lat.	1″	2″	3″	4″	5″	6″	7″	8″	9″	1′	2′	3′	4′	5′
° ′														
89 00	0.542	1.08	1.62	2.17	2.71	3.25	3.79	4.33	4.87	32.5	65.0	97.5	130.0	162.5
1	.532	.06	.60	.13	.66	.19	.73	.26	.79	1.9	3.9	5.8	27.8	59.7
2	.523	.05	.57	.09	.62	.14	.66	.19	.71	1.4	2.8	4.2	5.6	7.0
3	.514	.03	.54	.06	.57	.09	.60	.11	.63	0.9	1.7	2.6	3.5	4.3
4	.505	1.01	.52	2.02	.53	3.03	.54	4.04	.55	30.3	60.6	91.0	21.3	51.6
89 05	0.496	0.99	1.49	1.99	2.48	2.98	3.47	3.97	4.47	29.8	59.6	89.3	119.1	148.9
6	.487	.97	.46	.95	.44	.92	.41	.90	.39	9.2	8.5	7.7	7.0	6.2
7	.478	.96	.43	.91	.39	.87	.35	.83	.30	8.7	7.4	6.1	4.8	3.5
8	.469	.94	.41	.88	.35	.82	.29	.75	.22	8.2	6.3	4.5	2.6	40.8
9	.460	.92	.38	.84	.30	.76	.22	.68	.14	7.6	5.2	2.9	10.5	38.1
89 10	0.451	0.90	1.35	1.81	2.26	2.71	3.16	3.61	4.06	27.1	54.2	81.2	108.3	135.4
11	.442	.88	.33	.77	.21	.65	.10	.54	3.98	6.5	3.1	79.6	6.1	2.7
12	.433	.87	.30	.73	.17	.60	3.03	.47	.90	6.0	2.0	8.0	4.0	30.0
13	.424	.85	.27	.70	.12	.55	2.97	.39	.82	5.5	50.9	6.4	101.8	27.3
14	.415	.83	.24	.66	.08	.49	.91	.32	.74	4.9	49.8	4.7	99.6	4.5
89 15	0.406	0.81	1.22	1.62	2.03	2.44	2.84	3.25	3.65	24.4	48.7	73.1	97.5	121.8
16	.397	.79	.19	.59	1.99	.38	.78	.18	.57	3.8	7.7	71.5	5.3	19.1
17	.388	.78	.16	.55	.94	.33	.72	.10	.49	3.3	6.6	69.9	3.1	6.4
18	.379	.76	.14	.52	.90	.27	.65	3.03	.41	2.7	5.5	8.2	91.0	3.7
19	.370	.74	.11	.48	.85	.22	.59	2.96	.33	2.2	4.4	6.6	88.8	11.0
89 20	0.361	0.72	1.08	1.44	1.81	2.17	2.53	2.89	3.25	21.7	43.3	65.0	86.6	108.3
21	.352	.70	.06	.41	.76	.12	.46	.82	.17	1.1	2.2	3.4	4.5	5.6
22	.343	.69	.03	.37	.72	.06	.40	.74	.09	0.6	1.2	1.7	2.3	2.9
23	.334	.67	1.00	.34	.67	2.00	.34	.67	3.01	20.0	40.1	60.1	80.1	100.2
24	.325	.65	0.97	.30	.63	1.95	.28	.60	2.93	19.5	39.0	58.5	78.0	97.5
89 25	0.316	0.63	0.95	1.26	1.58	1.90	2.21	2.53	2.84	19.0	37.9	56.9	75.8	94.8
26	.307	.61	.92	.23	.53	.84	.15	.46	.76	8.4	6.8	5.2	3.6	92.1
27	.298	.60	.89	.19	.49	.79	.09	.38	.68	7.9	5.7	3.6	71.5	89.4
28	.289	.58	.87	.15	.44	.73	2.02	.31	.60	7.3	4.7	2.0	69.3	6.6
29	.280	.56	.84	.12	.40	.68	1.96	.24	.52	6.8	3.6	50.4	7.1	3.9
89 30	0.271	0.54	0.81	1.08	1.35	1.62	1.89	2.17	2.44	16.2	32.5	48.7	65.0	81.2
31	.262	.52	.78	.05	.31	.57	.83	.09	.36	5.7	1.4	7.1	2.8	78.5
32	.253	.50	.76	1.01	.26	.52	.77	2.02	.27	5.2	30.3	5.5	60.7	5.8
33	.244	.49	.73	0.97	.22	.46	.71	1.95	.19	4.6	29.2	3.9	58.5	3.1
34	.235	.47	.70	.94	.17	.41	.64	.88	.11	4.1	8.2	2.2	6.3	70.4
89 35	0.226	0.45	0.68	0.90	1.13	1.35	1.58	1.81	2.03	13.5	27.1	40.6	54.2	67.7
36	.217	.43	.65	.87	.08	.30	.52	.73	1.95	3.0	6.0	39.0	52.0	5.0
37	.208	.41	.62	.83	1.04	.25	.45	.66	.87	2.5	4.9	7.4	49.8	62.3
38	.199	.40	.60	.79	0.99	.19	.39	.59	.79	1.9	3.8	5.7	7.7	59.6
39	.190	.38	.57	.76	.95	.14	.33	.52	.71	1.4	2.7	4.1	5.5	6.9
89 40	0.181	0.36	0.54	0.72	0.90	1.08	1.26	1.45	1.63	10.8	21.7	32.5	43.3	54.2
41	.171	.34	.51	.69	.86	1.03	.20	.37	.54	10.3	20.6	30.9	41.2	51.4
42	.162	.32	.49	.65	.81	0.97	.14	.30	.46	9.7	19.5	29.2	39.0	48.7
43	.153	.31	.46	.61	.77	.92	.07	.23	.38	9.2	8.4	7.6	6.8	6.0
44	.144	.29	.43	.58	.72	.87	1.01	.15	.30	8.7	7.3	6.0	4.7	3.3
89 45	0.135	0.27	0.41	0.54	0.68	0.81	0.95	1.08	1.22	8.1	16.2	24.4	32.5	40.6
46	.126	.25	.38	.51	.63	.76	.88	1.01	.14	7.6	5.2	2.7	30.3	37.9
47	.117	.23	.35	.47	.59	.70	.82	0.94	1.06	7.0	4.1	21.1	28.2	5.2
48	.108	.22	.32	.43	.54	.65	.76	.87	0.98	6.5	3.0	19.5	6.0	32.5
49	.099	.20	.30	.40	.50	.60	.70	.79	.89	6.0	1.9	7.9	3.8	29.8
89 50	0.090	0.18	0.27	0.36	0.45	0.54	0.63	0.72	0.81	5.4	10.8	16.2	21.7	27.1
51	.081	.16	.24	.33	.41	.49	.57	.65	.73	4.9	9.7	4.6	19.5	4.4
52	.072	.14	.22	.29	.36	.43	.51	.58	.65	4.3	8.7	3.0	7.3	21.7
53	.063	.13	.19	.25	.32	.38	.44	.51	.57	3.8	7.6	11.4	5.2	19.0
54	.054	.11	.16	.22	.27	.32	.38	.43	.49	3.2	6.5	9.7	3.0	6.2
89 55	0.045	0.09	0.14	0.18	0.23	0.27	0.31	0.36	0.41	2.7	5.4	8.1	10.8	13.5
56	.036	.07	.11	.14	.18	.22	.25	.29	.32	2.2	4.3	6.5	8.7	10.8
57	.027	.05	.08	.11	.14	.16	.19	.22	.24	1.6	3.2	4.9	6.5	8.1
58	.018	.04	.05	.07	.09	.11	.13	.14	.16	1.1	2.2	3.2	4.3	5.4
59	.009	.02	.03	.04	.05	.05	.06	.07	.08	0.5	1.1	1.6	2.2	2.7
89 60	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.0	0.0

Lat.	Latitude 89° to 90°—Meridional arcs.						Latitude 89°—Co-ordinates of curvature.		
	Value of 1″	Sums of seconds for middle latitude 89° 30′		Value of 1′	Continuous sums of minutes from latitude 89° 00′		Longitude.	X	Y
° ′	*Meters.*	″	*Meters.*	*Meters.*	′	*Meters.*	° ′	*Meters.*	*Meters.*
89 00	31.027			1861.65					
1	8	1	31.03	.65	1	1 861.7	0 1	32.5	0.0
2	8	2	62.05	.65	2	3 723.3	2	65.0	0.0
3	8	3	93.08	.65	3	5 585.0	3	97.5	0.0
4	8	4	124.11	.65	4	7 446.6	4	130.0	0.1
89 05	31.028	5	155.14	1861.65	5	9 308.3	0 5	162.4	0.1
6	8	6	186.16	.65	6	11 169.9	6	194.9	0.2
7	8	7	217.19	.65	7	13 031.6	7	227.4	0.2
8	8	8	248.22	.65	8	14 893.2	8	259.9	0.3
9	8	9	279.25	.65	9	16 754.9	9	292.4	0.4
89 10	31.028	10	310.28	1861.65	10	18 616.5	0 10	324.9	0.5
11	8	1	341.30	.65	1	20 478.2	15	487.3	1.1
12	8	2	372.33	.65	2	22 339.8	20	649.8	1.9
13	8	3	403.36	.65	3	24 201.5	25	812.2	3.0
14	8	4	434.39	.65	4	26 063.1	30	974.7	4.3
89 15	31.028	15	465.41	1861.65	15	27 924.8	0 35	1 137.1	5.8
16	8	6	496.44	.65	6	29 786.4	40	1 299.6	7.6
17	8	7	527.47	.65	7	31 648.1	45	1 462.0	9.6
18	8	8	558.49	.65	8	33 509.7	50	1 624.5	11.8
19	8	9	589.52	.65	9	35 371.4	55	1 786.9	14.3
89 20	31.028	20	620.55	1861.65	20	37 233.0	1 00	1 949.3	17.0
21	8	1	651.58	.65	1	39 094.7	05	2 111.7	20.0
22	8	2	682.60	.65	2	40 956.3	10	2 274.2	23.2
23	8	3	713.63	.65	3	42 818.0	15	2 436.6	26.6
24	8	4	744.66	.65	4	44 679.6	20	2 599.0	30.2
89 25	31.028	25	775.69	1861.65	25	46 541.3	1 25	2 761.4	34.1
26	8	6	806.71	.65	6	48 403.0	30	2 923.8	38.3
27	8	7	837.74	.65	7	50 264.6	35	3 086.2	42.6
28	8	8	868.77	.65	8	52 126.3	40	3 248.6	47.3
29	8	9	899.80	.65	9	53 987.9	45	3 411.0	52.1
89 30	31.028	30	930.83	1861.65	30	55 849.6	1 50	3 573.3	57.2
31	8	1	961.85	.65	1	57 711.2	55	3 735.7	62.5
32	8	2	992.88	.65	2	59 572.9	2 00	3 898	68
33	8	3	1 023.91	.65	3	61 434.5	3 00	5 846	153
34	8	4	1 054.94	.65	4	63 296.2	4 00	7 791	272
89 35	31.028	35	1 085.96	1861.65	35	65 157.8	5 00	9 735	425
36	8	6	1 116.99	.65	6	67 019.5	6 00	11 675	612
37	8	7	1 148.02	.65	7	68 881.2	7 00	13 612	832
38	8	8	1 179.05	.65	8	70 742.8	8 00	15 545	1 087
39	8	9	1 210.07	.65	9	72 604.5	9 00	17 473	1 375
89 40	31.028	40	1 241.10	1861.66	40	74 466.1	10 00	19 395	1 697
41	8	1	1 272.13	.66	1	76 327.8	11 00	21 312	2 052
42	8	2	1 303.16	.66	2	78 189.4	12 00	23 222	2 440
43	8	3	1 334.18	.66	3	80 051.1	13 00	25 126	2 862
44	8	4	1 365.21	.66	4	81 912.7	14 00	27 021	3 317
89 45	31.028	45	1 396.24	1861.66	45	83 774.4	15 00	28 908	3 805
46	8	6	1 427.27	.66	6	85 636.1	16 00	30 787	4 326
47	8	7	1 458.29	.66	7	87 497.7	17 00	32 656	4 880
48	8	8	1 489.32	.66	8	89 359.4	18 00	34 515	5 466
49	8	9	1 520.35	.66	9	91 221.0	19 00	36 364	6 084
89 50	31.028	50	1 551.38	1861.66	50	93 082.7	20 00	38 202	6 735
51	8	1	1 582.40	.66	1	94 944.3	21 00	40 028	7 417
52	8	2	1 613.43	.66	2	96 806.0	22 00	41 841	8 132
53	8	3	1 644.46	.66	3	98 667.7	23 00	43 643	8 878
54	8	4	1 675.48	.66	4	100 529.3	24 00	45 430	9 655
89 55	31.028	55	1 706.51	1861.66	55	102 391.0	25 00	47 204	10 463
56	8	6	1 737.54	.66	6	104 252.6	26 00	48 964	11 302
57	8	7	1 768.57	.66	7	106 114.3	27 00	50 708	12 172
58	8	8	1 799.60	.66	8	107 975.9	28 00	52 438	13 072
59	8	9	1 830.62	.66	9	109 837.6	29 00	54 151	14 002
89 60	31.028	60	1 861.65	1861.66	60	111 699.3	30 00	55 848	14 962