

**Table 6.8 DIGAMMA FUNCTION FOR COMPLEX ARGUMENTS**  
 $x=1.0$

$y$	$\Re\psi(z)$	$\Im\psi(z)$	$y$	$\Re\psi(z)$	$\Im\psi(z)$
0.0	-0.57721 56649	0.00000	5.0	1.61278 48446	1.47080
0.1	-0.56529 77902	0.16342	5.1	1.63245 69889	1.47276
0.2	-0.53073 04055	0.32064	5.2	1.65175 20861	1.47464
0.3	-0.47675 48934	0.46653	5.3	1.67068 42228	1.47646
0.4	-0.40786 79442	0.59770	5.4	1.68926 67162	1.47820
0.5	-0.32888 63572	0.71269	5.5	1.70751 21687	1.47989
0.6	-0.24419 65809	0.81160	5.6	1.72543 25175	1.48151
0.7	-0.15733 61258	0.89563	5.7	1.74303 90807	1.48308
0.8	-0.07088 34022	0.96655	5.8	1.76034 25988	1.48459
0.9	+0.01345 20154	1.02628	5.9	1.77735 32733	1.48605
1.0	0.09465 03206	1.07667	6.0	1.79408 08018	1.48746
1.1	0.17219 05426	1.11938	6.1	1.81053 44105	1.48883
1.2	0.24588 65515	1.15580	6.2	1.82672 28842	1.49015
1.3	0.31576 20906	1.18707	6.3	1.84265 45939	1.49143
1.4	0.38196 28134	1.21413	6.4	1.85833 75219	1.49267
1.5	0.44469 79402	1.23772	6.5	1.87377 92858	1.49387
1.6	0.50420 34618	1.25843	6.6	1.88898 71602	1.49504
1.7	0.56072 00645	1.27675	6.7	1.90396 80964	1.49617
1.8	0.61448 06554	1.29306	6.8	1.91872 87422	1.49727
1.9	0.66570 39172	1.30766	6.9	1.93327 54582	1.49833
2.0	0.71459 15154	1.32081	7.0	1.94761 43346	1.49937
2.1	0.76132 74328	1.33271	7.1	1.96175 12062	1.50037
2.2	0.80607 84807	1.34353	7.2	1.97569 16663	1.50135
2.3	0.84899 54079	1.35341	7.3	1.98944 10799	1.50230
2.4	0.89021 42662	1.36246	7.4	2.00300 45959	1.50323
2.5	0.92985 78387	1.37080	7.5	2.01638 71585	1.50413
2.6	0.96803 70243	1.37849	7.6	2.02959 35177	1.50501
2.7	1.00485 21252	1.38561	7.7	2.04262 82397	1.50586
2.8	1.04039 40175	1.39222	7.8	2.05549 57159	1.50669
2.9	1.07474 51976	1.39838	7.9	2.06820 01717	1.50751
3.0	1.10798 07107	1.40413	8.0	2.08074 56749	1.50830
3.1	1.14016 89703	1.40951	8.1	2.09313 61434	1.50907
3.2	1.17137 24783	1.41455	8.2	2.10537 53524	1.50982
3.3	1.20164 84581	1.41928	8.3	2.11746 69410	1.51056
3.4	1.23104 94107	1.42374	8.4	2.12941 44191	1.51127
3.5	1.25962 36033	1.42794	8.5	2.14122 11731	1.51197
3.6	1.28741 54995	1.43191	8.6	2.15289 04718	1.51266
3.7	1.31446 61381	1.43566	8.7	2.16442 54716	1.51332
3.8	1.34081 34679	1.43922	8.8	2.17582 92217	1.51398
3.9	1.36649 26435	1.44259	8.9	2.18710 46687	1.51462
4.0	1.39153 62879	1.44580	9.0	2.19825 46616	1.51524
4.1	1.41597 47255	1.44885	9.1	2.20928 19555	1.51585
4.2	1.43983 61892	1.45175	9.2	2.22018 92160	1.51645
4.3	1.46314 70060	1.45452	9.3	2.23097 90229	1.51703
4.4	1.48593 17620	1.45716	9.4	2.24165 38740	1.51760
4.5	1.50821 34505	1.45969	9.5	2.25221 61882	1.51816
4.6	1.53001 36052	1.46210	9.6	2.26266 83093	1.51871
4.7	1.55135 24197	1.46441	9.7	2.27301 25085	1.51925
4.8	1.57224 88550	1.46663	9.8	2.28325 09877	1.51978
4.9	1.59272 07370	1.46876	9.9	2.29338 58823	1.52029
5.0	1.61278 48446	1.47080	10.0	2.30341 92637	1.52080

$$\left[ \begin{matrix} (-3)2 \\ 5 \end{matrix} \right] \quad \left[ \begin{matrix} (-5)5 \\ 6 \end{matrix} \right] \quad \left[ \begin{matrix} (-5)1 \\ 2 \end{matrix} \right]$$

$$\Im\psi(1+iy) = \frac{1}{2}\pi \coth \pi y - \frac{1}{2y}$$

$\psi(z)$  to 5D, computed by M. Goldstein, Los Alamos Scientific Laboratory.

**AUXILIARY FUNCTION FOR  $\Re\psi(1+iy)$**

$y^{-1}$	$f_4(y)$	$\langle y \rangle$	$y^{-1}$	$f_4(y)$	$\langle y \rangle$
0.11	0.00100 956	9	0.05	0.00020 839	20
0.10	0.00083 417	10	0.04	0.00013 335	25
0.09	0.00067 555	11	0.03	0.00007 501	33
0.08	0.00053 368	13	0.02	0.00003 333	50
0.07	0.00040 853	14	0.01	0.00000 833	100
0.06	0.00030 011	17	0.00	0.00000 000	$\infty$

$$\left[ \begin{matrix} (-6)2 \\ 3 \end{matrix} \right] \quad \Re\psi(1+iy) = \ln y + f_4(y) \quad \left[ \begin{matrix} (-6)2 \\ 3 \end{matrix} \right]$$

$\langle y \rangle =$  nearest integer to  $y$ .