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本 表 用 法

本表是根据公式 $h = D \operatorname{tg} \alpha$ 编算的。式中 h 为两点间的高差， D 为水平距离， α 为垂直角。地球曲率及折光差改正数表是根据公式 $f = 0.0000000691 D^2$ 计算的。

例：设测得两点之间的垂直角 $\alpha = +41^\circ 18'$ ，两点之间的水平距离 $D = 1896$ 米，求两点之间的高差 h 。

查表85页得：

$D = 1000$ 米的高差 h 878.52 米

$D = 800$ 米的高差 h 702.82 米

$D = 90$ 米的高差 h 79.067 米

$D = 6$ 米的高差 h 5.2711 米(+)

总计 $D = 1896$ 米的高差 h 1665.6781 米

再以1896米为引数，查地球曲率及折光差改正数表，得改正数 $f = 0.24$ 米，故两端改正后的高差 h 为：

$h = +1665.6781$ 米 $+ 0.24$ 米 $= +1665.92$ 米

0°

分 D	0'	1'	2'	3'	4'	5'	6'	7'	8'	9'	10'	11'	12'	13'	14'
100	0.0	0.029	0.058	0.087	0.116	0.145	0.175	0.204	0.233	0.262	0.291	0.320	0.349	0.378	0.407
200	0.0	0.058	0.116	0.175	0.233	0.291	0.349	0.407	0.465	0.524	0.582	0.640	0.698	0.756	0.814
300	0.0	0.087	0.175	0.262	0.349	0.436	0.524	0.611	0.698	0.785	0.873	0.960	1.047	1.134	1.222
400	0.0	0.116	0.233	0.349	0.465	0.582	0.698	0.814	0.931	1.047	1.164	1.280	1.396	1.513	1.629
500	0.0	0.145	0.291	0.436	0.582	0.727	0.873	1.018	1.164	1.309	1.454	1.600	1.745	1.891	2.036
600	0.0	0.17	0.35	0.52	0.70	0.87	1.05	1.22	1.40	1.57	1.75	1.92	2.09	2.27	2.44
700	0.0	0.20	0.41	0.61	0.81	1.02	1.22	1.43	1.63	1.83	2.04	2.24	2.44	2.65	2.85
800	0.0	0.23	0.47	0.70	0.93	1.16	1.40	1.63	1.86	2.09	2.33	2.56	2.79	3.03	3.26
900	0.0	0.26	0.52	0.79	1.05	1.31	1.57	1.83	2.09	2.36	2.62	2.88	3.14	3.40	3.67

分 D	30'	31'	32'	33'	34'	35'	36'	37'	38'	39'	40'	41'	42'	43'	44'
100	0.873	0.902	0.931	0.960	0.989	1.018	1.047	1.076	1.105	1.135	1.164	1.193	1.222	1.251	1.280
200	1.745	1.804	1.862	1.920	1.978	2.036	2.094	2.153	2.211	2.269	2.327	2.385	2.444	2.502	2.560
300	2.618	2.705	2.793	2.880	2.967	3.054	3.142	3.229	3.316	3.404	3.491	3.578	3.665	3.753	3.840
400	3.491	3.607	3.723	3.840	3.956	4.073	4.189	4.305	4.422	4.538	4.654	4.771	4.887	5.004	5.120
500	4.363	4.509	4.654	4.800	4.945	5.091	5.236	5.382	5.527	5.673	5.818	5.963	6.109	6.254	6.400
600	5.24	5.41	5.59	5.76	5.93	6.11	6.28	6.46	6.63	6.81	6.98	7.16	7.33	7.51	7.68
700	6.11	6.31	6.52	6.72	6.92	7.13	7.33	7.53	7.74	7.94	8.15	8.35	8.55	8.76	8.96
800	6.98	7.21	7.45	7.68	7.91	8.15	8.38	8.61	8.84	9.08	9.31	9.54	9.77	10.01	10.24
900	7.85	8.12	8.38	8.64	8.90	9.16	9.43	9.69	9.95	10.21	10.47	10.73	11.00	11.26	11.52

0°

	15'	16'	17'	18'	19'	20'	21'	22'	23'	24'	25'	26'	27'	28'	29'	30'
0.436	0.465	0.495	0.524	0.553	0.582	0.611	0.640	0.669	0.698	0.727	0.756	0.785	0.815	0.844	0.873	
0.873	0.931	0.989	1.047	1.105	1.164	1.222	1.280	1.338	1.396	1.454	1.513	1.571	1.629	1.687	1.745	
1.309	1.396	1.484	1.571	1.658	1.745	1.833	1.920	2.007	2.094	2.182	2.269	2.356	2.444	2.531	2.618	
1.745	1.862	1.978	2.094	2.211	2.327	2.443	2.560	2.676	2.793	2.909	3.025	3.142	3.258	3.374	3.491	
2.182	2.327	2.473	2.618	2.763	2.909	3.054	3.200	3.345	3.491	3.636	3.782	3.927	4.073	4.218	4.363	
2.62	2.79	2.97	3.14	3.32	3.49	3.67	3.84	4.01	4.19	4.36	4.54	4.71	4.89	5.06	5.24	
3.05	3.26	3.46	3.67	3.87	4.07	4.28	4.48	4.68	4.89	5.09	5.29	5.50	5.70	5.91	6.11	
3.49	3.72	3.96	4.19	4.42	4.65	4.89	5.12	5.35	5.59	5.82	6.05	6.28	6.52	6.75	6.98	
3.93	4.19	4.45	4.71	4.97	5.24	5.50	5.76	6.02	6.28	6.55	6.81	7.07	7.33	7.59	7.85	

	45'	46'	47'	48'	49'	50'	51'	52'	53'	54'	55'	56'	57'	58'	59'	60'
1.309	1.333	1.367	1.396	1.425	1.455	1.484	1.513	1.542	1.571	1.600	1.629	1.658	1.687	1.716	1.746	
2.618	2.676	2.735	2.793	2.851	2.909	2.967	3.025	3.084	3.142	3.200	3.258	3.316	3.375	3.433	3.491	
3.927	4.014	4.102	4.189	4.276	4.364	4.451	4.538	4.625	4.713	4.800	4.887	4.975	5.062	5.149	5.237	
5.236	5.353	5.469	5.585	5.702	5.818	5.935	6.051	6.167	6.284	6.400	6.516	6.633	6.749	6.866	6.982	
6.545	6.691	6.836	6.982	7.127	7.273	7.418	7.564	7.709	7.855	8.000	8.146	8.291	8.437	8.582	8.728	
7.85	8.03	8.20	8.38	8.55	8.73	8.90	9.08	9.25	9.43	9.60	9.77	9.95	10.12	10.30	10.47	
9.16	9.37	9.57	9.77	9.98	10.18	10.39	10.59	10.79	11.00	11.20	11.40	11.61	11.81	12.01	12.22	
10.47	10.71	10.94	11.17	11.40	11.64	11.87	12.10	12.33	12.57	12.80	13.03	13.27	13.50	13.73	13.96	
11.78	12.04	12.31	12.57	12.83	13.09	13.35	13.61	13.88	14.14	14.40	14.66	14.92	15.19	15.45	15.71	

1°

分 D	0'	1'	2'	3'	4'	5'	6'	7'	8'	9'	10'	11'	12'	13'	14'
100	1.746	1.775	1.804	1.833	1.862	1.891	1.920	1.949	1.978	2.007	2.036	2.066	2.095	2.124	2.153
200	3.491	3.549	3.607	3.665	3.724	3.782	3.840	3.898	3.957	4.015	4.073	4.131	4.189	4.248	4.306
300	5.237	5.324	5.411	5.498	5.586	5.673	5.760	5.848	5.935	6.022	6.109	6.197	6.284	6.371	6.459
400	6.982	7.098	7.215	7.331	7.448	7.564	7.680	7.797	7.913	8.030	8.146	8.262	8.379	8.495	8.612
500	8.728	8.873	9.019	9.164	9.309	9.455	9.600	9.746	9.891	10.037	10.182	10.328	10.474	10.619	10.765
600	10.47	10.65	10.82	11.00	11.17	11.35	11.52	11.70	11.87	12.04	12.22	12.39	12.57	12.74	12.92
700	12.22	12.42	12.63	12.83	13.03	13.24	13.44	13.64	13.85	14.05	14.26	14.46	14.66	14.87	15.07
800	13.96	14.20	14.43	14.66	14.90	15.13	15.36	15.59	15.83	16.06	16.29	16.52	16.76	16.99	17.22
900	15.71	15.97	16.23	16.50	16.76	17.02	17.28	17.54	17.80	18.07	18.33	18.59	18.85	19.11	19.38

分 D	30'	31'	32'	33'	34'	35'	36'	37'	38'	39'	40'	41'	42'	43'	44'
100	2.619	2.648	2.677	2.706	2.735	2.764	2.793	2.822	2.851	2.881	2.910	2.939	2.968	2.997	3.026
200	5.237	5.295	5.354	5.412	5.470	5.528	5.587	5.645	5.703	5.761	5.819	5.878	5.936	5.994	6.052
300	7.856	7.943	8.030	8.118	8.205	8.292	8.380	8.467	8.554	8.642	8.729	8.816	8.904	8.991	9.078
400	10.474	10.591	10.707	10.824	10.940	11.057	11.173	11.289	11.406	11.522	11.639	11.755	11.872	11.988	12.105
500	13.093	13.239	13.384	13.530	13.675	13.821	13.966	14.112	14.257	14.403	14.549	14.694	14.840	14.985	15.131
600	15.71	15.89	16.06	16.24	16.41	16.58	16.76	16.93	17.11	17.28	17.46	17.63	17.81	17.98	18.16
700	18.33	18.53	18.74	18.94	19.15	19.35	19.55	19.76	19.96	20.16	20.37	20.57	20.78	20.98	21.18
800	20.95	21.18	21.41	21.65	21.88	22.11	22.35	22.58	22.81	23.04	23.28	23.51	23.74	23.98	24.21
900	23.57	23.83	24.09	24.35	24.62	24.88	25.14	25.40	25.66	25.93	26.19	26.45	26.71	26.97	27.24

15'	16'	17'	18'	19'	20'	21'	22'	23'	24'	25'	26'	27'	28'	29'	30'
2.122	2.211	2.240	2.269	2.298	2.328	2.357	2.386	2.415	2.444	2.473	2.502	2.531	2.560	2.589	2.619
4.364	4.422	4.480	4.539	4.597	4.655	4.713	4.771	4.830	4.888	4.946	5.004	5.063	5.121	5.179	5.237
6.546	6.633	6.721	6.808	6.895	6.983	7.070	7.157	7.245	7.332	7.419	7.506	7.594	7.681	7.768	7.856
8.728	8.844	8.961	9.077	9.194	9.310	9.427	9.543	9.659	9.776	9.892	10.009	10.125	10.242	10.358	10.474
10.910	11.056	11.201	11.347	11.492	11.638	11.783	11.929	12.074	12.220	12.365	12.511	12.656	12.802	12.947	13.093
13.09	13.27	13.44	13.62	13.79	13.97	14.14	14.31	14.49	14.66	14.84	15.01	15.19	15.36	15.54	15.71
15.27	15.48	15.68	15.89	16.09	16.29	16.50	16.70	16.90	17.11	17.31	17.52	17.72	17.92	18.13	18.33
17.46	17.69	17.92	18.15	18.39	18.62	18.85	19.09	19.32	19.55	19.78	20.02	20.25	20.48	20.72	20.95
19.64	19.90	20.16	20.42	20.69	20.95	21.21	21.47	21.73	22.00	22.26	22.52	22.78	23.04	23.31	23.57

45'	46'	47'	48'	49'	50'	51'	52'	53'	54'	55'	56'	57'	58'	59'	60'
3.055	3.084	3.114	3.143	3.172	3.201	3.230	3.259	3.288	3.317	3.346	3.376	3.405	3.434	3.463	3.492
6.111	6.169	6.227	6.285	6.343	6.402	6.460	6.518	6.576	6.635	6.693	6.751	6.809	6.868	6.926	6.984
9.166	9.253	9.341	9.428	9.515	9.603	9.690	9.777	9.865	9.952	10.039	10.127	10.214	10.301	10.389	10.476
12.221	12.338	12.454	12.571	12.687	12.803	12.920	13.036	13.153	13.269	13.386	13.502	13.619	13.735	13.852	13.968
15.276	15.422	15.568	15.713	15.859	16.004	16.150	16.296	16.441	16.587	16.732	16.878	17.024	17.169	17.315	17.460
18.33	18.51	18.68	18.86	19.03	19.21	19.38	19.55	19.73	19.90	20.08	20.25	20.43	20.60	20.78	20.95
21.39	21.59	21.79	22.00	22.20	22.41	22.61	22.81	23.02	23.22	23.43	23.63	23.83	24.04	24.24	24.44
24.44	24.68	24.91	25.14	25.37	25.61	25.84	26.07	26.31	26.54	26.77	27.00	27.24	27.47	27.70	27.94
27.50	27.76	28.02	28.28	28.55	28.81	29.07	29.33	29.59	29.86	30.12	30.38	30.64	30.90	31.17	31.43

2°

分	0'	1'	2'	3'	4'	5'	6'	7'	8'	9'	10'	11'	12'	13'	14'
100	3.492	3.521	3.550	3.579	3.609	3.638	3.667	3.696	3.725	3.754	3.783	3.812	3.842	3.871	3.900
200	6.984	7.042	7.101	7.159	7.217	7.275	7.334	7.392	7.450	7.508	7.567	7.625	7.683	7.741	7.800
300	10.476	10.564	10.651	10.738	10.826	10.913	11.000	11.088	11.175	11.263	11.350	11.437	11.525	11.612	11.700
400	13.968	14.085	14.201	14.318	14.434	14.551	14.667	14.784	14.900	15.017	15.133	15.250	15.366	15.483	15.600
500	17.460	17.606	17.752	17.897	18.043	18.189	18.334	18.480	18.625	18.771	18.917	19.062	19.208	19.354	19.499
600	20.95	21.13	21.30	21.48	21.65	21.83	22.00	22.18	22.35	22.53	22.70	22.87	23.05	23.22	23.40
700	24.44	24.65	24.85	25.06	25.26	25.46	25.67	25.87	26.08	26.28	26.48	26.69	26.89	27.10	27.30
800	27.94	28.17	28.40	28.64	28.87	29.10	29.33	29.57	29.80	30.03	30.27	30.50	30.73	30.97	31.20
900	31.43	31.69	31.95	32.22	32.48	32.74	33.00	33.26	33.53	33.79	34.05	34.31	34.57	34.84	35.10

分	30'	31'	32'	33'	34'	35'	36'	37'	38'	39'	40'	41'	42'	43'	44'
100	4.366	4.395	4.424	4.454	4.483	4.512	4.541	4.570	4.599	4.628	4.658	4.687	4.716	4.745	4.774
200	8.732	8.790	8.849	8.907	8.965	9.024	9.082	9.140	9.199	9.257	9.315	9.373	9.432	9.490	9.548
300	13.098	13.186	13.273	13.361	13.448	13.535	13.623	13.710	13.798	13.885	13.973	14.060	14.148	14.235	14.323
400	17.464	17.581	17.698	17.814	17.931	18.047	18.164	18.280	18.397	18.514	18.630	18.747	18.864	18.980	19.097
500	21.830	21.976	22.122	22.268	22.413	22.559	22.705	22.851	22.996	23.142	23.288	23.434	23.579	23.725	23.871
600	26.20	26.37	26.55	26.72	26.90	27.07	27.25	27.42	27.60	27.77	27.95	28.12	28.30	28.47	28.65
700	30.56	30.77	30.97	31.17	31.38	31.58	31.79	31.99	32.19	32.40	32.60	32.81	33.01	33.22	33.42
800	34.93	35.16	35.40	35.63	35.86	36.09	36.33	36.56	36.79	37.03	37.26	37.49	37.73	37.96	38.19
900	39.29	39.56	39.82	40.08	40.34	40.61	40.87	41.13	41.39	41.66	41.92	42.18	42.44	42.71	42.97

	15'	16'	17'	18'	19'	20'	21'	22'	23'	24'	25'	26'	27'	28'	29'	30'
	3.929	3.958	3.987	4.016	4.046	4.075	4.104	4.133	4.162	4.191	4.220	4.250	4.279	4.308	4.337	4.366
	7.858	7.916	7.975	8.033	8.091	8.149	8.208	8.266	8.324	8.382	8.441	8.499	8.557	8.616	8.674	8.732
	11.787	11.874	11.962	12.049	12.137	12.224	12.311	12.399	12.486	12.574	12.661	12.749	12.836	12.923	13.011	13.098
	15.716	15.833	15.949	16.066	16.182	16.299	16.415	16.532	16.648	16.765	16.882	16.998	17.115	17.231	17.348	17.464
	19.645	19.791	19.936	20.082	20.228	20.373	20.519	20.665	20.811	20.956	21.102	21.248	21.393	21.539	21.685	21.830
	23.57	23.75	23.92	24.10	24.27	24.45	24.62	24.80	24.97	25.15	25.32	25.50	25.67	25.85	26.02	26.20
	27.50	27.71	27.91	28.11	28.32	28.52	28.73	28.93	29.13	29.34	29.54	29.75	29.95	30.15	30.36	30.56
	31.43	31.67	31.90	32.13	32.36	32.60	32.83	33.06	33.30	33.53	33.76	34.00	34.23	34.46	34.70	34.93
	35.36	35.62	35.89	36.15	36.41	36.67	36.93	37.20	37.46	37.72	37.98	38.25	38.51	38.77	39.03	39.29
	45'	46'	47'	48'	49'	50'	51'	52'	53'	54'	55'	56'	57'	58'	59'	60'
	4.803	4.833	4.862	4.891	4.920	4.949	4.978	5.007	5.037	5.066	5.095	5.124	5.153	5.182	5.212	5.241
	9.607	9.655	9.723	9.782	9.840	9.898	9.957	10.015	10.073	10.132	10.190	10.248	10.307	10.365	10.423	10.482
	14.410	14.498	14.585	14.672	14.760	14.847	14.935	15.022	15.110	15.197	15.285	15.372	15.460	15.547	15.635	15.722
	19.213	19.330	19.447	19.563	19.680	19.797	19.913	20.030	20.146	20.263	20.380	20.496	20.613	20.730	20.846	20.963
	24.017	24.163	24.308	24.454	24.600	24.746	24.891	25.037	25.183	25.329	25.475	25.621	25.766	25.912	26.058	26.204
	28.82	29.00	29.17	29.34	29.52	29.69	29.87	30.04	30.22	30.39	30.57	30.74	30.92	31.00	31.27	31.44
	33.62	33.83	34.03	34.24	34.44	34.64	34.85	35.05	35.26	35.46	35.66	35.87	36.07	36.28	36.48	36.69
	38.43	38.66	38.89	39.13	39.36	39.59	39.83	40.06	40.29	40.53	40.76	40.99	41.23	41.46	41.69	41.93
	43.23	43.49	43.75	44.02	44.28	44.54	44.80	45.07	45.33	45.59	45.85	46.12	46.38	46.64	46.90	47.17

分	0'	1'	2'	3'	4'	5'	6'	7'	8'	9'	10'	11'	12'	13'	14'
D															
100	5.241	5.276	5.299	5.328	5.357	5.387	5.416	5.445	5.474	5.503	5.532	5.562	5.591	5.620	5.649
200	10.482	10.540	10.598	10.657	10.715	10.773	10.832	10.890	10.948	11.007	11.065	11.123	11.182	11.240	11.298
300	15.722	15.810	15.897	15.985	16.072	16.160	16.247	16.335	16.422	16.510	16.598	16.685	16.773	16.860	16.948
400	20.963	21.086	21.196	21.313	21.430	21.547	21.663	21.780	21.897	22.013	22.130	22.247	22.363	22.480	22.597
500	26.204	26.350	26.496	26.641	26.787	26.933	27.079	27.225	27.371	27.517	27.663	27.808	27.954	28.100	28.246
600	31.44	31.62	31.79	31.97	32.14	32.32	32.49	32.67	32.84	33.02	33.20	33.37	33.55	33.72	33.90
700	36.69	36.89	37.09	37.30	37.50	37.71	37.91	38.11	38.32	38.52	38.73	38.93	39.14	39.34	39.54
800	41.93	42.16	42.39	42.63	42.86	43.09	43.33	43.56	43.79	44.03	44.26	44.49	44.73	44.96	45.19
900	47.17	47.43	47.69	47.95	48.22	48.48	48.74	49.00	49.27	49.53	49.79	50.06	50.32	50.58	50.84

分	30'	31'	32'	33'	34'	35'	36'	37'	38'	39'	40'	41'	42'	43'	44'
D															
100	6.116	6.145	6.175	6.204	6.233	6.262	6.291	6.321	6.350	6.379	6.408	6.437	6.467	6.496	6.525
200	12.233	12.291	12.349	12.408	12.466	12.525	12.583	12.641	12.700	12.758	12.817	12.875	12.933	12.992	13.050
300	18.349	18.436	18.524	18.612	18.699	18.787	18.874	18.962	19.050	19.137	19.225	19.312	19.400	19.488	19.575
400	24.465	24.582	24.699	24.815	24.932	25.049	25.166	25.283	25.400	25.516	25.633	25.750	25.867	25.984	26.101
500	30.581	30.727	30.873	31.019	31.165	31.311	31.457	31.603	31.749	31.895	32.041	32.187	32.334	32.480	32.626
600	36.70	36.87	37.05	37.22	37.40	37.57	37.75	37.92	38.10	38.27	38.45	38.62	38.80	38.98	39.15
700	42.81	43.02	43.22	43.43	43.63	43.84	44.04	44.24	44.45	44.65	44.86	45.06	45.27	45.47	45.68
800	48.93	49.16	49.40	49.63	49.86	50.10	50.33	50.57	50.80	51.03	51.27	51.50	51.73	51.97	52.20
900	55.05	55.31	55.57	55.83	56.10	56.36	56.62	56.89	57.15	57.41	57.67	57.94	58.20	58.46	58.73

15'	16'	17'	18'	19'	20'	21'	22'	23'	24'	25'	26'	27'	28'	29'	30'
5.676	5.708	5.737	5.766	5.795	5.824	5.854	5.883	5.912	5.941	5.970	5.999	6.029	6.058	6.087	6.116
11.357	11.415	11.474	11.532	11.590	11.649	11.707	11.765	11.824	11.882	11.941	11.999	12.057	12.116	12.174	12.233
17.035	17.123	17.210	17.298	17.385	17.473	17.561	17.648	17.736	17.823	17.911	17.998	18.086	18.174	18.261	18.349
22.714	22.830	22.947	23.064	23.181	23.297	23.414	23.531	23.648	23.764	23.881	23.998	24.115	24.231	24.348	24.465
28.392	28.538	28.684	28.830	28.976	29.122	29.268	29.414	29.560	29.705	29.851	29.997	30.143	30.289	30.435	30.581
34.07	34.25	34.42	34.60	34.77	34.95	35.12	35.30	35.47	35.65	35.82	36.00	36.17	36.35	36.52	36.70
39.75	39.95	40.16	40.36	40.57	40.77	40.97	41.18	41.38	41.59	41.79	42.00	42.20	42.41	42.61	42.81
45.43	45.66	45.89	46.13	46.36	46.59	46.83	47.06	47.30	47.53	47.76	48.00	48.23	48.46	48.70	48.93
51.11	51.37	51.63	51.89	52.16	52.42	52.68	52.94	53.21	53.47	53.73	54.00	54.26	54.52	54.78	55.05

45'	46'	47'	48'	49'	50'	51'	52'	53'	54'	55'	56'	57'	58'	59'	60'
6.554	6.584	6.613	6.642	6.671	6.700	6.730	6.759	6.788	6.817	6.847	6.876	6.905	6.934	6.963	6.993
13.109	13.167	13.226	13.284	13.342	13.401	13.459	13.518	13.576	13.635	13.693	13.752	13.810	13.868	13.927	13.985
19.663	19.751	19.838	19.926	20.014	20.101	20.189	20.277	20.364	20.452	20.540	20.627	20.715	20.803	20.890	20.978
26.217	26.334	26.451	26.568	26.685	26.802	26.919	27.035	27.152	27.269	27.386	27.503	27.620	27.737	27.854	27.971
32.772	32.918	33.064	33.210	33.356	33.502	33.648	33.794	33.940	34.087	34.233	34.379	34.525	34.671	34.817	34.963
39.33	39.50	39.68	39.85	40.03	40.20	40.38	40.55	40.73	40.90	41.08	41.25	41.43	41.61	41.78	41.96
45.88	46.08	46.29	46.49	46.70	46.90	47.11	47.31	47.52	47.72	47.93	48.13	48.33	48.54	48.74	48.95
52.43	52.67	52.90	53.14	53.37	53.60	53.84	54.07	54.30	54.54	54.77	55.01	55.24	55.47	55.71	55.94
59.99	59.25	59.51	59.78	60.04	60.30	60.57	60.83	61.09	61.36	61.62	61.88	62.14	62.41	62.67	62.93

4°

分	0'	1'	2'	3'	4'	5'	6'	7'	8'	9'	10'	11'	12'	13'	14'
100	6.993	7.022	7.051	7.080	7.110	7.139	7.168	7.197	7.227	7.256	7.285	7.314	7.344	7.373	7.402
200	13.985	14.044	14.102	14.161	14.219	14.278	14.336	14.395	14.453	14.512	14.570	14.629	14.687	14.746	14.804
300	20.978	21.066	21.153	21.241	21.329	21.417	21.504	21.592	21.680	21.767	21.855	21.943	22.031	22.118	22.206
400	27.971	28.088	28.205	28.322	28.438	28.555	28.672	28.789	28.906	29.023	29.140	29.257	29.374	29.491	29.608
500	34.963	35.110	35.256	35.402	35.548	35.694	35.840	35.987	36.133	36.279	36.425	36.571	36.718	36.864	37.010
600	41.96	42.13	42.31	42.48	42.66	42.83	43.01	43.18	43.36	43.53	43.71	43.89	44.06	44.24	44.41
700	48.95	49.15	49.36	49.56	49.77	49.97	50.18	50.38	50.59	50.79	51.00	51.20	51.40	51.61	51.81
800	55.94	56.18	56.41	56.64	56.88	57.11	57.34	57.58	57.81	58.05	58.28	58.51	58.75	58.98	59.22
900	62.93	63.20	63.46	63.72	63.99	64.25	64.51	64.78	65.04	65.30	65.57	65.83	66.09	66.36	66.62

分	30'	31'	32'	33'	34'	35'	36'	37'	38'	39'	40'	41'	42'	43'	44'
100	7.870	7.899	7.929	7.958	7.987	8.017	8.046	8.075	8.104	8.134	8.163	8.192	8.221	8.251	8.280
200	15.740	15.799	15.857	15.916	15.975	16.033	16.092	16.150	16.209	16.267	16.326	16.384	16.443	16.502	16.560
300	23.611	23.698	23.786	23.874	23.962	24.050	24.137	24.225	24.313	24.401	24.489	24.577	24.664	24.752	24.840
400	31.481	31.598	31.715	31.832	31.949	32.066	32.183	32.300	32.417	32.536	32.652	32.769	32.886	33.003	33.120
500	39.351	39.497	39.644	39.790	39.936	40.083	40.229	40.375	40.522	40.668	40.815	40.961	41.107	41.254	41.400
600	47.22	47.40	47.57	47.75	47.92	48.10	48.27	48.45	48.63	48.80	48.98	49.15	49.33	49.50	49.68
700	55.09	55.30	55.50	55.71	55.91	56.12	56.32	56.53	56.73	56.94	57.14	57.35	57.55	57.76	57.96
800	62.96	63.20	63.43	63.66	63.90	64.13	64.37	64.60	64.83	65.07	65.30	65.54	65.77	66.01	66.24
900	70.83	71.09	71.36	71.62	71.89	72.15	72.41	72.68	72.94	73.20	73.47	73.73	73.99	74.26	74.52

	15'	16'	17'	18'	19'	20'	21'	22'	23'	24'	25'	26'	27'	28'	29'	30'
	7.431	7.461	7.490	7.519	7.548	7.578	7.607	7.636	7.665	7.695	7.724	7.753	7.782	7.812	7.841	7.870
	14.863	14.921	14.980	15.038	15.097	15.155	15.214	15.272	15.331	15.389	15.448	15.506	15.565	15.623	15.682	15.740
	22.294	22.382	22.469	22.557	22.645	22.733	22.820	22.908	22.996	23.084	23.172	23.259	23.347	23.435	23.523	23.611
	29.725	29.842	29.959	30.076	30.193	30.310	30.427	30.544	30.661	30.778	30.895	31.012	31.129	31.247	31.364	31.481
	37.156	37.303	37.449	37.595	37.741	37.888	38.034	38.180	38.327	38.473	38.619	38.766	38.912	39.058	39.205	39.351
	44.59	44.76	44.94	45.11	45.29	45.47	45.64	45.82	45.99	46.17	46.34	46.52	46.69	46.87	47.05	47.22
	52.02	52.22	52.43	52.63	52.84	53.04	53.25	53.45	53.66	53.86	54.07	54.27	54.48	54.68	54.89	55.09
	59.45	59.68	59.92	60.15	60.39	60.62	60.85	61.09	61.32	61.56	61.79	62.02	62.26	62.49	62.73	62.96
	66.88	67.14	67.41	67.67	67.93	68.20	68.46	68.72	68.99	69.25	69.51	69.78	70.04	70.30	70.57	70.83

	45'	46'	47'	48'	49'	50'	51'	52'	53'	54'	55'	56'	57'	58'	59'	60'
	8.309	8.339	8.368	8.397	8.427	8.456	8.485	8.514	8.544	8.573	8.602	8.632	8.661	8.690	8.720	8.749
	16.619	16.677	16.736	16.794	16.853	16.912	16.970	17.029	17.087	17.146	17.205	17.263	17.322	17.380	17.439	17.498
	24.928	25.016	25.104	25.192	25.280	25.367	25.455	25.543	25.631	25.719	25.807	25.895	25.983	26.071	26.159	26.247
	33.237	33.355	33.472	33.589	33.706	33.823	33.940	34.058	34.175	34.292	34.409	34.527	34.644	34.761	34.878	34.995
	41.547	41.693	41.840	41.986	42.133	42.279	42.426	42.572	42.719	42.865	43.012	43.158	43.305	43.451	43.598	43.744
	49.86	50.03	50.21	50.38	50.56	50.73	50.91	51.09	51.26	51.44	51.61	51.79	51.97	52.14	52.32	52.49
	58.17	58.37	58.58	58.78	58.99	59.19	59.40	59.60	59.81	60.01	60.22	60.42	60.63	60.83	61.04	61.24
	66.47	66.71	66.94	67.18	67.41	67.65	67.88	68.12	68.35	68.58	68.82	69.05	69.29	69.52	69.76	69.99
	74.78	75.05	75.31	75.58	75.84	76.10	76.37	76.63	76.89	77.16	77.42	77.68	77.95	78.21	78.48	78.74

5°

分	0'	1'	2'	3'	4'	5'	6'	7'	8'	9'	10'	11'	12'	13'	14'
100	8.749	8.778	8.807	8.837	8.866	8.895	8.925	8.954	8.983	9.013	9.042	9.071	9.101	9.130	9.159
200	17.496	17.556	17.615	17.674	17.732	17.791	17.850	17.908	17.967	18.025	18.084	18.143	18.201	18.260	18.319
300	26.247	26.335	26.422	26.510	26.598	26.686	26.774	26.862	26.950	27.038	27.126	27.214	27.302	27.390	27.478
400	34.995	35.113	35.230	35.347	35.464	35.582	35.699	35.816	35.934	36.051	36.168	36.286	36.403	36.520	36.638
500	43.744	43.891	44.037	44.184	44.331	44.477	44.624	44.770	44.917	45.064	45.210	45.357	45.504	45.650	45.797
600	52.49	52.67	52.84	53.02	53.20	53.37	53.55	53.72	53.90	54.08	54.25	54.43	54.60	54.78	54.96
700	61.24	61.45	61.65	61.86	62.06	62.27	62.47	62.68	62.88	63.09	63.29	63.50	63.70	63.91	64.12
800	69.99	70.23	70.46	70.69	70.93	71.16	71.40	71.63	71.87	72.10	72.34	72.57	72.81	73.04	73.28
900	78.74	79.00	79.27	79.53	79.80	80.06	80.32	80.59	80.85	81.11	81.38	81.64	81.91	82.17	82.43

分	30'	31'	32'	33'	34'	35'	36'	37'	38'	39'	40'	41'	42'	43'	44'
100	9.629	9.658	9.688	9.717	9.746	9.776	9.805	9.834	9.864	9.893	9.923	9.952	9.981	10.011	10.040
200	19.258	19.317	19.375	19.434	19.493	19.551	19.610	19.669	19.728	19.786	19.845	19.904	19.963	20.021	20.080
300	28.887	28.975	29.063	29.151	29.239	29.327	29.415	29.503	29.591	29.680	29.768	29.856	29.944	30.032	30.120
400	38.516	38.633	38.750	38.868	38.985	39.103	39.220	39.338	39.455	39.573	39.690	39.808	39.925	40.043	40.160
500	48.145	48.281	48.438	48.585	48.732	48.879	49.025	49.172	49.319	49.466	49.613	49.760	49.907	50.054	50.200
600	57.77	57.95	58.13	58.30	58.48	58.65	58.83	59.01	59.18	59.36	59.54	59.71	59.89	60.06	60.24
700	67.40	67.61	67.81	68.02	68.22	68.43	68.64	68.84	69.05	69.25	69.46	69.66	69.87	70.07	70.28
800	77.03	77.27	77.50	77.74	77.97	78.21	78.44	78.68	78.91	79.15	79.38	79.62	79.85	80.09	80.32
900	86.66	86.92	87.19	87.45	87.72	87.98	88.25	88.51	88.77	89.04	89.30	89.57	89.83	90.10	90.36

5°

	15'	16'	17'	18'	19'	20'	21'	22'	23'	24'	25'	26'	27'	28'	29'	30'
	9.189	9.218	9.247	9.277	9.306	9.335	9.365	9.394	9.423	9.453	9.482	9.511	9.541	9.570	9.600	9.629
	18.377	18.436	18.495	18.553	18.612	18.671	18.729	18.788	18.847	18.906	18.964	19.023	19.082	19.140	19.199	19.258
	27.566	27.654	27.742	27.830	27.918	28.006	28.094	28.182	28.270	28.358	28.446	28.534	28.623	28.711	28.799	28.887
	36.755	36.872	36.990	37.107	37.224	37.342	37.459	37.576	37.694	37.811	37.929	38.046	38.163	38.281	38.398	38.516
	45.944	46.090	46.237	46.384	46.530	46.677	46.824	46.970	47.117	47.264	47.411	47.557	47.704	47.851	47.998	48.145
	55.13	55.31	55.48	55.66	55.84	56.01	56.19	56.36	56.54	56.72	56.89	57.07	57.25	57.42	57.60	57.77
	64.32	64.53	64.73	64.94	65.14	65.35	65.56	65.76	65.96	66.17	66.37	66.58	66.79	66.99	67.20	67.40
	73.51	73.74	73.98	74.21	74.45	74.68	74.92	75.15	75.39	75.62	75.86	76.09	76.33	76.56	76.80	77.03
	82.70	82.96	83.23	83.49	83.75	84.02	84.28	84.55	84.81	85.08	85.34	85.60	85.87	86.13	86.40	86.66

	45'	46'	47'	48'	49'	50'	51'	52'	53'	54'	55'	56'	57'	58'	59'	60'
	10.069	10.099	10.128	10.158	10.187	10.216	10.246	10.275	10.305	10.334	10.363	10.393	10.422	10.452	10.481	10.510
	20.139	20.198	20.256	20.315	20.374	20.433	20.492	20.550	20.609	20.668	20.727	20.786	20.844	20.903	20.962	21.021
	30.208	30.297	30.385	30.473	30.561	30.649	30.737	30.826	30.914	31.002	31.090	31.178	31.267	31.355	31.443	31.531
	40.278	40.395	40.513	40.631	40.748	40.866	40.983	41.101	41.218	41.336	41.454	41.571	41.689	41.806	41.924	42.042
	50.347	50.494	50.641	50.788	50.935	51.082	51.229	51.376	51.523	51.670	51.817	51.964	52.111	52.258	52.405	52.552
	60.42	60.59	60.77	60.95	61.12	61.29	61.47	61.65	61.83	62.00	62.18	62.36	62.53	62.71	62.89	63.06
	70.49	70.69	70.90	71.10	71.31	71.51	71.72	71.93	72.13	72.34	72.54	72.75	72.96	73.16	73.37	73.57
	80.56	80.79	81.03	81.26	81.50	81.73	81.97	82.20	82.44	82.67	82.91	83.14	83.38	83.61	83.85	84.08
	90.63	90.89	91.15	91.42	91.68	91.95	92.21	92.48	92.74	93.01	93.27	93.54	93.80	94.06	94.33	94.59

6°

分 D	0'	1'	2'	3'	4'	5'	6'	7'	8'	9'	10'	11'	12'	13'	14'
100	10.510	10.540	10.560	10.590	10.628	10.657	10.687	10.716	10.746	10.776	10.805	10.834	10.863	10.893	10.922
200	21.021	21.080	21.138	21.197	21.256	21.315	21.374	21.433	21.492	21.550	21.609	21.668	21.727	21.786	21.845
300	31.531	31.620	31.708	31.796	31.884	31.972	32.061	32.149	32.237	32.326	32.414	32.502	32.590	32.679	32.767
400	42.042	42.159	42.277	42.395	42.512	42.630	42.748	42.865	42.983	43.101	43.218	43.336	43.454	43.572	43.689
500	52.552	52.699	52.845	52.993	53.140	53.287	53.435	53.582	53.729	53.876	54.023	54.170	54.317	54.465	54.612
600	63.06	63.24	63.42	63.59	63.77	63.94	64.12	64.30	64.47	64.65	64.83	65.00	65.18	65.36	65.53
700	73.57	73.78	73.98	74.19	74.40	74.60	74.81	75.01	75.22	75.43	75.63	75.84	76.04	76.25	76.46
800	84.08	84.32	84.55	84.79	85.02	85.26	85.50	85.73	85.97	86.20	86.44	86.67	86.91	87.14	87.38
900	94.59	94.86	95.12	95.39	95.65	95.92	96.18	96.45	96.71	96.98	97.24	97.51	97.77	98.04	98.30

分 D	30'	31'	32'	33'	34'	35'	36'	37'	38'	39'	40'	41'	42'	43'	44'
100	11.394	11.423	11.452	11.482	11.511	11.541	11.570	11.600	11.629	11.659	11.688	11.718	11.747	11.777	11.806
200	22.787	22.846	22.905	22.964	23.023	23.082	23.141	23.200	23.259	23.318	23.377	23.436	23.495	23.554	23.613
300	34.181	34.269	34.357	34.446	34.534	34.623	34.711	34.800	34.888	34.977	35.065	35.153	35.242	35.330	35.419
400	45.574	45.692	45.810	45.928	46.046	46.164	46.282	46.399	46.517	46.635	46.753	46.871	46.989	47.107	47.225
500	56.968	57.115	57.262	57.410	57.557	57.705	57.852	57.999	58.147	58.294	58.442	58.589	58.736	58.884	59.031
600	68.36	68.54	68.71	68.89	69.07	69.25	69.42	69.60	69.78	69.95	70.13	70.31	70.48	70.66	70.84
700	79.75	79.96	80.17	80.37	80.58	80.79	80.99	81.20	81.41	81.61	81.82	82.02	82.23	82.44	82.64
800	91.15	91.38	91.62	91.86	92.09	92.33	92.56	92.80	93.03	93.27	93.51	93.74	93.98	94.21	94.45
900	102.54	102.81	103.07	103.34	103.60	103.87	104.13	104.40	104.66	104.93	105.19	105.46	105.73	105.99	106.26

6°

15'	16'	17'	18'	19'	20'	21'	22'	23'	24'	25'	26'	27'	28'	29'	30'
10.952	10.981	11.011	11.040	11.070	11.099	11.128	11.158	11.187	11.217	11.246	11.276	11.305	11.335	11.364	11.394
21.904	21.962	22.021	22.080	22.139	22.198	22.257	22.316	22.375	22.434	22.493	22.551	22.610	22.669	22.728	22.787
32.855	32.944	33.032	33.12	33.209	33.297	33.385	33.474	33.562	33.650	33.739	33.827	33.915	34.004	34.092	34.181
43.807	43.925	44.043	44.160	44.278	44.396	44.514	44.632	44.749	44.867	44.985	45.103	45.221	45.339	45.456	45.574
54.759	54.906	55.053	55.201	55.348	55.495	55.642	55.789	55.937	56.084	56.231	56.379	56.526	56.673	56.820	56.968
65.71	65.89	66.06	66.24	66.42	66.59	66.77	66.95	67.12	67.30	67.48	67.65	67.83	68.01	68.18	68.36
76.66	76.87	77.07	77.28	77.49	77.69	77.90	78.11	78.31	78.52	78.72	78.93	79.14	79.34	79.55	79.75
87.61	87.85	88.09	88.32	88.56	88.79	89.03	89.26	89.50	89.73	89.97	90.21	90.44	90.68	90.91	91.15
98.57	98.83	99.10	99.36	99.63	99.89	100.16	100.42	100.69	100.95	101.22	101.48	101.75	102.01	102.28	102.54

45'	46'	47'	48'	49'	50'	51'	52'	53'	54'	55'	56'	57'	58'	59'	60'
11.836	11.865	11.895	11.924	11.954	11.983	12.013	12.042	12.072	12.101	12.131	12.160	12.190	12.219	12.249	12.278
23.672	23.731	23.790	23.849	23.908	23.967	24.026	24.085	24.144	24.203	24.262	24.321	24.380	24.439	24.498	24.557
35.507	35.596	35.684	35.773	35.861	35.950	36.038	36.127	36.215	36.304	36.393	36.481	36.570	36.658	36.747	36.835
47.343	47.461	47.579	47.697	47.815	47.933	48.051	48.169	48.287	48.405	48.523	48.641	48.760	48.878	48.996	49.114
59.179	59.326	59.474	59.621	59.769	59.916	60.064	60.212	60.359	60.507	60.654	60.802	60.949	61.097	61.245	61.392
71.01	71.19	71.37	71.55	71.72	71.90	72.08	72.25	72.43	72.61	72.79	72.96	73.14	73.32	73.49	73.67
82.85	83.06	83.26	83.47	83.68	83.88	84.09	84.30	84.50	84.71	84.92	85.12	85.33	85.54	85.74	85.95
94.69	94.92	95.16	95.39	95.63	95.87	96.10	96.34	96.57	96.81	97.05	97.28	97.52	97.76	97.99	98.23
106.52	106.79	107.05	107.32	107.58	107.85	108.12	108.38	108.65	108.91	109.18	109.44	109.71	109.97	110.24	110.51

分	0'	1'	2'	3'	4'	5'	6'	7'	8'	9'	10'	11'	12'	13'	14'
D															
100	12.278	12.308	12.338	12.367	12.397	12.426	12.456	12.485	12.515	12.544	12.574	12.603	12.633	12.662	12.692
200	24.557	24.616	24.675	24.734	24.793	24.852	24.911	24.970	25.029	25.089	25.148	25.207	25.266	25.325	25.384
300	36.835	36.924	37.013	37.101	37.190	37.278	37.367	37.456	37.544	37.633	37.722	37.810	37.899	37.987	38.076
400	49.114	49.232	49.350	49.468	49.586	49.704	49.823	49.941	50.059	50.177	50.295	50.414	50.532	50.650	50.768
500	61.392	61.540	61.688	61.835	61.983	62.131	62.278	62.426	62.574	62.721	62.869	63.017	63.165	63.312	63.460
600	73.67	73.85	74.03	74.20	74.38	74.56	74.73	74.91	75.09	75.27	75.44	75.62	75.80	75.97	76.15
700	85.95	86.16	86.36	86.57	86.78	86.98	87.19	87.40	87.60	87.81	88.02	88.22	88.43	88.64	88.84
800	98.23	98.46	98.70	98.94	99.17	99.41	99.65	99.88	100.12	100.35	100.59	100.83	101.06	101.30	101.54
900	110.51	110.77	111.04	111.30	111.57	111.84	112.10	112.37	112.63	112.90	113.15	113.43	113.70	113.96	114.23

分	30'	31'	32'	33'	34'	35'	36'	37'	38'	39'	40'	41'	42'	43'	44'
D															
100	13.165	13.195	13.224	13.254	13.284	13.313	13.343	13.372	13.402	13.432	13.461	13.491	13.521	13.550	13.580
200	26.330	26.390	26.449	26.508	26.567	26.626	26.686	26.745	26.804	26.863	26.923	26.982	27.041	27.100	27.160
300	39.496	39.585	39.673	39.762	39.851	39.940	40.029	40.117	40.206	40.295	40.384	40.473	40.562	40.650	40.739
400	52.661	52.779	52.898	53.016	53.135	53.253	53.371	53.490	53.608	53.727	53.845	53.964	54.082	54.201	54.319
500	65.826	65.974	66.122	66.270	66.418	66.566	66.714	66.862	67.010	67.158	67.306	67.455	67.603	67.751	67.899
600	78.99	79.17	79.35	79.52	79.70	79.88	80.06	80.23	80.41	80.59	80.77	80.95	81.12	81.30	81.48
700	92.16	92.36	92.57	92.78	92.99	93.19	93.40	93.61	93.81	94.02	94.23	94.44	94.64	94.85	95.06
800	105.32	105.56	105.80	106.03	106.27	106.51	106.74	106.98	107.22	107.45	107.69	107.93	108.16	108.40	108.64
900	118.49	118.75	119.02	119.29	119.55	119.82	120.09	120.35	120.62	120.89	121.15	121.42	121.68	121.95	122.22