

São tabulados para zero hora TU de cada dia :

- a) Tempo Sideral Aparente (ou verdadeiro) de Greenwich
- b) Tempo Sideral Médio (ou uniforme) de Greenwich
- c) Termo de longo e curto período da equação dos equinócios
(nutação em ascensão reta)
- d) Obliquidade da Eclíptica
- e) Termos de longo e curto período da nutação em obliquidade
- f) Termos de longo e curto período da nutação em longitude

A nutação é calculada com base na Teoria de E.W.Woolard, cuja expressões são dadas no volume Improved Lunar Ephemeris 1952-1959, 1954.

Os termos de curto período (menores que 35 dias) da nutação em obliquidade e em longitude são utilizados na correção às posições aparentes das estrelas não polares (Seção E).

A fim de que a hora e o minuto dos Tempos Siderais Médio e Aparente sejam comuns, os segundos podem ultrapassar o valor de 60. O grau e o minuto da obliquidade da eclíptica são dados no alto da coluna em cada página.

Para se obter o Tempo Sideral Local para uma determinada Hora Legal (HL) deve-se:

1) Passar o instante em HL para Tempo Universal (TU) através da relação :

$$TU = HL + FUSO$$

onde o FUSO do lugar pode ser encontrado nas páginas deste volume referentes ao Serviço da Hora.

2) Converter o intervalo de tempo TU desde a zero hora TU para intervalo de Tempo Sideral, utilizando para isso as tabelas da Seção G.

3) Somar essa quantidade ao Tempo Sideral de Greenwich a zero hora TU obtendo-se, dessa forma o Tempo Sideral em Greenwich para o instante considerado.

4) Finalmente, para se ter o Tempo Sideral Local basta agora subtrair (ou somar) a longitude oeste (ou leste) do Tempo Sideral em Greenwich.

TEMPO SIDERAL, OBLIQUIDADE DA ECLÍPTICA E NUTAÇÃO, 2017
O HORA TEMPO UNIVERSAL

3 F

DATA H O TU	TEMPO SIDERAL				EQ. EQUIN. PERÍODO		OBLIQ. ECLIP. G ' 23 26	NUT. OBLIQ. PERÍODO		NUT. LONG. PERÍODO	
	APARENTE		MÉDIO		LONGO	CURTO	LONGO	CURTO	LONGO	CURTO	
	H	M	S	S	S	S	"	"	"	"	
JAN. 0	6	39	24.059	24.461	-0.407	+0.006	4.369	-9.034	-0.044	-6.657	+0.092
1	6	43	20.618	21.016	-0.405	+0.007	4.407	-9.023	-0.016	-6.626	+0.118
2	6	47	17.175	17.572	-0.403	+0.007	4.449	-9.012	+0.016	-6.596	+0.113
3	6	51	13.730	14.127	-0.402	+0.005	4.489	-9.000	+0.046	-6.567	+0.076
4	6	55	10.283	10.682	-0.400	+0.001	4.521	-8.987	+0.066	-6.538	+0.013
5	6	59	6.835	7.238	-0.398	-0.004	4.540	-8.973	+0.073	-6.510	-0.065
6	7	3	3.388	3.793	-0.397	-0.009	4.543	-8.960	+0.063	-6.482	-0.141
7	7	6	59.942	60.348	-0.395	-0.012	4.530	-8.945	+0.037	-6.456	-0.195
8	7	10	56.498	56.904	-0.393	-0.013	4.509	-8.930	+0.001	-6.430	-0.211
9	7	14	53.056	53.459	-0.392	-0.011	4.486	-8.914	-0.036	-6.406	-0.178
10	7	18	49.618	50.014	-0.390	-0.006	4.472	-8.898	-0.065	-6.382	-0.102
11	7	22	46.181	46.570	-0.389	+0.000	4.475	-8.881	-0.077	-6.360	+0.001
12	7	26	42.744	43.125	-0.388	+0.006	4.498	-8.863	-0.070	-6.339	+0.105
13	7	30	39.305	39.681	-0.386	+0.011	4.539	-8.845	-0.046	-6.318	+0.187
14	7	34	35.865	36.236	-0.385	+0.014	4.591	-8.827	-0.012	-6.299	+0.228
15	7	38	32.421	32.791	-0.384	+0.014	4.644	-8.808	+0.024	-6.282	+0.225
16	7	42	28.975	29.347	-0.383	+0.011	4.691	-8.788	+0.052	-6.265	+0.182
17	7	46	25.527	25.902	-0.382	+0.007	4.726	-8.769	+0.069	-6.250	+0.114
18	7	50	22.078	22.457	-0.381	+0.002	4.748	-8.748	+0.072	-6.236	+0.035
19	7	54	18.630	19.013	-0.381	-0.002	4.757	-8.728	+0.062	-6.224	-0.041
20	7	58	15.182	15.568	-0.380	-0.006	4.757	-8.707	+0.042	-6.213	-0.101
21	8	2	11.736	12.123	-0.379	-0.008	4.750	-8.685	+0.015	-6.204	-0.138
22	8	6	8.291	8.679	-0.379	-0.009	4.741	-8.663	-0.015	-6.196	-0.147
23	8	10	4.848	5.234	-0.379	-0.008	4.735	-8.641	-0.041	-6.189	-0.130
24	8	14	1.406	1.790	-0.378	-0.005	4.737	-8.619	-0.061	-6.184	-0.089
25	8	17	57.965	58.345	-0.378	-0.002	4.749	-8.596	-0.070	-6.181	-0.033
26	8	21	54.524	54.900	-0.378	+0.002	4.773	-8.573	-0.067	-6.179	+0.029
27	8	25	51.083	51.456	-0.378	+0.005	4.810	-8.550	-0.052	-6.179	+0.084
28	8	29	47.640	48.011	-0.378	+0.007	4.858	-8.527	-0.026	-6.180	+0.120
29	8	33	44.196	44.566	-0.378	+0.008	4.913	-8.504	+0.006	-6.183	+0.127
30	8	37	40.749	41.122	-0.378	+0.006	4.967	-8.480	+0.038	-6.187	+0.101
31	8	41	37.301	37.677	-0.379	+0.003	5.013	-8.457	+0.063	-6.194	+0.044
FEV. 1	8	45	33.851	34.233	-0.379	-0.002	5.046	-8.433	+0.073	-6.202	-0.032
2	8	49	30.401	30.788	-0.380	-0.007	5.063	-8.409	+0.067	-6.211	-0.109
3	8	53	26.952	27.343	-0.381	-0.010	5.064	-8.385	+0.045	-6.222	-0.170
4	8	57	23.505	23.899	-0.381	-0.012	5.053	-8.361	+0.012	-6.235	-0.197
5	9	1	20.061	20.454	-0.382	-0.011	5.039	-8.338	-0.024	-6.249	-0.182
6	9	5	16.618	17.009	-0.383	-0.008	5.031	-8.314	-0.055	-6.266	-0.124
7	9	9	13.178	13.565	-0.384	-0.002	5.035	-8.290	-0.073	-6.283	-0.036
8	9	13	9.738	10.120	-0.386	+0.004	5.057	-8.266	-0.074	-6.303	+0.063
9	9	17	6.298	6.675	-0.387	+0.009	5.097	-8.243	-0.056	-6.324	+0.150
10	9	21	2.855	3.231	-0.388	+0.013	5.150	-8.219	-0.026	-6.346	+0.206

DATA H O TU	TEMPO SIDERAL			EQ. EQUIN. PERÍODO		OBLIQ. ECLIP. G ' 23 26	NUT. OBLIQ. PERÍODO		NUT. LONG. PERÍODO		
	APARENTE		MÉDIO	LONGO	CURTO		LONGO	CURTO	LONGO	CURTO	
	H	M	S	S	S	S	"	"	"	"	
FEV.10	9	21	2.855	3.231	-0.388	+0.013	5.150	-8.219	-0.026	-6.346	+0.206
11	9	24	59.410	59.786	-0.390	+0.013	5.207	-8.196	+0.010	-6.371	+0.220
12	9	28	55.962	56.342	-0.391	+0.012	5.261	-8.173	+0.042	-6.396	+0.192
13	9	32	52.512	52.897	-0.393	+0.008	5.304	-8.150	+0.064	-6.424	+0.133
14	9	36	49.061	49.452	-0.395	+0.003	5.334	-8.128	+0.072	-6.453	+0.057
15	9	40	45.610	46.008	-0.397	-0.001	5.350	-8.105	+0.067	-6.483	-0.021
16	9	44	42.159	42.563	-0.399	-0.005	5.354	-8.083	+0.050	-6.515	-0.088
17	9	48	38.710	39.118	-0.401	-0.008	5.349	-8.062	+0.025	-6.548	-0.133
18	9	52	35.262	35.674	-0.403	-0.009	5.340	-8.040	-0.004	-6.583	-0.151
19	9	56	31.816	32.229	-0.405	-0.009	5.331	-8.019	-0.032	-6.619	-0.142
20	10	0	28.371	28.784	-0.407	-0.007	5.328	-7.998	-0.055	-6.657	-0.109
21	10	4	24.927	25.340	-0.410	-0.003	5.334	-7.978	-0.068	-6.696	-0.057
22	10	8	21.483	21.895	-0.412	+0.000	5.351	-7.958	-0.070	-6.736	+0.004
23	10	12	18.040	18.451	-0.415	+0.004	5.381	-7.939	-0.059	-6.778	+0.062
24	10	16	14.595	15.006	-0.417	+0.007	5.421	-7.920	-0.036	-6.821	+0.107
25	10	20	11.149	11.561	-0.420	+0.008	5.469	-7.901	-0.005	-6.865	+0.126
26	10	24	7.701	8.117	-0.423	+0.007	5.519	-7.883	+0.028	-6.910	+0.113
27	10	28	4.251	4.672	-0.425	+0.004	5.564	-7.865	+0.057	-6.956	+0.067
28	10	32	0.799	1.227	-0.428	-0.000	5.596	-7.848	+0.073	-7.004	-0.004
MAR. 1	10	35	57.346	57.783	-0.431	-0.005	5.610	-7.832	+0.072	-7.052	-0.083
2	10	39	53.895	54.338	-0.434	-0.009	5.607	-7.816	+0.054	-7.102	-0.149
3	10	43	50.445	50.894	-0.437	-0.011	5.589	-7.800	+0.022	-7.152	-0.184
4	10	47	46.997	47.449	-0.441	-0.011	5.566	-7.786	-0.015	-7.203	-0.177
5	10	51	43.553	44.004	-0.444	-0.008	5.546	-7.771	-0.048	-7.255	-0.128
6	10	55	40.110	40.560	-0.447	-0.003	5.537	-7.758	-0.069	-7.308	-0.048
7	10	59	36.667	37.115	-0.450	+0.003	5.544	-7.744	-0.074	-7.362	+0.046
8	11	3	33.225	33.670	-0.454	+0.008	5.568	-7.732	-0.061	-7.416	+0.132
9	11	7	29.781	30.226	-0.457	+0.012	5.605	-7.720	-0.035	-7.471	+0.194
10	11	11	26.334	26.781	-0.460	+0.013	5.648	-7.709	-0.001	-7.527	+0.218
11	11	15	22.885	23.336	-0.464	+0.012	5.691	-7.698	+0.032	-7.583	+0.202
12	11	19	19.434	19.892	-0.467	+0.009	5.725	-7.688	+0.058	-7.640	+0.152
13	11	23	15.981	16.447	-0.471	+0.005	5.747	-7.679	+0.071	-7.697	+0.080
14	11	27	12.528	13.003	-0.474	+0.000	5.753	-7.670	+0.070	-7.754	+0.000
15	11	31	9.076	9.558	-0.478	-0.004	5.747	-7.663	+0.057	-7.812	-0.072
16	11	35	5.624	6.113	-0.481	-0.008	5.730	-7.655	+0.034	-7.870	-0.125
17	11	39	2.174	2.669	-0.485	-0.009	5.707	-7.649	+0.006	-7.928	-0.152
18	11	42	58.726	59.224	-0.489	-0.009	5.682	-7.643	-0.023	-7.987	-0.152
19	11	46	55.280	55.779	-0.492	-0.008	5.662	-7.637	-0.048	-8.045	-0.127
20	11	50	51.834	52.335	-0.496	-0.005	5.648	-7.633	-0.065	-8.104	-0.081
21	11	54	48.389	48.890	-0.499	-0.001	5.645	-7.629	-0.071	-8.163	-0.023
22	11	58	44.945	45.445	-0.503	+0.002	5.654	-7.625	-0.064	-8.221	+0.035
23	12	2	41.500	42.001	-0.506	+0.005	5.674	-7.623	-0.046	-8.280	+0.084

TEMPO SIDERAL, OBLIQUIDADE DA ECLÍPTICA E NUTAÇÃO, 2017
O HORA TEMPO UNIVERSAL

5 F

DATA H O TU	TEMPO SIDERAL			EQ. EQUIN. PERÍODO		OBLIQ. ECLIP. G ' 23 26	NUT. OBLIQ. PERÍODO		NUT. LONG. PERÍODO		
	APARENTE			MÉDIO	LONGO	CURTO	LONGO	CURTO	LONGO	CURTO	
	H	M	S	S	S	S	"	"	"	"	
MAR. 23	12	2	41.500	42.001	-0.506	+0.005	5.674	-7.623	-0.046	-8.280	+0.084
	24	12	6 38.053	38.556	-0.510	+0.007	5.702	-7.621	-0.018	-8.338	+0.113
	25	12	10 34.605	35.112	-0.514	+0.007	5.735	-7.619	+0.015	-8.396	+0.112
	26	12	14 31.155	31.667	-0.517	+0.005	5.766	-7.619	+0.047	-8.454	+0.079
	27	12	18 27.703	28.222	-0.521	+0.001	5.787	-7.619	+0.069	-8.512	+0.016
	28	12	22 24.250	24.778	-0.524	-0.004	5.792	-7.619	+0.075	-8.569	-0.062
	29	12	26 20.797	21.333	-0.528	-0.008	5.777	-7.621	+0.063	-8.625	-0.136
	30	12	30 17.346	17.888	-0.531	-0.011	5.745	-7.622	+0.034	-8.682	-0.182
	31	12	34 13.898	14.444	-0.534	-0.011	5.703	-7.625	-0.004	-8.737	-0.186
ABR. 1	12	38	10.453	10.999	-0.538	-0.009	5.662	-7.628	-0.040	-8.793	-0.143
	2	12	42 7.009	7.554	-0.541	-0.004	5.632	-7.632	-0.066	-8.847	-0.063
	3	12	46 3.567	4.110	-0.544	+0.002	5.617	-7.636	-0.074	-8.901	+0.034
	4	12	50 0.125	0.665	-0.548	+0.008	5.620	-7.641	-0.066	-8.954	+0.126
	5	12	53 56.682	57.221	-0.551	+0.012	5.637	-7.646	-0.042	-9.007	+0.194
	6	12	57 53.236	53.776	-0.554	+0.014	5.662	-7.652	-0.010	-9.059	+0.226
	7	13	1 49.788	50.331	-0.557	+0.013	5.688	-7.659	+0.024	-9.109	+0.219
	8	13	5 46.337	46.887	-0.560	+0.011	5.708	-7.666	+0.052	-9.159	+0.175
	9	13	9 42.885	43.442	-0.563	+0.007	5.716	-7.673	+0.069	-9.208	+0.107
	10	13	13 39.433	39.997	-0.566	+0.002	5.710	-7.681	+0.073	-9.256	+0.027
	11	13	17 35.981	36.553	-0.569	-0.003	5.691	-7.690	+0.063	-9.304	-0.049
	12	13	21 32.530	33.108	-0.572	-0.007	5.660	-7.699	+0.042	-9.350	-0.110
	13	13	25 29.080	29.664	-0.575	-0.009	5.622	-7.708	+0.015	-9.395	-0.146
	14	13	29 25.632	26.219	-0.577	-0.010	5.581	-7.718	-0.014	-9.439	-0.155
	15	13	33 22.186	22.774	-0.580	-0.008	5.543	-7.728	-0.041	-9.481	-0.138
	16	13	37 18.741	19.330	-0.582	-0.006	5.512	-7.739	-0.061	-9.523	-0.098
	17	13	41 15.297	15.885	-0.585	-0.003	5.490	-7.750	-0.070	-9.563	-0.044
	18	13	45 11.854	12.440	-0.587	+0.001	5.480	-7.761	-0.068	-9.603	+0.014
	19	13	49 8.410	8.996	-0.590	+0.004	5.481	-7.773	-0.053	-9.640	+0.065
	20	13	53 4.965	5.551	-0.592	+0.006	5.492	-7.785	-0.029	-9.677	+0.098
	21	13	57 1.519	2.106	-0.594	+0.007	5.510	-7.797	+0.002	-9.713	+0.107
	22	14	0 58.071	58.662	-0.596	+0.005	5.528	-7.810	+0.034	-9.747	+0.084
	23	14	4 54.621	55.217	-0.598	+0.002	5.541	-7.822	+0.061	-9.779	+0.032
	24	14	8 51.170	51.773	-0.600	-0.003	5.540	-7.835	+0.075	-9.811	-0.043
	25	14	12 47.719	48.328	-0.602	-0.007	5.521	-7.849	+0.070	-9.841	-0.122
	26	14	16 44.268	44.883	-0.604	-0.011	5.484	-7.862	+0.048	-9.870	-0.183
	27	14	20 40.821	41.439	-0.605	-0.013	5.432	-7.876	+0.011	-9.897	-0.205
	28	14	24 37.376	37.994	-0.607	-0.011	5.378	-7.890	-0.029	-9.923	-0.176
	29	14	28 33.935	34.549	-0.608	-0.006	5.330	-7.904	-0.061	-9.947	-0.101
	30	14	32 30.495	31.105	-0.610	+0.000	5.300	-7.918	-0.076	-9.970	+0.002
MAIO 1	14	36	27.056	27.660	-0.611	+0.007	5.288	-7.932	-0.072	-9.992	+0.107
	2	14	40 23.615	24.215	-0.612	+0.012	5.294	-7.946	-0.050	-10.012	+0.190
	3	14	44 20.172	20.771	-0.614	+0.014	5.311	-7.960	-0.018	-10.031	+0.236

DATA	TEMPO SIDERAL				EQ. EQUIN. PERÍODO		OBLIQ. ECLIP.	NUT. OBLIQ. PERÍODO		NUT. LONG. PERÍODO		
	APARENTE		MÉDIO		LONGO	CURTO	G ' 23 26	LONGO	CURTO	LONGO	CURTO	
	H	M	S	S	S	S	"	"	"	"		
MAIO	1	14	36	27.056	27.660	-0.611	+0.007	5.288	-7.932	-0.072	-9.992	+1.107
	2	14	40	23.615	24.215	-0.612	+0.012	5.294	-7.946	-0.050	-10.012	+1.190
	3	14	44	20.172	20.771	-0.614	+0.014	5.311	-7.960	-0.018	-10.031	+2.236
	4	14	48	16.726	17.326	-0.615	+0.015	5.330	-7.974	+0.017	-10.048	+2.238
	5	14	52	13.278	13.882	-0.616	+0.012	5.345	-7.989	+0.047	-10.064	+2.202
	6	14	56	9.829	10.437	-0.616	+0.008	5.350	-8.003	+0.067	-10.078	+1.138
	7	15	0	6.379	6.992	-0.617	+0.004	5.341	-8.017	+0.074	-10.091	+0.059
	8	15	4	2.928	3.548	-0.618	-0.001	5.319	-8.031	+0.068	-10.103	-0.021
	9	15	7	59.479	60.103	-0.619	-0.005	5.286	-8.045	+0.050	-10.113	-0.087
	10	15	11	56.031	56.658	-0.619	-0.008	5.245	-8.059	+0.024	-10.121	-1.132
	11	15	15	52.585	53.214	-0.620	-0.009	5.200	-8.073	-0.006	-10.129	-1.150
	12	15	19	49.141	49.769	-0.620	-0.009	5.157	-8.087	-0.034	-10.134	-1.140
	13	15	23	45.698	46.325	-0.620	-0.007	5.120	-8.100	-0.056	-10.139	-1.106
	14	15	27	42.256	42.880	-0.620	-0.003	5.093	-8.114	-0.069	-10.142	-0.056
	15	15	31	38.815	39.435	-0.620	+0.000	5.077	-8.127	-0.070	-10.144	+0.001
	16	15	35	35.373	35.991	-0.620	+0.003	5.074	-8.140	-0.059	-10.144	+0.053
	17	15	39	31.931	32.546	-0.620	+0.006	5.081	-8.152	-0.038	-10.143	+0.091
	18	15	43	28.488	29.101	-0.620	+0.006	5.096	-8.165	-0.009	-10.141	+1.106
	19	15	47	25.042	25.657	-0.620	+0.006	5.114	-8.177	+0.022	-10.138	+0.092
	20	15	51	21.595	22.212	-0.620	+0.003	5.130	-8.189	+0.051	-10.133	+0.048
	21	15	55	18.147	18.767	-0.619	-0.001	5.136	-8.200	+0.070	-10.127	-0.021
	22	15	59	14.698	15.323	-0.619	-0.006	5.127	-8.211	+0.073	-10.120	-1.102
	23	16	3	11.249	11.878	-0.618	-0.011	5.100	-8.222	+0.059	-10.111	-1.175
	24	16	7	7.802	8.434	-0.618	-0.013	5.057	-8.233	+0.027	-10.102	-2.218
	25	16	11	4.359	4.989	-0.617	-0.013	5.006	-8.243	-0.013	-10.091	-2.212
	26	16	15	0.918	1.544	-0.617	-0.009	4.957	-8.253	-0.050	-10.080	-1.154
	27	16	18	57.481	58.100	-0.616	-0.003	4.922	-8.262	-0.075	-10.067	-0.055
	28	16	22	54.044	54.655	-0.615	+0.004	4.908	-8.271	-0.079	-10.053	+0.060
	29	16	26	50.606	51.210	-0.614	+0.010	4.915	-8.279	-0.062	-10.038	+1.162
	30	16	30	47.167	47.766	-0.613	+0.014	4.937	-8.287	-0.031	-10.023	+2.229
31	16	34	43.724	44.321	-0.612	+0.015	4.965	-8.294	+0.006	-10.006	+2.250	
JUN.	1	16	38	40.279	40.876	-0.611	+0.014	4.991	-8.301	+0.040	-9.988	+2.226
	2	16	42	36.832	37.432	-0.610	+0.010	5.007	-8.308	+0.064	-9.970	+1.168
	3	16	46	33.384	33.987	-0.609	+0.006	5.011	-8.314	+0.075	-9.951	+0.091
	4	16	50	29.936	30.543	-0.607	+0.001	5.001	-8.319	+0.072	-9.931	+0.010
	5	16	54	26.488	27.098	-0.606	-0.004	4.979	-8.324	+0.057	-9.910	-0.062
	6	16	58	23.042	23.653	-0.605	-0.007	4.949	-8.329	+0.032	-9.888	-1.113
	7	17	2	19.597	20.209	-0.603	-0.008	4.915	-8.333	+0.003	-9.866	-1.139
	8	17	6	16.154	16.764	-0.602	-0.008	4.881	-8.336	-0.026	-9.844	-1.136
	9	17	10	12.712	13.319	-0.601	-0.007	4.853	-8.339	-0.051	-9.820	-1.109
	10	17	14	9.272	9.875	-0.599	-0.004	4.833	-8.341	-0.067	-9.797	-0.062
	11	17	18	5.832	6.430	-0.598	-0.000	4.826	-8.342	-0.071	-9.772	-0.006

TEMPO SIDERAL, OBLIQUIDADE DA ECLÍPTICA E NUTAÇÃO, 2017
O HORA TEMPO UNIVERSAL

7 F

DATA H O TU	TEMPO SIDERAL		EQ. EQUIN. PERÍODO		OBLIQ. ECLIP. G ' 23 26	NUT. OBLIQ. PERÍODO		NUT. LONG. PERÍODO			
	APARENTE	MÉDIO	LONGO	CURTO		LONGO	CURTO	LONGO	CURTO		
	H M S	S	S	S	" "	" "	" "	" "			
JUN.11	17	18	5.832	6.430	-0.598	-.000	4.826	-8.342	-.071	-9.772	-.006
	12	17	2.392	2.986	-0.596	+0.003	4.831	-8.343	-.064	-9.747	+0.049
	13	17	25.58.952	59.541	-0.595	+0.006	4.848	-8.344	-.045	-9.722	+0.092
	14	17	29.55.510	56.096	-0.593	+0.007	4.874	-8.343	-.018	-9.697	+0.112
	15	17	33.52.066	52.652	-0.592	+0.006	4.904	-8.343	+0.013	-9.671	+0.105
	16	17	37.48.621	49.207	-0.590	+0.004	4.934	-8.341	+0.042	-9.645	+0.068
	17	17	41.45.174	45.762	-0.588	+0.000	4.956	-8.339	+0.064	-9.619	+0.005
	18	17	45.41.726	42.318	-0.587	-.005	4.966	-8.337	+0.073	-9.592	-.074
	19	17	49.38.279	38.873	-0.585	-.009	4.961	-8.333	+0.065	-9.566	-.154
	20	17	53.34.832	35.428	-0.583	-.013	4.939	-8.329	+0.041	-9.539	-.213
	21	17	57.31.388	31.984	-0.582	-.014	4.906	-8.325	+0.004	-9.512	-.232
	22	18	1.27.947	28.539	-0.580	-.012	4.870	-8.320	-.036	-9.486	-.199
	23	18	5.24.509	25.095	-0.579	-.007	4.843	-8.314	-.067	-9.459	-.118
	24	18	9.21.073	21.650	-0.577	-.000	4.834	-8.308	-.081	-9.433	-.006
	25	18	13.17.637	18.205	-0.575	+0.007	4.847	-8.301	-.073	-9.406	+0.109
	26	18	17.14.199	14.761	-0.574	+0.012	4.880	-8.293	-.047	-9.380	+0.198
	27	18	21.10.759	11.316	-0.572	+0.015	4.924	-8.285	-.010	-9.354	+0.243
	28	18	25.7.315	7.871	-0.571	+0.015	4.970	-8.276	+0.028	-9.329	+0.238
	29	18	29.3.869	4.427	-0.569	+0.012	5.007	-8.267	+0.058	-9.303	+0.193
	30	18	33.0.422	0.982	-0.568	+0.007	5.032	-8.257	+0.074	-9.278	+0.121
JUL. 1	18	36	56.974	57.537	-0.566	+0.002	5.043	-8.246	+0.076	-9.254	+0.039
	2	18	40.53.526	54.093	-0.565	-.002	5.041	-8.235	+0.064	-9.230	-.037
	3	18	44.50.079	50.648	-0.563	-.006	5.029	-8.224	+0.041	-9.206	-.095
	4	18	48.46.634	47.204	-0.562	-.008	5.011	-8.211	+0.012	-9.183	-.128
	5	18	52.43.190	43.759	-0.560	-.008	4.992	-8.198	-.018	-9.161	-.133
	6	18	56.39.749	40.314	-0.559	-.007	4.978	-8.185	-.044	-9.139	-.111
	7	19	0.36.308	36.870	-0.558	-.004	4.972	-8.171	-.063	-9.118	-.068
	8	19	4.32.868	33.425	-0.556	-.001	4.977	-8.157	-.071	-9.097	-.013
	9	19	8.29.428	29.980	-0.555	+0.003	4.995	-8.142	-.067	-9.078	+0.044
	10	19	12.25.987	26.536	-0.554	+0.006	5.025	-8.126	-.051	-9.059	+0.092
	11	19	16.22.545	23.091	-0.553	+0.007	5.065	-8.110	-.025	-9.041	+0.120
	12	19	20.19.102	19.647	-0.552	+0.007	5.111	-8.094	+0.005	-9.024	+0.121
	13	19	24.15.656	16.202	-0.551	+0.006	5.157	-8.077	+0.035	-9.007	+0.091
	14	19	28.12.209	12.757	-0.550	+0.002	5.196	-8.060	+0.059	-8.992	+0.033
	15	19	32.8.761	9.313	-0.549	-.003	5.225	-8.042	+0.071	-8.977	-.043
	16	19	36.5.312	5.868	-0.548	-.008	5.239	-8.023	+0.068	-8.964	-.124
	17	19	40.1.864	2.423	-0.548	-.012	5.237	-8.005	+0.049	-8.951	-.192
	18	19	43.58.418	58.979	-0.547	-.014	5.223	-7.986	+0.017	-8.940	-.228
	19	19	47.54.974	55.534	-0.546	-.013	5.203	-7.966	-.021	-8.930	-.219
	20	19	51.51.534	52.089	-0.546	-.010	5.187	-7.946	-.056	-8.921	-.161
	21	19	55.48.096	48.645	-0.545	-.004	5.185	-7.926	-.077	-8.913	-.064
	22	19	59.44.658	45.200	-0.545	+0.003	5.202	-7.906	-.079	-8.906	+0.049

DATA H O TU	TEMPO SIDERAL			EQ. EQUIN. PERÍODO		OBLIQ. ECLIP.	NUT. OBLIQ. PERÍODO		NUT. LONG. PERÍODO		
	APARENTE		MÉDIO	LONGO	CURTO	G ' 23 26	LONGO	CURTO	LONGO	CURTO	
	H	M	S	S	S	"	"	"	"	"	
JUL. 22	19	59	44.658	45.200	-0.545	+0.003	5.202	-7.906	-0.079	-8.906	+0.049
23	20	3	41.220	41.756	-0.544	+0.009	5.240	-7.885	-0.061	-8.900	+0.151
24	20	7	37.780	38.311	-0.544	+0.013	5.294	-7.864	-0.027	-8.896	+0.217
25	20	11	34.337	34.866	-0.544	+0.014	5.353	-7.842	+0.013	-8.892	+0.235
26	20	15	30.890	31.422	-0.544	+0.013	5.409	-7.820	+0.047	-8.890	+0.207
27	20	19	27.442	27.977	-0.544	+0.009	5.452	-7.798	+0.070	-8.890	+0.144
28	20	23	23.993	24.532	-0.544	+0.004	5.480	-7.776	+0.078	-8.890	+0.064
29	20	27	20.543	21.088	-0.544	-0.001	5.494	-7.754	+0.070	-8.892	-0.015
30	20	31	17.094	17.643	-0.544	-0.005	5.495	-7.731	+0.050	-8.895	-0.079
31	20	35	13.647	14.198	-0.544	-0.007	5.489	-7.708	+0.022	-8.900	-0.120
AGO. 1	20	39	10.201	10.754	-0.545	-0.008	5.480	-7.685	-0.008	-8.906	-0.132
2	20	43	6.757	7.309	-0.545	-0.007	5.474	-7.662	-0.037	-8.913	-0.117
3	20	47	3.314	3.865	-0.546	-0.005	5.474	-7.639	-0.058	-8.922	-0.079
4	20	50	59.872	60.420	-0.546	-0.002	5.485	-7.616	-0.069	-8.932	-0.026
5	20	54	56.430	56.975	-0.547	+0.002	5.508	-7.592	-0.069	-8.943	+0.033
6	20	58	52.988	53.531	-0.548	+0.005	5.543	-7.569	-0.056	-8.956	+0.086
7	21	2	49.545	50.086	-0.549	+0.007	5.588	-7.546	-0.033	-8.970	+0.122
8	21	6	46.100	46.641	-0.550	+0.008	5.640	-7.522	-0.003	-8.986	+0.132
9	21	10	42.653	43.197	-0.551	+0.007	5.693	-7.499	+0.028	-9.003	+0.111
10	21	14	39.204	39.752	-0.552	+0.004	5.742	-7.475	+0.055	-9.021	+0.060
11	21	18	35.754	36.308	-0.553	-0.001	5.779	-7.452	+0.070	-9.041	-0.013
12	21	22	32.303	32.863	-0.554	-0.006	5.802	-7.428	+0.071	-9.062	-0.094
13	21	26	28.852	29.418	-0.556	-0.010	5.808	-7.405	+0.055	-9.084	-0.165
14	21	30	25.404	25.974	-0.557	-0.013	5.802	-7.382	+0.026	-9.108	-0.211
15	21	34	21.957	22.529	-0.559	-0.013	5.787	-7.359	-0.010	-9.133	-0.216
16	21	38	18.513	19.084	-0.560	-0.011	5.774	-7.336	-0.045	-9.160	-0.176
17	21	42	15.072	15.640	-0.562	-0.006	5.770	-7.313	-0.070	-9.188	-0.097
18	21	46	11.632	12.195	-0.564	+0.000	5.782	-7.291	-0.079	-9.217	+0.006
19	21	50	8.191	8.750	-0.566	+0.007	5.814	-7.269	-0.069	-9.248	+0.108
20	21	54	4.750	5.306	-0.568	+0.011	5.862	-7.247	-0.041	-9.280	+0.186
21	21	58	1.305	1.861	-0.570	+0.014	5.920	-7.225	-0.003	-9.313	+0.222
22	22	1	57.858	58.417	-0.572	+0.013	5.978	-7.203	+0.034	-9.347	+0.211
23	22	5	54.408	54.972	-0.574	+0.010	6.027	-7.182	+0.063	-9.383	+0.160
24	22	9	50.956	51.527	-0.576	+0.005	6.060	-7.161	+0.077	-9.420	+0.085
25	22	13	47.504	48.083	-0.579	+0.000	6.077	-7.140	+0.074	-9.458	+0.005
26	22	17	44.053	44.638	-0.581	-0.004	6.080	-7.120	+0.058	-9.497	-0.066
27	22	21	40.603	41.193	-0.583	-0.007	6.073	-7.100	+0.032	-9.538	-0.115
28	22	25	37.155	37.749	-0.586	-0.008	6.061	-7.080	+0.002	-9.579	-0.136
29	22	29	33.708	34.304	-0.589	-0.008	6.049	-7.061	-0.028	-9.622	-0.128
30	22	33	30.262	30.859	-0.591	-0.006	6.042	-7.042	-0.052	-9.665	-0.096
31	22	37	26.818	27.415	-0.594	-0.003	6.045	-7.024	-0.067	-9.710	-0.045
SET. 1	22	41	23.374	23.970	-0.597	+0.001	6.058	-7.006	-0.070	-9.756	+0.013

TEMPO SIDERAL, OBLIQUIDADE DA ECLÍPTICA E NUTAÇÃO, 2017
O HORA TEMPO UNIVERSAL

9 F

DATA H O TU	TEMPO SIDERAL				EQ. EQUIN. PERÍODO		OBLIQ. ECLIP. G ' "	NUT. OBLIQ. PERÍODO		NUT. LONG. PERÍODO	
	APARENTE		MÉDIO		LONGO	CURTO	G	LONGO	CURTO	LONGO	CURTO
	H	M	S	S	S	S	23 26	"	"	"	"
SET. 1	22	41	23.374	23.970	-0.597	+0.001	6.058	-7.006	-0.070	-9.756	+0.013
2	22	45	19.930	20.526	-0.600	+0.004	6.083	-6.988	-0.061	-9.802	+0.070
3	22	49	16.485	17.081	-0.602	+0.007	6.119	-6.971	-0.041	-9.850	+0.113
4	22	53	13.039	13.636	-0.605	+0.008	6.163	-6.955	-0.013	-9.898	+0.132
5	22	57	9.591	10.192	-0.608	+0.007	6.209	-6.939	+0.019	-9.948	+0.122
6	23	1	6.140	6.747	-0.612	+0.005	6.253	-6.923	+0.048	-9.998	+0.081
7	23	5	2.689	3.302	-0.615	+0.001	6.286	-6.908	+0.068	-10.049	+0.014
8	23	8	59.236	59.858	-0.618	-0.004	6.305	-6.894	+0.073	-10.100	-0.066
9	23	12	55.783	56.413	-0.621	-0.009	6.306	-6.880	+0.062	-10.152	-0.142
10	23	16	52.332	52.969	-0.624	-0.012	6.292	-6.866	+0.035	-10.205	-0.194
11	23	20	48.884	49.524	-0.628	-0.013	6.267	-6.854	-0.000	-10.259	-0.208
12	23	24	45.438	46.079	-0.631	-0.011	6.242	-6.841	-0.036	-10.313	-0.178
13	23	28	41.994	42.635	-0.634	-0.007	6.225	-6.830	-0.064	-10.368	-0.108
14	23	32	38.552	39.190	-0.638	-0.001	6.222	-6.819	-0.077	-10.423	-0.013
15	23	36	35.110	35.745	-0.641	+0.005	6.236	-6.808	-0.072	-10.478	+0.085
16	23	40	31.667	32.301	-0.644	+0.010	6.267	-6.798	-0.049	-10.534	+0.167
17	23	44	28.221	28.856	-0.648	+0.013	6.309	-6.789	-0.015	-10.590	+0.212
18	23	48	24.773	25.411	-0.651	+0.013	6.354	-6.781	+0.022	-10.646	+0.215
19	23	52	21.323	21.967	-0.655	+0.011	6.393	-6.773	+0.054	-10.703	+0.175
20	23	56	17.871	18.522	-0.658	+0.007	6.418	-6.765	+0.073	-10.760	+0.107
21	0	0	14.417	15.078	-0.662	+0.002	6.427	-6.759	+0.077	-10.817	+0.025
22	0	4	10.965	11.633	-0.665	-0.003	6.420	-6.753	+0.065	-10.874	-0.051
23	0	8	7.513	8.188	-0.669	-0.007	6.401	-6.747	+0.042	-10.931	-0.108
24	0	12	4.063	4.744	-0.672	-0.008	6.374	-6.742	+0.012	-10.988	-0.139
25	0	16	0.615	1.299	-0.676	-0.009	6.346	-6.738	-0.019	-11.045	-0.140
26	0	19	57.168	57.854	-0.679	-0.007	6.322	-6.735	-0.045	-11.101	-0.114
27	0	23	53.723	54.410	-0.683	-0.004	6.305	-6.732	-0.064	-11.158	-0.069
28	0	27	50.278	50.965	-0.686	-0.001	6.299	-6.730	-0.071	-11.214	-0.011
29	0	31	46.834	47.520	-0.689	+0.003	6.304	-6.728	-0.066	-11.270	+0.047
30	0	35	43.389	44.076	-0.693	+0.006	6.321	-6.727	-0.049	-11.326	+0.095
OUT. 1	0	39	39.943	40.631	-0.696	+0.008	6.345	-6.727	-0.024	-11.381	+0.123
2	0	43	36.495	37.187	-0.700	+0.008	6.375	-6.727	+0.007	-11.436	+0.124
3	0	47	33.045	33.742	-0.703	+0.006	6.403	-6.728	+0.038	-11.491	+0.093
4	0	51	29.593	30.297	-0.706	+0.002	6.425	-6.730	+0.062	-11.545	+0.035
5	0	55	26.141	26.853	-0.709	-0.003	6.433	-6.732	+0.074	-11.598	-0.043
6	0	59	22.688	23.408	-0.713	-0.008	6.424	-6.734	+0.069	-11.650	-0.123
7	1	3	19.236	19.963	-0.716	-0.011	6.396	-6.738	+0.046	-11.702	-0.184
8	1	7	15.787	16.519	-0.719	-0.013	6.356	-6.742	+0.011	-11.754	-0.209
9	1	11	12.341	13.074	-0.722	-0.011	6.312	-6.746	-0.027	-11.804	-0.187
10	1	15	8.897	9.629	-0.725	-0.007	6.274	-6.751	-0.059	-11.854	-0.122
11	1	19	5.455	6.185	-0.728	-0.002	6.249	-6.757	-0.076	-11.902	-0.027
12	1	23	2.014	2.740	-0.731	+0.005	6.243	-6.763	-0.075	-11.950	+0.075

TEMPO SIDERAL, OBLIQUIDADE DA ECLÍPTICA E NUTAÇÃO, 2017
O HORA TEMPO UNIVERSAL

DATA	TEMPO SIDERAL			EQ. EQUIN. PERÍODO		OBLIQ. ECLIP.	NUT. OBLIQ. PERÍODO		NUT. LONG. PERÍODO		
	APARENTE			LONGO	CURTO	G ' "	LONGO	CURTO	LONGO	CURTO	
	H	M	S	S	S	23 26	"	"	"	"	
OUT.12	1	23	2.014	2.740	-0.731	+ .005	6.243	-6.763	-.075	-11.950	+ .075
	13	1	26 58.572	59.296	-0.734	+ .010	6.255	-6.770	-.056	-11.997	+ .161
	14	1	30 55.127	55.851	-0.737	+ .013	6.278	-6.777	-.024	-12.043	+ .215
	15	1	34 51.681	52.406	-0.739	+ .014	6.306	-6.785	+ .013	-12.087	+ .226
	16	1	38 48.232	48.962	-0.742	+ .012	6.330	-6.793	+ .047	-12.131	+ .195
	17	1	42 44.781	45.517	-0.745	+ .008	6.343	-6.802	+ .070	-12.173	+ .132
	18	1	46 41.328	42.072	-0.747	+ .003	6.341	-6.811	+ .078	-12.215	+ .052
	19	1	50 37.876	38.628	-0.750	-.002	6.323	-6.820	+ .071	-12.255	-.028
	20	1	54 34.425	35.183	-0.752	-.006	6.292	-6.830	+ .051	-12.294	-.094
	21	1	58 30.976	31.739	-0.754	-.008	6.252	-6.841	+ .022	-12.331	-.135
	22	2	2 27.528	28.294	-0.756	-.009	6.208	-6.852	-.009	-12.368	-.146
	23	2	6 24.083	24.849	-0.759	-.008	6.167	-6.863	-.038	-12.402	-.128
	24	2	10 20.639	21.405	-0.761	-.005	6.133	-6.874	-.059	-12.436	-.088
	25	2	14 17.195	17.960	-0.763	-.002	6.108	-6.886	-.071	-12.468	-.034
	26	2	18 13.752	14.515	-0.765	+ .001	6.096	-6.898	-.070	-12.499	+ .024
	27	2	22 10.309	11.071	-0.766	+ .005	6.095	-6.910	-.057	-12.528	+ .075
	28	2	26 6.865	7.626	-0.768	+ .007	6.104	-6.923	-.034	-12.556	+ .110
	29	2	30 3.419	4.181	-0.770	+ .007	6.119	-6.936	-.005	-12.582	+ .119
	30	2	33 59.972	60.737	-0.771	+ .006	6.136	-6.949	+ .026	-12.607	+ .099
	31	2	37 56.523	57.292	-0.773	+ .003	6.148	-6.962	+ .053	-12.630	+ .050
NOV. 1	2	41	53.072	53.848	-0.774	-.001	6.151	-6.976	+ .071	-12.651	-.023
	2	45	49.621	50.403	-0.775	-.006	6.138	-6.990	+ .073	-12.671	-.105
	3	2	49 46.171	46.958	-0.776	-.011	6.107	-7.003	+ .057	-12.690	-.177
	4	2	53 42.723	43.514	-0.777	-.013	6.061	-7.017	+ .026	-12.706	-.219
	5	2	57 39.278	40.069	-0.778	-.013	6.006	-7.031	-.014	-12.722	-.213
	6	3	1 35.836	36.624	-0.779	-.010	5.953	-7.045	-.051	-12.735	-.157
	7	3	5 32.396	33.180	-0.780	-.004	5.914	-7.059	-.075	-12.747	-.061
	8	3	9 28.958	29.735	-0.780	+ .003	5.894	-7.073	-.080	-12.757	+ .051
	9	3	13 25.519	26.290	-0.781	+ .009	5.894	-7.087	-.064	-12.766	+ .151
	10	3	17 22.078	22.846	-0.781	+ .013	5.909	-7.101	-.034	-12.773	+ .219
	11	3	21 18.634	19.401	-0.782	+ .015	5.932	-7.115	+ .004	-12.778	+ .242
	12	3	25 15.188	15.957	-0.782	+ .014	5.953	-7.129	+ .040	-12.782	+ .221
	13	3	29 11.740	12.512	-0.782	+ .010	5.964	-7.143	+ .066	-12.784	+ .164
	14	3	33 8.291	9.067	-0.782	+ .005	5.961	-7.156	+ .079	-12.784	+ .085
	15	3	37 4.841	5.623	-0.782	+ .000	5.944	-7.170	+ .075	-12.783	+ .003
	16	3	41 1.392	2.178	-0.782	-.004	5.912	-7.183	+ .059	-12.781	-.069
	17	3	44 57.945	58.733	-0.781	-.007	5.871	-7.196	+ .032	-12.776	-.119
	18	3	48 54.499	55.289	-0.781	-.009	5.826	-7.209	+ .001	-12.770	-.141
	19	3	52 51.055	51.844	-0.781	-.008	5.782	-7.221	-.029	-12.763	-.132
	20	3	56 47.613	48.400	-0.780	-.006	5.744	-7.234	-.054	-12.754	-.099
	21	4	0 44.172	44.955	-0.779	-.003	5.716	-7.246	-.069	-12.744	-.049
	22	4	4 40.732	41.510	-0.779	+ .001	5.700	-7.257	-.072	-12.732	+ .009

TEMPO SIDERAL, OBLIQUIDADE DA ECLÍPTICA E NUTAÇÃO, 2017
O HORA TEMPO UNIVERSAL

11 F

DATA H O TU	TEMPO SIDERAL			EQ. EQUIN. PERÍODO		OBLIQ. ECLIP. G ' 23 26	NUT. OBLIQ. PERÍODO		NUT. LONG. PERÍODO		
	APARENTE		MÉDIO	LONGO	CURTO		LONGO	CURTO	LONGO	CURTO	
	H	M	S	S	S	S	"	"	"	"	
NOV. 22	4	4	40.732	41.510	-0.779	+0.001	5.700	-7.257	-0.072	-12.732	+0.009
23	4	8	37.291	38.066	-0.778	+0.004	5.696	-7.269	-0.063	-12.718	+0.062
24	4	12	33.850	34.621	-0.777	+0.006	5.704	-7.279	-0.043	-12.704	+0.101
25	4	16	30.407	31.176	-0.776	+0.007	5.719	-7.290	-0.016	-12.687	+0.117
26	4	20	26.963	27.732	-0.775	+0.006	5.739	-7.300	+0.015	-12.670	+0.106
27	4	24	23.517	24.287	-0.774	+0.004	5.756	-7.310	+0.043	-12.651	+0.065
28	4	28	20.070	20.842	-0.773	-0.000	5.767	-7.319	+0.064	-12.631	-0.001
29	4	32	16.622	17.398	-0.771	-0.005	5.765	-7.328	+0.073	-12.609	-0.082
30	4	36	13.173	13.953	-0.770	-0.010	5.748	-7.336	+0.065	-12.587	-0.163
DEZ. 1	4	40	9.727	10.509	-0.768	-0.014	5.714	-7.344	+0.040	-12.563	-0.222
2	4	44	6.282	7.064	-0.767	-0.015	5.668	-7.351	+0.003	-12.538	-0.241
3	4	48	2.841	3.619	-0.765	-0.013	5.620	-7.357	-0.037	-12.512	-0.206
4	4	51	59.404	60.175	-0.764	-0.007	5.581	-7.364	-0.069	-12.485	-0.122
5	4	55	55.968	56.730	-0.762	-0.000	5.560	-7.369	-0.083	-12.457	-0.006
6	4	59	52.532	53.285	-0.760	+0.007	5.562	-7.374	-0.075	-12.428	+0.112
7	5	3	49.095	49.841	-0.758	+0.012	5.584	-7.378	-0.048	-12.398	+0.203
8	5	7	45.655	46.396	-0.756	+0.015	5.617	-7.382	-0.009	-12.367	+0.249
9	5	11	42.212	42.951	-0.755	+0.015	5.652	-7.385	+0.030	-12.336	+0.244
10	5	15	38.766	39.507	-0.753	+0.012	5.680	-7.387	+0.061	-12.303	+0.196
11	5	19	35.319	36.062	-0.751	+0.007	5.694	-7.389	+0.078	-12.270	+0.121
12	5	23	31.871	32.618	-0.748	+0.002	5.692	-7.390	+0.079	-12.237	+0.038
13	5	27	28.424	29.173	-0.746	-0.002	5.677	-7.391	+0.066	-12.202	-0.039
14	5	31	24.978	25.728	-0.744	-0.006	5.652	-7.390	+0.041	-12.168	-0.096
15	5	35	21.534	22.284	-0.742	-0.008	5.621	-7.389	+0.011	-12.132	-0.126
16	5	39	18.091	18.839	-0.740	-0.008	5.590	-7.388	-0.020	-12.097	-0.127
17	5	43	14.651	15.394	-0.738	-0.006	5.564	-7.385	-0.047	-12.061	-0.101
18	5	47	11.211	11.950	-0.736	-0.003	5.548	-7.382	-0.065	-12.025	-0.055
19	5	51	7.772	8.505	-0.733	+0.000	5.544	-7.379	-0.072	-11.988	+0.001
20	5	55	4.333	5.061	-0.731	+0.003	5.553	-7.374	-0.067	-11.951	+0.057
21	5	59	0.893	1.616	-0.729	+0.006	5.573	-7.369	-0.050	-11.914	+0.100
22	6	2	57.452	58.171	-0.727	+0.008	5.603	-7.363	-0.025	-11.878	+0.123
23	6	6	54.010	54.727	-0.724	+0.007	5.638	-7.356	+0.005	-11.841	+0.118
24	6	10	50.565	51.282	-0.722	+0.005	5.674	-7.349	+0.034	-11.804	+0.085
25	6	14	47.119	47.837	-0.720	+0.002	5.704	-7.341	+0.058	-11.767	+0.025
26	6	18	43.672	44.393	-0.718	-0.003	5.724	-7.332	+0.070	-11.731	-0.053
27	6	22	40.224	40.948	-0.715	-0.008	5.730	-7.322	+0.068	-11.695	-0.137
28	6	26	36.778	37.503	-0.713	-0.013	5.721	-7.312	+0.051	-11.659	-0.209
29	6	30	33.333	34.059	-0.711	-0.015	5.699	-7.301	+0.019	-11.623	-0.250
30	6	34	29.891	30.614	-0.709	-0.015	5.670	-7.289	-0.021	-11.588	-0.243
31	6	38	26.452	27.170	-0.707	-0.011	5.645	-7.277	-0.057	-11.553	-0.184
32	6	42	23.015	23.725	-0.705	-0.005	5.633	-7.264	-0.081	-11.519	-0.081