

## AGE CONVERSION TABLE FOR DIFFERENT TIME SCALES

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The geomagnetic polarity time scale of Berggren *et al.* (1985) has been widely used in the last decade. The numerical ages of nannofossil (or other fossil) datums or zonal boundaries have been given almost exclusively in that time scale. Cande and Kent (1992) recently published a significantly improved geomagnetic polarity time scale. Their study made at least four major improvements: (1) they generated a more reliable baseline marine magnetic profile by reevaluating a suite of South Atlantic profiles instead of relying on the single profile of Heirtzler *et al.* (1968) as used by Berggren *et al.* (1985); (2) they increased the resolution by stacking high-resolution profiles from other areas with faster spreading ridges onto the improved South Atlantic magnetic profile; (3) they adopted a number of age control points that have been well determined in recent studies. These include new  $^{40}\text{Ar}/^{39}\text{Ar}$  and astronomical ages. In the previous time scale of Berggren *et al.* (1985) several age control points have been found to be in large error (e.g., Prothero and Swisher, 1992; Berggren *et al.*, 1992); (4) Cande and Kent (1992) used a cubic spline instead of a linear interpolation to estimate the ages of anomalies between calibration points, avoiding introducing artificial instantaneous plate accelerations at control points. The age differences between the time scale of Cande and Kent (1992) and that of Berggren *et al.* (1985) are significant, particularly in the Palaeogene, where the differences are up to 3.2 Ma. Most recently, Shackleton *et al.* (1994) proposed a new time scale for the last 14.8 m.y. (chron C1 through chron C5AD). They improved the time scale for the last 6 m.y. by astronomically tuning the GRAPE and oxygen isotope records from ODP Leg 138 in the eastern equatorial Pacific. For the period between 6 Ma and 14.8 Ma Shackleton *et al.* (1994) adopted a new age calibration by Baksi (1992) for the top of C5.n1 and tuned parts of the 6-10 Ma interval to the astronomical cycles. The age differences between this time scale and that of Cande and Kent (1992) are small, generally less than 0.1 m.y. and never more than 0.19 m.y. Shackleton *et al.* (1994) consider their time scale to be robust for the last 6 m.y. and less secure for the 6-14.8 Ma interval.

It is clear now that the time scale of Berggren *et al.* (1985) is no longer appropriate to use. Numerical ages given in this old time scale need to be converted to the new time scales whenever and wherever accurate ages are desired. Wei and Peleo-Alampay (1993) provided an equation for converting numerical ages from Berggren *et al.* (1985) time scale to Cande and Kent (1992) time scale. This equation can be written in a general form for age conversion among different time scales:

$$A_2 = (T_2A_1 - A_1B_2 + T_1B_2 - T_2B_1)/(T_1 - B_1)$$

where A is the age to be converted from or to, T and B are the ages for the top and bottom, respectively, of the magnetic chron/subchron which brackets the age to be converted from/to, and the subscripts "1" and "2" indicate time scales 1 and 2, respectively. For example, the

top and bottom of chron C21n are of 48.75 Ma and 50.34 Ma, respectively, in the time scale of Berggren *et al.* (1985), and 46.284 Ma and 47.861 Ma, respectively, in the time scale of Cande and Kent (1992); an age of 49.8 Ma (the first occurrence of nannofossil *Nannotetrina fulgens*) in the time scale of Berggren *et al.* (1985) can be converted to the time scale of Cande and Kent (1992) as:

$$\begin{aligned} A_2 &= (46.286 \times 49.8 - 49.8 \times 47.861 + 48.75 \times 47.861 - \\ &46.284 \times 50.34) / (48.75 - 50.34) \\ &= 47.3 \text{ Ma} \end{aligned}$$

This kind of age conversion is needed frequently by workers who deal with numerical ages and the calculation is time consuming. So I have constructed Table 1 for age conversion among the time scales of Berggren *et al.* (1985), Cande and Kent (1992), and Shackleton *et al.* (1994), based on the above equation. This makes age conversion as quick and accurate as anyone would normally desire, and should be useful to nannofossil workers or practically any workers who are concerned with numerical ages for the last 84 m.y.

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### REFERENCES

- Baksi, A.K., 1992: A  $^{40}\text{Ar}/^{39}\text{Ar}$  age for the termination of Chron 5; a new calibration point for the Miocene section of the GPTS. *EOS*, **73**, 630.
- Berggren, W.A., Kent, D.V., Flynn, J.J. & van Couvering, J.A., 1985: Cenozoic geochronology. *Geol. Soc. Am. Bull.*, **96**, 1407-1418.
- Berggren, W.A., Kent, D.V., Obradovic, J.D. & Swisher, C.C. III, 1992: Toward a revised Paleogene geochronology. In: Prothero D.R. & Berggren W.A. (eds.) *Eocene-Oligocene Climatic and Biotic Evolution*, Princeton University Press, Princeton, p. 29-45.
- Cande, S. & Kent, D.V., 1992: A new geomagnetic polarity time scale for the Late Cretaceous and Cenozoic. *J. Geophys. Res.*, **97**, 13917-13951.
- Heirtzler, J.R., Dickson, G.O., Herron, E.M., Pitman, W.C. and Le Pichon, X., 1968: Marine magnetic anomalies, geomagnetic field reversals, and motions of the ocean floor and continents. *J. Geophys. Res.*, **73**, 2119-2136.
- Prothero, D.R. & Swisher, C.C. III., 1992: Magnetostratigraphy and geochronology of the terrestrial Eocene-Oligocene transition in the North American. In: Prothero D.R. & Berggren W.A. (eds.) *Eocene-Oligocene Climatic and Biotic Evolution*, Princeton University Press, Princeton, p. 46-73.
- Shackleton, N.J., Crowhurst, S., Hagelberg, T., Pisias, N. & Schneider, D.A., 1994: A new late Neogene timescale: Application to ODP Leg 138 sites. *Proc. ODP Sci. Res.*, **138** (in press).
- Wei, W. & Peleo-Alampay, A., 1993: Updated Cenozoic nannofossil magnetobiochronology. *INA Newslet.*, **15**, 15-17.

Table 1. Age (Ma) conversion among different time scales

B85	CK92	S94	B85	CK92	S94	B85	CK92	S94	B85	CK92	S94	B85	CK92	S94	B85	CK92
0.00	0.000	0.000	0.89	0.961	0.967	1.69	1.788	1.795	<b>6.37</b>	<b>6.744</b>	<b>6.919</b>	<b>12.46</b>	<b>12.618</b>	<b>12.605</b>	18.50	18.256
0.10	0.107	0.107	0.90	0.973	0.978	1.70	1.798	1.803	6.40	6.780	6.954	<b>12.49</b>	<b>12.649</b>	<b>12.637</b>	<b>18.56</b>	<b>18.317</b>
0.11	0.118	0.118	<b>0.91</b>	<b>0.984</b>	<b>0.990</b>	1.71	1.808	1.811	<b>6.50</b>	<b>6.901</b>	<b>7.072</b>	12.50	12.657	12.645	18.60	18.355
0.12	0.128	0.128	0.92	0.993	1.001	1.72	1.819	1.819	6.60	7.073	7.239	<b>12.58</b>	<b>12.718</b>	<b>12.705</b>	18.70	18.449
0.13	0.139	0.139	0.93	1.003	1.013	1.73	1.829	1.827	<b>6.70</b>	<b>7.245</b>	<b>7.406</b>	12.60	12.741	12.729	18.80	18.543
0.14	0.150	0.150	0.94	1.012	1.024	1.74	1.839	1.835	<b>6.78</b>	<b>7.376</b>	<b>7.533</b>	<b>12.62</b>	<b>12.764</b>	<b>12.752</b>	18.90	18.638
0.15	0.160	0.160	0.95	1.021	1.036	1.75	1.849	1.844	6.80	7.401	7.557	12.70	12.831	12.819	19.00	18.732
0.16	0.171	0.171	0.96	1.030	1.047	1.76	1.860	1.852	<b>6.85</b>	<b>7.464</b>	<b>7.618</b>	12.80	12.916	12.904	<b>19.09</b>	<b>18.817</b>
0.17	0.182	0.182	0.97	1.040	1.059	1.77	1.870	1.860	6.90	7.514	7.666	<b>12.83</b>	<b>12.941</b>	<b>12.929</b>	19.10	18.827
0.18	0.192	0.192	<b>0.98</b>	<b>1.049</b>	<b>1.070</b>	1.78	1.880	1.868	7.00	7.613	7.761	12.90	13.001	12.989	19.20	18.930
0.19	0.203	0.203	0.99	1.059	1.080	1.79	1.891	1.876	7.10	7.713	7.856	13.00	13.086	13.074	19.30	19.032
0.20	0.214	0.214	1.00	1.070	1.091	1.80	1.901	1.885	7.20	7.812	7.951	<b>13.01</b>	<b>13.094</b>	<b>13.083</b>	<b>19.35</b>	<b>19.083</b>
0.21	0.224	0.224	1.01	1.080	1.101	1.81	1.911	1.893	<b>7.28</b>	<b>7.892</b>	<b>8.027</b>	13.10	13.174	13.163	19.40	19.132
0.22	0.235	0.235	1.02	1.091	1.111	1.82	1.921	1.901	7.30	7.936	8.069	<b>13.20</b>	<b>13.263</b>	<b>13.252</b>	19.50	19.230
0.23	0.246	0.246	1.03	1.101	1.121	1.83	1.932	1.909	<b>7.35</b>	<b>8.047</b>	<b>8.174</b>	13.30	13.345	13.334	19.60	19.328
0.24	0.256	0.256	1.04	1.111	1.132	1.84	1.942	1.917	7.40	8.074	8.200	13.40	13.427	13.417	19.70	19.426
0.25	0.267	0.267	1.05	1.122	1.142	1.85	1.952	1.925	<b>7.41</b>	<b>8.079</b>	<b>8.205</b>	<b>13.46</b>	<b>13.476</b>	<b>13.466</b>	19.80	19.524
0.26	0.278	0.278	1.06	1.132	1.152	1.86	1.962	1.934	7.50	8.162	8.283	13.50	13.510	13.501	19.90	19.623
0.27	0.288	0.288	1.07	1.143	1.163	1.87	1.973	1.942	7.60	8.253	8.370	13.60	13.597	13.588	20.00	19.721
0.28	0.299	0.299	1.08	1.153	1.173	<b>1.88</b>	<b>1.983</b>	<b>1.950</b>	7.70	8.345	8.457	<b>13.69</b>	<b>13.674</b>	<b>13.666</b>	20.10	19.819
0.29	0.310	0.310	1.09	1.164	1.183	1.89	1.993	1.961	7.80	8.437	8.544	13.70	13.684	13.676	20.20	19.917
0.30	0.321	0.321	1.10	1.174	1.194	1.90	2.004	1.972	<b>7.90</b>	<b>8.529</b>	<b>8.631</b>	13.80	13.783	13.775	20.30	20.015
0.31	0.331	0.331	1.11	1.184	1.204	2.00	2.108	2.082	8.00	8.636	8.732	13.90	13.881	13.874	20.40	20.113
0.32	0.342	0.342	1.12	1.195	1.214	2.10	2.213	2.192	8.10	8.743	8.834	14.00	13.980	13.974	<b>20.45</b>	<b>20.162</b>
0.33	0.353	0.353	1.13	1.205	1.224	2.20	2.318	2.303	8.20	8.850	8.935	<b>14.08</b>	<b>14.059</b>	<b>14.053</b>	20.50	20.207
0.34	0.363	0.363	1.14	1.216	1.235	2.30	2.422	2.413	<b>8.21</b>	<b>8.861</b>	<b>8.945</b>	14.10	14.077	14.071	20.60	20.296
0.35	0.374	0.374	1.15	1.226	1.245	2.40	2.527	2.523	8.30	8.955	9.034	<b>14.20</b>	<b>14.164</b>	<b>14.159</b>	20.70	20.385
0.36	0.385	0.385	1.16	1.236	1.255	<b>2.47</b>	<b>2.600</b>	<b>2.600</b>	8.40	9.059	9.132	14.30	14.261	14.256	20.80	20.475
0.37	0.395	0.395	1.17	1.247	1.266	2.50	2.630	2.629	<b>8.41</b>	<b>9.069</b>	<b>9.142</b>	14.40	14.357	14.354	<b>20.88</b>	<b>20.546</b>
0.38	0.406	0.406	1.18	1.257	1.276	2.60	2.731	2.727	<b>8.50</b>	<b>9.149</b>	<b>9.218</b>	14.50	14.454	14.451	20.90	20.561
0.39	0.417	0.417	1.19	1.268	1.286	2.70	2.832	2.825	8.60	9.282	9.344	14.60	14.550	14.549	21.00	20.634
0.40	0.427	0.427	1.20	1.278	1.296	2.80	2.933	2.923	8.70	9.415	9.469	<b>14.66</b>	<b>14.608</b>	<b>14.607</b>	21.10	20.708
0.41	0.438	0.438	1.21	1.288	1.307	<b>2.92</b>	<b>3.054</b>	<b>3.040</b>	<b>8.71</b>	<b>9.428</b>	<b>9.482</b>	14.70	14.645	14.644	21.16	<b>20.752</b>
0.42	0.449	0.449	1.22	1.299	1.317	<b>2.99</b>	<b>3.127</b>	<b>3.110</b>	<b>8.80</b>	<b>9.491</b>	<b>9.543</b>	14.80	14.736	14.736	21.20	20.801
0.43	0.459	0.459	1.23	1.309	1.327	3.00	3.137	3.124	8.90	9.575	9.623	<b>14.87</b>	<b>14.800</b>	<b>14.800</b>	21.30	20.923
0.44	0.470	0.470	1.24	1.320	1.338	<b>3.08</b>	<b>3.221</b>	<b>3.232</b>	<b>8.92</b>	<b>9.592</b>	<b>9.639</b>	14.90	14.830		21.38	<b>21.021</b>
0.45	0.481	0.481	1.25	1.330	1.348	3.10	3.242	3.452	9.00	9.658	9.703	<b>14.96</b>	<b>14.890</b>		21.40	21.041
0.46	0.492	0.492	1.26	1.341	1.358	<b>3.18</b>	<b>3.325</b>	<b>4.331</b>	9.10	9.741	9.783	15.00	14.925		21.50	21.131
0.47	0.502	0.502	1.27	1.351	1.369	3.20	3.346	4.260	9.20	9.824	9.863	15.10	15.012		21.60	21.236
0.48	0.513	0.513	1.28	1.361	1.379	3.30	3.449	3.907	9.30	9.907	9.943	15.13	<b>15.038</b>		21.70	21.333
0.49	0.524	0.524	1.29	1.372	1.389	<b>3.40</b>	<b>3.553</b>	<b>3.553</b>	9.40	9.989	10.023	15.20	15.100		21.71	21.349
0.50	0.534	0.534	1.30	1.382	1.399	3.50	3.653	3.688	9.50	10.072	10.103	<b>15.27</b>	<b>15.162</b>		21.80	21.553
0.51	0.545	0.545	1.31	1.393	1.410	3.60	3.753	3.822	9.60	10.155	10.183	15.30	15.190		21.90	21.787
0.52	0.556	0.556	1.32	1.403	1.420	3.70	3.853	3.957	9.70	10.238	10.263	15.40	15.281		22.00	21.843
0.53	0.566	0.566	1.33	1.413	1.430	3.80	3.953	4.091	9.80	10.321	10.343	15.50	15.373		<b>22.06</b>	<b>21.877</b>
0.54	0.577	0.577	1.34	1.424	1.441	<b>3.88</b>	<b>4.033</b>	<b>4.199</b>	9.90	10.403	10.423	15.60	15.465		22.10	21.938
0.55	0.588	0.588	1.35	1.434	1.451	3.90	4.055	4.225	10.00	10.486	10.503	15.70	15.557		22.20	22.090
0.56	0.598	0.598	1.36	1.445	1.461	<b>3.97</b>	<b>4.134</b>	<b>4.316</b>	10.10	10.569	10.583	15.80	15.649		<b>22.25</b>	<b>22.166</b>
0.57	0.609	0.609	1.37	1.455	1.471	4.00	4.164	4.354	10.20	10.652	10.663	15.90	15.741		22.30	22.215
0.58	0.620	0.620	1.38	1.465	1.482	<b>4.10</b>	<b>4.265</b>	<b>4.479</b>	10.30	10.735	10.743	16.00	15.833		<b>22.35</b>	<b>22.263</b>
0.59	0.630	0.630	1.39	1.476	1.492	4.20	4.384	4.582	10.40	10.817	10.823	16.10	15.925		22.40	22.339
0.60	0.641	0.641	1.40	1.486	1.502	4.24	4.432	4.623	<b>10.42</b>	<b>10.834</b>	<b>10.839</b>	16.20	16.017		22.50	22.492
0.61	0.652	0.652	1.41	1.497	1.513	4.30	4.499	4.682	10.50	10.905	10.908	<b>16.22</b>	<b>16.035</b>		<b>22.57</b>	<b>22.599</b>
0.62	0.662	0.662	1.42	1.507	1.523	<b>4.40</b>	<b>4.611</b>	<b>4.781</b>	<b>10.54</b>	<b>10.940</b>	<b>10.943</b>	16.30	16.110		22.60	22.635
0.63	0.673	0.673	1.43	1.518	1.533	<b>4.47</b>	<b>4.694</b>	<b>4.878</b>	<b>10.59</b>	<b>10.989</b>	<b>10.991</b>	16.40	16.205		22.70	22.754
0.64	0.684	0.684	1.44	1.528	1.544	4.50	4.729	4.908	<b>10.60</b>	<b>10.998</b>	<b>11.000</b>	16.50	16.299		22.80	22.873
0.65	0.695	0.695	1.45	1.538	1.554	4.57	<b>4.812</b>	<b>4.977</b>	10.70	11.086	11.087	16.52	16.318		22.90	22.993
0.66	0.705	0.705	1.46	1.549	1.564	4.60	4.847	5.015	10.80	11.175	11.173	<b>16.56</b>	<b>16.352</b>		<b>22.97</b>	<b>23.076</b>
0.67	0.716	0.716	1.47	1.559	1.574	4.70	4.964	5.143	10.90	11.263	11.260	16.60	16.390		23.00	23.104
0.68	0.727	0.727	1.48	1.570	1.585	4.77	<b>5.046</b>	<b>5.232</b>	11.00	11.351	11.347	16.70	16.486		23.10	23.198
0.69	0.737	0.737	1.49	1.580	1.595	4.80	5.080	5.266	<b>11.03</b>	<b>11.378</b>	<b>11.373</b>	16.73	16.513		23.20	23.291
0.70	0.748	0.748	1.50	1.590	1.605	4.90	5.194	5.379	<b>11.09</b>	<b>11.434</b>	<b>11.428</b>	<b>16.80</b>	<b>16.583</b>		<b>23.27</b>	<b>23.357</b>
0.71	0.759	0.759	1.51	1.601	1.616	5.00	5.307	5.492	11.10	11.443	11.437	16.90	16.679		23.30	23.389
0.72	0.769	0.769	1.52	1.611	1.626	5.10	5.421	5.605	11.20	11.534	11.527	<b>16.98</b>	<b>16.755</b>		23.40	23.495
0.73	<b>0.780</b>	<b>0.780</b>	1.53	1.622	1.636	5.20	5.535	5.718	11.30	11.625	11.617	17.00	16.774		<b>23.44</b>	<b>23.537</b>
0.74	0.791	0.792	1.54	1.632	1.646	5.30	5.648	5.831	11.40	11.716	11.706	17.10	16.863			

Table 1 (continued)

B85	CK92														
24.60	24.299	31.40	29.499	38.80	35.986	46.10	43.811	<b>53.88</b>	<b>50.646</b>	61.10	58.712	68.60	68.830	76.30	75.485
24.70	24.346	31.50	29.574	38.90	36.077	<b>46.17</b>	<b>43.868</b>	53.90	50.668	61.20	58.860	68.70	68.937	76.40	75.570
24.80	24.393	<b>31.58</b>	<b>29.633</b>	39.00	36.167	46.20	43.896	54.00	50.779	61.30	59.007	68.80	69.043	76.50	75.655
24.90	24.440	31.60	29.668	39.10	36.257	46.30	43.990	<b>54.03</b>	<b>50.812</b>	61.40	59.154	68.90	69.150	76.60	75.740
25.00	24.487	<b>31.64</b>	<b>29.737</b>	39.20	36.347	46.40	44.083	<b>54.09</b>	<b>50.913</b>	61.50	59.302	69.00	69.257	76.70	75.825
25.10	24.534	31.70	29.785	<b>39.24</b>	<b>36.383</b>	46.50	44.177	54.10	50.924	61.60	59.449	69.10	69.363	76.80	75.910
25.20	24.581	31.80	29.864	39.30	36.441	46.60	44.271	54.20	51.039	61.70	59.596	69.20	69.470	76.90	75.996
25.30	24.628	31.90	29.944	39.40	36.539	46.70	44.364	54.30	51.153	61.80	59.743	69.30	69.576	77.00	76.081
25.40	24.675	32.00	30.023	39.50	36.636	46.80	44.458	54.40	51.267	61.90	59.891	<b>69.40</b>	<b>69.683</b>	77.10	76.166
<b>25.50</b>	<b>24.722</b>	<b>32.06</b>	<b>30.071</b>	<b>39.53</b>	<b>36.665</b>	46.90	44.552	54.50	51.381	62.00	60.038	69.50	69.787	77.20	76.251
<b>25.60</b>	<b>24.772</b>	32.10	30.109	39.60	36.733	47.00	44.645	54.60	51.495	62.10	60.185	69.60	69.890	77.30	76.336
<b>25.67</b>	<b>24.826</b>	32.20	30.204	39.70	36.829	47.10	44.739	<b>54.70</b>	<b>51.609</b>	62.20	60.333	69.70	69.994	77.40	76.422
25.70	24.861	32.30	30.300	39.80	36.926	47.20	44.833	54.80	51.752	62.30	60.480	69.80	70.097	77.50	76.507
25.80	24.976	32.40	30.395	39.90	37.022	47.30	44.926	54.90	51.895	62.40	60.627	69.90	70.201	77.60	76.592
25.90	25.091	<b>32.46</b>	<b>30.452</b>	40.00	37.119	47.40	45.020	55.00	52.038	62.50	60.774	70.00	70.304	77.70	76.677
<b>25.97</b>	<b>25.171</b>	32.50	30.494	40.10	37.215	47.50	45.113	55.10	52.181	62.60	60.922	70.10	70.408	77.80	76.762
26.00	25.194	32.60	30.599	40.20	37.312	47.60	45.207	<b>55.14</b>	<b>52.238</b>	62.70	61.069	70.20	70.511	77.90	76.847
26.10	25.270	32.70	30.705	40.30	37.408	47.70	45.301	55.20	52.318	62.80	61.216	70.30	70.615	78.00	76.933
26.20	25.345	32.80	30.810	40.40	37.505	47.80	45.394	55.30	52.451	62.90	61.364	70.40	70.718	78.10	77.018
26.30	25.421	<b>32.90</b>	<b>30.915</b>	40.43	37.534	47.90	45.488	<b>55.37</b>	<b>52.544</b>	63.00	61.511	70.50	70.822	78.20	77.103
<b>26.38</b>	<b>25.482</b>	33.00	31.004	<b>40.50</b>	<b>37.667</b>	48.00	45.582	55.40	52.570	<b>63.03</b>	<b>61.555</b>	70.60	70.925	78.30	77.188
26.40	25.499	33.10	31.094	40.60	37.791	48.10	45.675	55.50	52.655	63.10	61.609	70.70	71.029	78.40	77.273
26.50	25.583	33.20	31.183	<b>40.70</b>	<b>37.915</b>	48.20	45.769	55.60	52.740	63.20	61.687	70.80	71.132	78.50	77.359
<b>26.56</b>	<b>25.633</b>	33.30	31.272	<b>40.77</b>	<b>37.988</b>	48.30	45.863	<b>55.66</b>	<b>52.791</b>	63.30	61.765	70.90	71.236	78.60	77.444
26.60	25.656	33.40	31.362	40.80	38.005	48.40	45.956	55.70	52.829	63.40	61.842	71.00	71.339	78.70	77.529
26.70	25.714	33.50	31.451	40.90	38.063	48.50	46.050	55.80	52.925	63.50	61.920	71.10	71.443	78.80	77.614
26.80	25.772	33.60	31.540	41.00	38.120	48.60	46.144	55.90	53.021	<b>63.54</b>	<b>61.951</b>	71.20	71.546	78.90	77.699
<b>26.86</b>	<b>25.807</b>	33.70	31.630	41.10	38.177	48.70	46.237	56.00	53.116	63.60	62.059	71.30	71.650	79.00	77.784
26.90	25.880	33.80	31.719	<b>41.11</b>	<b>38.183</b>	<b>48.75</b>	<b>46.284</b>	56.10	53.212	63.70	62.239	71.37	71.722	79.10	77.870
<b>26.93</b>	<b>25.934</b>	33.90	31.808	41.20	38.342	48.80	46.334	<b>56.14</b>	<b>53.250</b>	63.80	62.420	71.40	71.746	79.20	77.955
27.00	25.969	34.00	31.898	<b>41.29</b>	<b>38.500</b>	48.90	46.433	56.20	53.316	63.90	62.600	71.50	71.825	79.30	78.040
<b>27.01</b>	<b>25.974</b>	34.10	31.987	41.30	38.512	49.00	46.532	56.30	53.425	64.00	62.780	71.60	71.904	79.40	78.125
27.10	26.043	34.20	32.076	41.40	38.633	49.10	46.631	56.40	53.534	64.10	62.960	<b>71.65</b>	<b>71.943</b>	79.50	78.210
27.20	26.119	34.30	32.166	41.50	38.754	49.20	46.730	56.50	53.643	64.20	63.141	71.70	71.982	79.60	78.295
27.30	26.195	34.40	32.255	41.60	38.876	49.30	46.830	56.60	53.753	<b>64.29</b>	<b>63.303</b>	71.80	72.061	79.70	78.381
27.40	26.273	34.50	32.344	41.70	38.997	49.40	46.929	56.70	53.862	64.30	63.318	71.90	72.139	79.80	78.466
27.50	26.349	34.60	32.434	41.80	39.118	49.50	47.028	56.80	53.971	64.40	63.467	<b>71.91</b>	<b>72.147</b>	79.90	78.551
27.60	26.426	34.70	32.523	41.90	39.239	49.60	47.127	56.90	54.080	64.50	63.616	72.00	72.210	80.00	78.636
27.70	26.502	34.80	32.612	42.00	39.360	49.70	47.226	57.00	54.189	64.60	63.766	72.10	72.279	80.10	78.721
<b>27.74</b>	<b>26.533</b>	34.90	32.702	42.10	39.481	49.80	47.325	57.10	54.299	64.70	63.915	72.20	72.349	<b>80.17</b>	<b>78.781</b>
27.80	26.602	35.00	32.791	42.20	39.603	49.90	47.425	57.20	54.408	64.80	64.064	72.30	72.418	80.20	78.814
27.90	26.717	35.10	32.880	<b>42.23</b>	<b>39.639</b>	50.00	47.524	57.30	54.517	64.90	64.214	72.40	72.488	80.30	78.924
28.00	26.832	35.20	32.970	<b>42.30</b>	<b>39.718</b>	50.10	47.623	57.40	54.626	65.00	64.363	72.50	72.557	80.40	79.034
28.10	26.947	<b>35.29</b>	<b>33.050</b>	42.40	39.835	50.20	47.722	57.50	54.736	65.10	64.512	72.60	72.627	80.50	79.145
<b>28.15</b>	<b>27.004</b>	35.30	33.059	42.50	39.952	50.30	47.821	57.60	54.845	65.12	<b>64.542</b>	72.70	72.697	80.60	79.255
28.20	27.048	35.40	33.144	42.60	40.069	<b>50.34</b>	<b>47.861</b>	57.70	54.954	65.20	64.620	72.80	72.766	80.70	79.365
28.30	27.137	35.50	33.229	42.70	40.186	50.40	47.901	57.80	55.063	65.30	64.717	72.90	72.836	80.80	79.475
28.40	27.226	35.60	33.314	<b>42.73</b>	<b>40.221</b>	50.50	47.969	57.90	55.173	65.40	64.814	73.00	72.905	80.90	79.585
28.50	27.315	35.70	33.399	42.80	40.312	50.60	48.036	58.00	55.282	<b>65.50</b>	<b>64.911</b>	73.10	72.975	81.00	79.695
28.60	27.404	35.80	33.484	42.90	40.442	50.70	48.104	58.10	55.391	65.60	65.034	73.20	73.044	81.10	79.805
28.70	27.493	<b>35.87</b>	<b>33.543</b>	43.00	40.572	50.80	48.171	58.20	55.500	65.70	65.156	73.30	73.114	81.20	79.916
28.80	27.582	35.90	33.568	43.10	40.702	50.90	48.239	58.30	55.610	65.80	65.279	73.40	73.184	81.30	80.026
28.90	27.671	36.00	33.650	43.20	40.833	51.00	48.306	58.40	55.719	65.90	65.401	73.50	73.253	81.40	80.136
29.00	27.759	36.10	33.732	43.30	40.963	51.10	48.374	58.50	55.828	66.00	65.524	73.55	73.288	81.50	80.246
29.10	27.848	36.20	33.814	43.40	41.093	51.20	48.441	58.60	55.937	66.10	65.646	73.60	73.316	81.60	80.356
29.20	27.937	36.30	33.896	43.50	41.223	51.30	48.509	<b>58.64</b>	<b>55.981</b>	<b>66.17</b>	<b>65.732</b>	73.70	73.372	81.70	80.466
<b>29.21</b>	<b>27.946</b>	36.40	33.979	<b>43.60</b>	<b>41.353</b>	51.40	48.576	58.70	56.034	66.20	65.778	73.80	73.428	81.80	80.577
29.30	27.999	36.50	34.061	43.70	41.410	51.50	48.643	58.80	56.123	66.30	65.930	73.90	73.483	81.90	80.687
29.40	28.059	36.60	34.143	43.80	41.468	51.60	48.711	58.90	56.212	66.40	66.083	<b>73.96</b>	<b>73.517</b>	82.00	80.797
29.50	28.118	36.70	34.225	43.90	41.525	51.70	48.778	59.00	56.301	66.50	66.235	74.00	73.571	82.10	80.907
29.60	28.178	36.80	34.307	44.00	41.583	51.80	48.846	59.10	56.390	66.60	66.388	<b>74.01</b>	<b>73.584</b>	82.20	81.017
29.70	28.237	36.90	34.390	<b>44.06</b>	<b>41.617</b>	51.90	48.913	59.20	56.479	66.70	66.540	74.10	73.645	82.30	81.127
<b>29.73</b>	<b>28.255</b>	37.00	34.472	44.10	41.684	<b>51.95</b>	<b>48.947</b>	<b>59.24</b>	<b>56.515</b>	<b>66.74</b>	<b>66.601</b>	74.20	73.713	82.40	81.237
29.80	28.308	37.10	34.554	44.20	41.853	52.00	48.996	59.30	56.594	66.80	66.673	<b>74.30</b>	<b>73.781</b>	82.50	81.348
29.90	28.385	37.20	34.636	44.30	42.022	52.10	49.094	59.40	56.727	66.90	66.794	74.40	73.866	82.60	81.458
30.00	28.461	<b>37.24</b>	<b>34.669</b>	44.40	42.190	52.20	49.192	59.50	56.859	67.00	66.914	74.50	73.951	82.70	81.568
<b>30.03</b>	<b>28.484</b>	37.30	34.748	44.50	42.359	52.30	49.290	59.60	56.992	67.10	67.035	74.60	74.037	82.80	81.678