

A Table of $\int_{-\infty}^{\infty} e^{\frac{1}{2}i\pi\rho} \lambda^2 d\lambda$ for Complex Values of ρ

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A TABLE OF $\sqrt{(\frac{1}{2}\pi)} e^{\frac{1}{2}i\pi\rho^2} \int_{\rho}^{\infty} e^{-\frac{1}{2}i\pi\lambda^2} d\lambda$ FOR COMPLEX VALUES OF ρ

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In the theory of wave propagation the above function has applications for which ρ may be complex within a certain range of argument. Tables of the real and imaginary parts of the function are given to four decimal places, for values of $|\rho|$ from 0 to 0.80 at intervals of 0.01, and for values of $\arg \rho$ from 0° to 45° at intervals of 1° .

1. INTRODUCTION

The tabulation of functions for complex values of their argument is very seldom undertaken. This fact is, perhaps, not surprising in view of the enormous increase of labour involved when the argument has two degrees of freedom. It is, however, unfortunate that the widespread use of the complex variable in mathematical physics cannot be more adequately supported by numerical tables. The deficiency is particularly noticeable in wave theory; here the complex variable is an essential tool, but both the relatively simple form and the physical content of a result may be destroyed by the necessity of separating it into real and imaginary parts for the purpose of computation.

In the course of recent work on wave propagation, one of the authors has become convinced of the desirability of tabulating a function allied to the complex Fresnel integral for complex values of the argument. The tables given here are a partial fulfilment of this requirement. There follows a brief description of the function, together with an indication of the type of problem in which it will be useful.

2. THE FUNCTION

Although the general nature of a function for which numerical values are required may be clear, there is often some arbitrariness in the choice of the exact form to be adopted for tabulation. This is the case here. We have said that the function with which we are concerned is related to the complex Fresnel integral, but to-day this term might imply any one of the four following integrals:

$$\int_0^{\rho} e^{-i\lambda^2} d\lambda, \quad (1)$$

$$\int_0^{\rho} e^{-\frac{1}{2}i\pi\lambda^2} d\lambda, \quad (2)$$

$$\int_{\rho}^{\infty} e^{-i\lambda^2} d\lambda, \quad (3)$$

$$\int_{\rho}^{\infty} e^{-\frac{1}{2}i\pi\lambda^2} d\lambda, \quad (4)$$

omitting minor variations such as changing the sign of i . The distinction between (1) and (2) is unimportant, as is likewise that between (3) and (4). On the other hand, (3) and (4) arise more directly in physical applications than (1) and (2) respectively.

When the Fresnel integrals were originally introduced, only real values of the argument were considered. The functions (1) to (4) may be conveniently tabulated for real values of ρ ; but when ρ is complex within a range of argument to be discussed in the next section, (1) to (4) are not suitable for tabulation. The inclusion of an appropriate exponential factor, however, yields functions which are free of this defect; and, indeed, it is these new functions, rather than (1) to (4) themselves, which appear in physical problems.

The above considerations led to the choice of

$$G(\rho) = e^{i\pi\rho^2} \int_{\sqrt{(\frac{1}{2}\pi)\rho}}^{\infty} e^{-i\lambda^2} d\lambda = \sqrt{(\frac{1}{2}\pi)} e^{i\pi\rho^2} \int_{\rho}^{\infty} e^{-i\pi\lambda^2} d\lambda \quad (5)$$

as the function to be tabulated for complex values of ρ . The function of z obtained from (5) by writing $\rho = \sqrt{(2/\pi)} z$ has a slightly simpler mathematical form, but the adoption of ρ rather than z as the argument is in accord with most of the existing tables of Fresnel integrals.

3. THE RANGE OF ARGUMENT

In the physical applications which we have in mind it is found that $0 \leq \arg \rho \leq \frac{1}{4}\pi$, and the tabulation of (5) has therefore been confined to values of $\arg \rho$ within this range. The asymptotic expansion of (5) for large values of $|\rho|$ is then

$$G(\rho) \sim \frac{1}{i\sqrt{(2\pi)}\rho} \left[1 - \frac{1}{i\pi\rho^2} + \frac{1.3}{(i\pi\rho^2)^2} - \frac{1.3.5}{(i\pi\rho^2)^3} + \dots \right], \quad (6)$$

which shows how the behaviour of (5) as $|\rho| \rightarrow \infty$ compares favourably with that of the same function without the factor $\exp(\frac{1}{2}i\pi\rho^2)$.

The values of $|\rho|$ in the tabulation of (5) have been taken from 0 to 0.80. Since the values are not large it is convenient to write (5) in the form

$$G(\rho) = \frac{1}{2}\sqrt{(\pi)} e^{-i\pi} e^{i\pi\rho^2} - A(\rho), \quad (7)$$

where

$$A(\rho) = e^{i\pi\rho^2} \int_0^{\sqrt{(\frac{1}{2}\pi)\rho}} e^{-i\lambda^2} d\lambda. \quad (8)$$

For several particular values of $\arg \rho$, $A(\rho)$ is expressible in terms of standard functions. Thus, in addition to the case where ρ is real, we may note that

$$A(\sigma e^{-i\pi}) = e^{-i\pi} e^{i\pi\sigma^2} \int_0^{\sqrt{(\frac{1}{2}\pi)\sigma}} e^{-\lambda^2} d\lambda, \quad (9)$$

and

$$A(\sigma e^{i\pi}) = e^{i\pi} e^{-i\pi\sigma^2} \int_0^{\sqrt{(\frac{1}{2}\pi)\sigma}} e^{\lambda^2} d\lambda. \quad (10)$$

4. THE METHOD OF COMPUTATION

The table given is concerned with values of $|\rho|$ which are small or moderate, and the function was therefore expressed in the form (7). $A(\rho)$ was obtained from the expansion

$$e^{-i\pi\rho^2} A(\rho) = \sum_{n=0}^{\infty} \frac{(-i)^n}{n! (2n+1)} \left\{ \sqrt{(\frac{1}{2}\pi)} \rho \right\}^{2n+1}. \quad (11)$$

Since $\exp(\frac{1}{2}i\pi\rho^2)$ must be calculated in order to obtain the first term in (7), the series (11) was adopted in preference to the corresponding series for $A(\rho)$ itself, being just the more rapidly convergent of the two.

Writing $\rho = \sigma e^{i\alpha}$, pivotal values of the real and imaginary parts of (7) were obtained for values of σ from -0.2 to $+1.0$ at intervals of 0.1 , and for values of α from -10° to $+55^\circ$ at intervals of 5° . These pivotal values were calculated nominally to six decimal places, up to eleven terms of (11) being taken.

They were then checked by differencing, first in the σ direction and secondly in the α direction. Differencing, however, does not detect a systematic error, or a small error at the limits of a table, and it was decided to check, by an independent calculation, the values of $G(\rho)$ for $\alpha = 0^\circ, 45^\circ$ for all values of σ . The formulae used were:

(a) for $\alpha = 0^\circ$

$$\Re G(\rho) = \sqrt{(\frac{1}{2}\pi)} \left[\frac{1}{2}(\sin \frac{1}{2}\pi\sigma^2 + \cos \frac{1}{2}\pi\sigma^2) - \sin \frac{1}{2}\pi\sigma^2 \int_0^\sigma \sin \frac{1}{2}\pi t^2 dt - \cos \frac{1}{2}\pi\sigma^2 \int_0^\sigma \cos \frac{1}{2}\pi t^2 dt \right],$$

$$\Im G(\rho) = \sqrt{(\frac{1}{2}\pi)} \left[\frac{1}{2}(\sin \frac{1}{2}\pi\sigma^2 - \cos \frac{1}{2}\pi\sigma^2) - \sin \frac{1}{2}\pi\sigma^2 \int_0^\sigma \cos \frac{1}{2}\pi t^2 dt + \cos \frac{1}{2}\pi\sigma^2 \int_0^\sigma \sin \frac{1}{2}\pi t^2 dt \right];$$

(b) for $\alpha = 45^\circ$

$$\Re G(\rho) = e^{-\frac{1}{2}\pi\sigma^2} \sqrt{(\frac{1}{2}\pi)} \left[\frac{1}{2} - \frac{1}{\sqrt{2}} \int_0^\sigma e^{i\pi t^2} dt \right],$$

$$\Im G(\rho) = e^{-\frac{1}{2}\pi\sigma^2} \sqrt{(\frac{1}{2}\pi)} \left[\frac{1}{2} + \frac{1}{\sqrt{2}} \int_0^\sigma e^{i\pi t^2} dt \right].$$

A check, using formulae based on the U -series for Lommel's functions (Watson 1922, p. 545), was also made for $\alpha = -10^\circ, -5^\circ, +40^\circ, +50^\circ$ for $\sigma = -0.20, -0.10, +0.80, +0.90, +1.00$.

The differencing of the pivotal values was done on a National machine and five decimal places were kept. The set of differences with respect to α was used for subtabulation of the table to every degree of the argument. This was also done on a National machine using the method described by Comrie (1936, p. 104; 1932, p. 538). A second subtabulation in the σ direction was then performed in order to produce a final table to four decimal places at interval 0.01 in $|\rho|$. Five decimals were kept throughout up to the final stage of subtabulation, together with the requisite number of fictitious figures necessary to produce an exact check at the pivotal values.

5. APPLICATIONS

Since the earliest occurrence of Fresnel integrals in classical diffraction theory a number of other applications have arisen. A notable group of problems involving functions like (5) with, in general, complex values of ρ , is that for which wave propagation takes place over the surface of separation of different media. Some of these examples have been discussed by Ott (1943).

The function (5) appears frequently in wave theory for the following reason. Many problems in wave propagation may be solved by expressing the field as an angular spectrum

of plane waves (Booker & Clemmow 1950), and this representation leads to solutions in the form

$$\int_{-\infty}^{\infty} f(\lambda) e^{-k\lambda^2} d\lambda, \quad (12)$$

where k is real and large compared to 1. When $f(\lambda)$ has simple poles it may be shown that (12) can be reduced to a function like (5) by using a modification of the method of integration by steepest descents (Pauli 1938; Ott 1943; Clemmow 1950); the argument of this function will be complex unless the poles of $f(\lambda)$ happen to lie on the imaginary axis.

6. OTHER TABLES

In view of their many applications, the paucity of tables of Fresnel and allied integrals is disappointing (see Fletcher, Miller & Rosenhead 1946, p. 296). Even the Fresnel integrals for real values of the argument have received inadequate attention. In a recent exposition of rocket ballistics, Rankin (1949) introduced the function (5) multiplied by $\sqrt{(2/\pi)}$, and, for real values of ρ , found it necessary to compute a new table in order to obtain four figure accuracy with linear interpolation. Miller & Gordon (1931) give a lengthy discussion of some relevance which includes a valuable table of the integral (10) for real values of $x = \sqrt{(\frac{1}{2}\pi)}\sigma$, but for general complex values of the argument nothing is available; although the present table fills the gap to some extent, much yet remains to be done in this direction.

7. DESCRIPTION OF THE TABLE

The real and imaginary parts of the function

$$G(\rho) = \sqrt{(\frac{1}{2}\pi)} e^{i\frac{1}{2}\pi\rho^2} \int_{\rho}^{\infty} e^{-i\pi\lambda^2} d\lambda$$

are tabulated to four decimal places, for values of $\arg \rho$ from 0° to 45° at intervals of 1° , and for values of $|\rho|$ from 0 to 0.80 at intervals of 0.01. The table should be accurate to within one unit of the last figure.

For interpolation purposes, the second differences in both directions are negligible. For interpolation in one direction only, ordinary linear interpolation in one variable can be used.

For interpolation in the two variables $\sigma = |\rho|$ and $\alpha = \arg \rho$ convenient formulae are

$$\begin{aligned} G_{mn} &= G_{00} + m\Delta\sigma G_{00} + n\Delta\alpha G_{00} + mn(\Delta\sigma G_{01} - \Delta\sigma G_{00}) \\ &= G_{00} + m\Delta\sigma G_{00} + n\Delta\alpha G_{00} + mn(\Delta\alpha G_{10} - \Delta\alpha G_{00}), \end{aligned}$$

where

$$\begin{aligned} \Delta\sigma G_{00} &= G_{10} - G_{00}, & \Delta\alpha G_{00} &= G_{01} - G_{00}, \\ \Delta\sigma G_{01} &= G_{11} - G_{01}, & \Delta\alpha G_{10} &= G_{11} - G_{10}, \end{aligned}$$

and m, n are the fractions of the interval in the σ and α directions respectively for which the interpolated value is required (see figure 1).

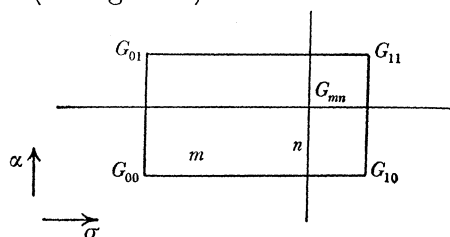


FIGURE 1

These formulae are equivalent to interpolating linearly in the α -direction between G_{00} and G_{01} , and between G_{10} and G_{11} , and then in the σ -direction between the resulting G_{0n} and G_{1n} to obtain G_{mn} . They are correct at all four points $(m, n) = (0, 0), (0, 1), (1, 0)$ and $(1, 1)$, not only at three of these points as a formula linear in m and in n would be. A check is provided by use of the formula

$$\begin{aligned} G_{mn} &= G_{11} - (1-m) \Delta\sigma G_{01} - (1-n) \Delta\alpha G_{10} - (1-m)(1-n) (\Delta\alpha G_{00} - \Delta\alpha G_{10}) \\ &= G_{11} - (1-m) \Delta\sigma G_{01} - (1-n) \Delta\alpha G_{10} - (1-m)(1-n) (\Delta\sigma G_{00} - \Delta\sigma G_{01}). \end{aligned}$$

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$\frac{\arg \rho}{ \rho }$	$\Re G(\rho)$				$\Im G(\rho)$			
	0°	1°	2°	4°	0°	1°	2°	4°
0.00	+0.6267	+0.6267	+0.6267	+0.6267	-0.6267	-0.6267	-0.6267	-0.6267
0.01	.6142	.6142	.6142	.6142	.6266	.6268	.6270	.6274
0.02	.6020	.6020	.6020	.6020	.6263	.6267	.6271	.6280
0.03	.5899	.5899	.5899	.5899	.6258	.6264	.6271	.6283
0.04	.5781	.5781	.5780	.5780	.6252	.6260	.6268	.6285
0.05	+0.5664	+0.5664	+0.5663	+0.5663	-0.6244	-0.6254	-0.6264	-0.6284
0.06	.5550	.5549	.5547	.5547	.6234	.6246	.6258	.6282
0.07	.5437	.5436	.5435	.5433	.6223	.6236	.6250	.6278
0.08	.5327	.5325	.5323	.5321	.6210	.6225	.6241	.6272
0.09	.5218	.5216	.5214	.5211	.6196	.6213	.6230	.6264
0.10	+0.5111	+0.5108	+0.5106	+0.5102	-0.6181	-0.6199	-0.6218	-0.6255
0.11	.5006	.5003	.5000	.4995	.6164	.6184	.6204	.6244
0.12	.4903	.4899	.4896	.4890	.6146	.6167	.6189	.6232
0.13	.4802	.4797	.4793	.4786	.6127	.6150	.6173	.6219
0.14	.4702	.4697	.4693	.4685	.6107	.6131	.6155	.6204
0.15	+0.4605	+0.4599	+0.4594	+0.4585	-0.6086	-0.6111	-0.6137	-0.6188
0.16	.4509	.4503	.4497	.4486	.6063	.6090	.6117	.6171
0.17	.4415	.4408	.4402	.4390	.6040	.6068	.6096	.6152
0.18	.4323	.4315	.4308	.4295	.6016	.6045	.6074	.6133
0.19	.4232	.4224	.4216	.4202	.5991	.6021	.6051	.6112
0.20	+0.4144	+0.4135	+0.4126	+0.4110	-0.5966	-0.5997	-0.6028	-0.6090
0.21	.4057	.4047	.4038	.4020	.5939	.5971	.6003	.6068
0.22	.3971	.3961	.3951	.3932	.5912	.5945	.5978	.6044
0.23	.3888	.3877	.3866	.3845	.5884	.5918	.5951	.6020
0.24	.3806	.3794	.3782	.3760	.5856	.5890	.5925	.5995
0.25	+0.3725	+0.3713	+0.3700	+0.3677	-0.5827	-0.5862	-0.5897	-0.5969
0.26	.3647	.3633	.3620	.3595	.5797	.5833	.5869	.5942
0.27	.3569	.3555	.3541	.3515	.5767	.5804	.5840	.5914
0.28	.3494	.3479	.3464	.3436	.5737	.5774	.5811	.5886
0.29	.3420	.3404	.3389	.3359	.5706	.5743	.5781	.5858
0.30	+0.3347	+0.3331	+0.3315	+0.3283	-0.5675	-0.5712	-0.5751	-0.5828
0.31	.3276	.3259	.3242	.3209	.5643	.5681	.5720	.5799
0.32	.3206	.3188	.3171	.3136	.5611	.5649	.5689	.5768
0.33	.3138	.3120	.3101	.3065	.5578	.5617	.5657	.5737
0.34	.3071	.3052	.3033	.2995	.5546	.5585	.5625	.5706
0.35	+0.3006	+0.2986	+0.2966	+0.2927	-0.5513	-0.5553	-0.5593	-0.5675
0.36	.2942	.2921	.2900	.2860	.5480	.5520	.5560	.5643
0.37	.2879	.2858	.2836	.2794	.5446	.5487	.5527	.5610
0.38	.2818	.2796	.2773	.2730	.5413	.5453	.5494	.5578
0.39	.2758	.2735	.2712	.2667	.5379	.5420	.5461	.5545
0.40	+0.2699	+0.2675	+0.2652	+0.2605	-0.5345	-0.5386	-0.5427	-0.5512

ON THE COMPLEX VALUES OF ρ

$ \rho $	$\arg \rho$	$\Re G(\rho)$				$\Im G(\rho)$				
		0°	1°	2°	3°	4°	0°	1°	2°	3°
0.40	+0.2699	+0.2675	+0.2652	+0.2628	+0.2605	-0.5345	-0.5386	-0.5427	-0.5469	-0.5512
.41	.2641	.2617	.2593	.2569	.2545	.5311	.5352	.5394	.5436	.5478
.42	.2585	.2560	.2535	.2510	.2486	.5277	.5318	.5360	.5402	.5445
.43	.2530	.2504	.2479	.2453	.2428	.5243	.5284	.5326	.5368	.5411
.44	.2476	.2450	.2424	.2397	.2371	.5209	.5250	.5292	.5334	.5377
0.45	+0.2423	+0.2396	+0.2370	+0.2343	+0.2316	-0.5175	-0.5216	-0.5258	-0.5300	-0.5343
.46	.2372	.2344	.2317	.2289	.2262	.5140	.5181	.5223	.5266	.5308
.47	.2321	.2293	.2265	.2237	.2209	.5106	.5147	.5189	.5231	.5274
.48	.2272	.2243	.2214	.2186	.2157	.5072	.5113	.5155	.5197	.5240
.49	.2224	.2194	.2165	.2135	.2106	.5038	.5079	.5120	.5162	.5205
0.50	+0.2176	+0.2146	+0.2117	+0.2086	+0.2056	-0.5003	-0.5044	-0.5086	-0.5128	-0.5171
.51	.2130	.2100	.2069	.2038	.2008	.4969	.5010	.5052	.5093	.5136
.52	.2085	.2054	.2023	.1992	.1960	.4935	.4976	.5017	.5059	.5101
.53	.2041	.2009	.1978	.1946	.1914	.4901	.4942	.4983	.5025	.5067
.54	.1997	.1965	.1933	.1901	.1868	.4867	.4908	.4949	.4990	.5032
0.55	+0.1955	+0.1923	+0.1890	+0.1857	+0.1824	-0.4833	-0.4874	-0.4915	-0.4956	-0.4998
.56	.1914	.1881	.1848	.1814	.1781	.4800	.4840	.4880	.4922	.4963
.57	.1873	.1840	.1806	.1772	.1738	.4766	.4806	.4846	.4887	.4929
.58	.1834	.1800	.1766	.1731	.1697	.4732	.4772	.4813	.4853	.4894
.59	.1795	.1761	.1726	.1691	.1656	.4699	.4739	.4779	.4819	.4860
0.60	+0.1757	+0.1723	+0.1687	+0.1652	+0.1617	-0.4666	-0.4705	-0.4745	-0.4785	-0.4826
.61	.1720	.1685	.1650	.1614	.1578	.4633	.4672	.4712	.4752	.4792
.62	.1684	.1649	.1613	.1576	.1540	.4600	.4639	.4678	.4718	.4758
.63	.1649	.1613	.1576	.1540	.1503	.4567	.4606	.4645	.4684	.4724
.64	.1614	.1578	.1541	.1504	.1467	.4535	.4573	.4612	.4651	.4691
0.65	+0.1581	+0.1544	+0.1507	+0.1469	+0.1431	-0.4502	-0.4540	-0.4579	-0.4618	-0.4657
.66	.1548	.1510	.1473	.1435	.1397	.4470	.4508	.4546	.4585	.4624
.67	.1515	.1478	.1440	.1402	.1363	.4438	.4476	.4514	.4552	.4591
.68	.1484	.1446	.1408	.1369	.1330	.4406	.4444	.4481	.4519	.4558
.69	.1453	.1415	.1376	.1337	.1298	.4375	.4412	.4449	.4487	.4525
0.70	+0.1423	+0.1384	+0.1346	+0.1306	+0.1267	-0.4343	-0.4380	-0.4417	-0.4454	-0.4492
.71	.1393	.1355	.1315	.1276	.1236	.4312	.4349	.4385	.4422	.4460
.72	.1364	.1325	.1286	.1246	.1206	.4281	.4317	.4354	.4390	.4427
.73	.1336	.1297	.1257	.1217	.1177	.4250	.4286	.4322	.4359	.4395
.74	.1309	.1269	.1229	.1189	.1148	.4220	.4255	.4291	.4327	.4363
0.75	+0.1282	+0.1242	+0.1202	+0.1161	+0.1120	-0.4190	-0.4225	-0.4260	-0.4296	-0.4332
.76	.1255	.1216	.1175	.1134	.1093	.4160	.4194	.4229	.4265	.4300
.77	.1230	.1190	.1149	.1108	.1066	.4130	.4164	.4199	.4234	.4269
.78	.1205	.1164	.1123	.1082	.1040	.4100	.4134	.4168	.4203	.4238
.79	.1180	.1139	.1098	.1057	.1015	.4071	.4104	.4138	.4172	.4207
0.80	+0.1156	+0.1115	+0.1074	+0.1032	+0.0990	-0.4042	-0.4075	-0.4108	-0.4142	-0.4176

ON THE COMPLEX VALUES OF ρ

$ \rho $	$\arg \rho$					$\Re G(\rho)$					$\Im G(\rho)$				
	5°	6°	7°	8°	9°	5°	6°	7°	8°	9°	5°	6°	7°	8°	9°
0.40	+0.2582	+0.2559	+0.2536	+0.2513	+0.2490	-0.5554	-0.5598	-0.5642	-0.5686	-0.5731					
41	.2521	.2497	.2473	.2450	.2426	.5521	.5565	.5609	.5653	.5699					
42	.2461	.2436	.2412	.2387	.2363	.5488	.5531	.5575	.5620	.5666					
43	.2402	.2377	.2352	.2327	.2301	.5454	.5498	.5542	.5587	.5632					
44	.2345	.2319	.2293	.2267	.2241	.5420	.5464	.5508	.5553	.5599					
0.45	+0.2289	+0.2262	+0.2235	+0.2209	+0.2182	-0.5386	-0.5430	-0.5474	-0.5519	-0.5565					
46	.2234	.2207	.2179	.2151	.2124	.5352	.5395	.5440	.5485	.5531					
47	.2180	.2152	.2124	.2096	.2067	.5317	.5361	.5406	.5450	.5496					
48	.2128	.2099	.2070	.2041	.2012	.5283	.5327	.5371	.5416	.5462					
49	.2076	.2047	.2017	.1987	.1958	.5248	.5292	.5336	.5381	.5427					
0.50	+0.2026	+0.1996	+0.1966	+0.1935	+0.1905	-0.5214	-0.5257	-0.5302	-0.5346	-0.5392					
51	.1977	.1946	.1915	.1884	.1853	.5179	.5223	.5267	.5311	.5357					
52	.1929	.1897	.1866	.1834	.1802	.5144	.5188	.5232	.5276	.5322					
53	.1882	.1850	.1817	.1785	.1752	.5110	.5153	.5197	.5241	.5286					
54	.1836	.1803	.1770	.1737	.1704	.5075	.5118	.5162	.5206	.5251					
0.55	+0.1791	+0.1757	+0.1724	+0.1690	+0.1656	-0.5040	-0.5083	-0.5127	-0.5171	-0.5215					
56	.1747	.1713	.1679	.1644	.1610	.5005	.5048	.5092	.5135	.5180					
57	.1704	.1669	.1635	.1600	.1565	.4971	.5013	.5057	.5100	.5144					
58	.1662	.1627	.1592	.1556	.1520	.4936	.4979	.5021	.5065	.5109					
59	.1621	.1585	.1549	.1513	.1477	.4902	.4944	.4987	.5030	.5073					
0.60	+0.1581	+0.1545	+0.1508	+0.1472	+0.1435	-0.4867	-0.4909	-0.4952	-0.4995	-0.5038					
61	.1541	.1505	.1468	.1431	.1393	.4833	.4875	.4917	.4959	.5003					
62	.1503	.1466	.1429	.1391	.1353	.4799	.4840	.4882	.4924	.4967					
63	.1466	.1428	.1390	.1352	.1313	.4765	.4806	.4847	.4889	.4932					
64	.1429	.1391	.1353	.1314	.1275	.4731	.4772	.4813	.4854	.4897					
0.65	+0.1393	+0.1355	+0.1316	+0.1277	+0.1237	-0.4697	-0.4737	-0.4778	-0.4820	-0.4861					
66	.1358	.1320	.1280	.1241	.1200	.4663	.4703	.4744	.4785	.4826					
67	.1324	.1285	.1245	.1205	.1165	.4630	.4670	.4710	.4750	.4792					
68	.1291	.1251	.1211	.1171	.1130	.4597	.4636	.4676	.4716	.4757					
69	.1258	.1218	.1178	.1137	.1095	.4563	.4602	.4642	.4682	.4722					
0.70	+0.1227	+0.1186	+0.1145	+0.1104	+0.1062	-0.4530	-0.4569	-0.4608	-0.4648	-0.4688					
71	.1196	.1155	.1114	.1072	.1029	.4497	.4536	.4574	.4614	.4653					
72	.1165	.1124	.1082	.1040	.0998	.4465	.4503	.4541	.4580	.4619					
73	.1136	.1094	.1052	.1010	.0967	.4432	.4470	.4508	.4546	.4585					
74	.1107	.1065	.1023	.0980	.0936	.4400	.4437	.4475	.4513	.4551					
0.75	+0.1078	+0.1036	+0.0994	+0.0951	+0.0907	-0.4368	-0.4405	-0.4442	-0.4479	-0.4517					
76	.1051	.1008	.0966	.0922	.0878	.4336	.4372	.4409	.4446	.4484					
77	.1024	.0981	.0938	.0894	.0850	.4304	.4340	.4377	.4413	.4450					
78	.0998	.0955	.0911	.0867	.0823	.4273	.4308	.4344	.4381	.4417					
79	.0972	.0929	.0885	.0841	.0796	.4242	.4277	.4312	.4348	.4384					
0.80	+0.0947	+0.0904	+0.0860	+0.0815	+0.0770	-0.4211	-0.4245	-0.4281	-0.4316	-0.4352					

ρ	$\Re G(\rho)$				$\Im G(\rho)$					
	10°	11°	12°	13°	14°	10°	11°	12°	13°	14°
0.00	+0.6267	+0.6267	+0.6267	+0.6267	+0.6267	-0.6267	-0.6267	-0.6267	-0.6267	-0.6267
0.01	.6144	.6144	.6145	.6145	.6145	.6287	.6289	.6291	.6294	.6296
0.02	.6022	.6023	.6023	.6024	.6025	.6305	.6309	.6314	.6318	.6322
0.03	.5902	.5903	.5904	.5905	.5906	.6321	.6327	.6333	.6340	.6346
0.04	.5783	.5784	.5785	.5786	.5787	.6334	.6342	.6351	.6359	.6367
0.05	+0.5665	+0.5666	+0.5667	+0.5668	+0.5670	-0.6345	-0.6356	-0.6366	-0.6376	-0.6386
0.06	.5549	.5549	.5551	.5552	.5553	.6354	.6366	.6378	.6391	.6403
0.07	.5433	.5434	.5435	.5437	.5438	.6361	.6375	.6389	.6403	.6417
0.08	.5320	.5320	.5321	.5322	.5324	.6366	.6381	.6397	.6413	.6429
0.09	.5208	.5208	.5209	.5210	.5211	.6368	.6386	.6404	.6421	.6439
0.10	+0.5097	+0.5097	+0.5097	+0.5098	+0.5099	-0.6369	-0.6389	-0.6408	-0.6427	-0.6447
0.11	.4987	.4987	.4987	.4988	.4988	.6368	.6389	.6410	.6431	.6452
0.12	.4879	.4879	.4878	.4879	.4879	.6365	.6388	.6410	.6433	.6456
0.13	.4773	.4772	.4771	.4771	.4771	.6361	.6385	.6409	.6433	.6458
0.14	.4668	.4666	.4665	.4664	.4664	.6355	.6380	.6406	.6431	.6457
0.15	+0.4565	+0.4563	+0.4561	+0.4559	+0.4558	-0.6347	-0.6374	-0.6401	-0.6428	-0.6455
0.16	.4463	.4460	.4458	.4456	.4454	.6337	.6365	.6394	.6423	.6452
0.17	.4362	.4359	.4356	.4354	.4352	.6326	.6356	.6386	.6416	.6446
0.18	.4263	.4259	.4256	.4253	.4250	.6314	.6345	.6376	.6407	.6439
0.19	.4166	.4161	.4157	.4153	.4150	.6300	.6332	.6365	.6397	.6430
0.20	+0.4070	+0.4065	+0.4060	+0.4056	+0.4051	-0.6285	-0.6318	-0.6352	-0.6386	-0.6420
0.21	.3976	.3970	.3964	.3959	.3954	.6268	.6303	.6338	.6373	.6408
0.22	.3883	.3876	.3870	.3864	.3858	.6251	.6286	.6322	.6358	.6395
0.23	.3792	.3784	.3777	.3770	.3764	.6232	.6269	.6305	.6342	.6380
0.24	.3702	.3694	.3686	.3678	.3671	.6212	.6250	.6287	.6325	.6364
0.25	+0.3614	+0.3605	+0.3596	+0.3587	+0.3579	-0.6191	-0.6229	-0.6268	-0.6307	-0.6347
0.26	.3527	.3517	.3508	.3498	.3489	.6169	.6208	.6248	.6288	.6328
0.27	.3442	.3431	.3421	.3411	.3401	.6146	.6186	.6226	.6267	.6308
0.28	.3358	.3347	.3335	.3324	.3314	.6122	.6163	.6204	.6246	.6288
0.29	.3276	.3264	.3251	.3239	.3228	.6097	.6139	.6181	.6223	.6266
0.30	+0.3196	+0.3182	+0.3169	+0.3156	+0.3144	-0.6072	-0.6114	-0.6156	-0.6199	-0.6243
0.31	.3116	.3102	.3088	.3074	.3061	.6045	.6088	.6131	.6175	.6219
0.32	.3039	.3023	.3008	.2994	.2979	.6018	.6061	.6105	.6149	.6194
0.33	.2962	.2946	.2930	.2915	.2899	.5990	.6034	.6078	.6123	.6168
0.34	.2887	.2870	.2853	.2837	.2821	.5961	.6005	.6050	.6095	.6141
0.35	+0.2814	+0.2796	+0.2778	+0.2761	+0.2744	-0.5932	-0.5976	-0.6022	-0.6068	-0.6114
0.36	.2742	.2723	.2704	.2686	.2668	.5902	.5947	.5993	.6039	.6086
0.37	.2671	.2652	.2632	.2613	.2594	.5871	.5917	.5963	.6009	.6057
0.38	.2602	.2581	.2561	.2541	.2521	.5840	.5886	.5932	.5979	.6027
0.39	.2534	.2513	.2491	.2470	.2449	.5809	.5855	.5901	.5949	.5997
0.40	+0.2468	+0.2445	+0.2423	+0.2401	+0.2379	-0.5777	-0.5823	-0.5870	-0.5917	-0.5966

ON THE COMPLEX VALUES OF ρ

$\frac{\arg \rho}{ \rho }$	$\Re G(\rho)$				$\Im G(\rho)$					
	10°	11°	12°	13°	14°	10°	11°	12°	13°	14°
0.40	+0.2468	+0.2445	+0.2423	+0.2401	+0.2379	-0.5777	-0.5823	-0.5870	-0.5917	-0.5966
.41	.2403	.2379	.2356	.2333	.2310	.5744	.5791	.5838	.5886	.5934
.42	.2339	.2315	.2291	.2267	.2243	.5712	.5758	.5805	.5853	.5902
.43	.2276	.2251	.2226	.2202	.2177	.5678	.5725	.5772	.5821	.5869
.44	.2215	.2189	.2163	.2138	.2112	.5645	.5692	.5739	.5787	.5836
0.45	+0.2155	+0.2128	+0.2102	+0.2075	+0.2049	-0.5611	-0.5658	-0.5705	-0.5754	-0.5803
.46	.2096	.2069	.2041	.2014	.1987	.5577	.5624	.5671	.5720	.5769
.47	.2039	.2011	.1982	.1954	.1926	.5542	.5589	.5637	.5685	.5734
.48	.1983	.1954	.1925	.1895	.1866	.5508	.5555	.5602	.5651	.5700
.49	.1928	.1898	.1868	.1838	.1808	.5473	.5520	.5567	.5616	.5665
0.50	+0.1874	+0.1843	+0.1813	+0.1782	+0.1751	-0.5438	-0.5485	-0.5532	-0.5580	-0.5629
.51	.1821	.1790	.1758	.1727	.1695	.5403	.5449	.5497	.5545	.5594
.52	.1770	.1738	.1705	.1673	.1640	.5367	.5414	.5461	.5509	.5558
.53	.1720	.1687	.1654	.1620	.1587	.5332	.5378	.5425	.5473	.5522
.54	.1670	.1637	.1603	.1569	.1535	.5296	.5343	.5390	.5437	.5485
0.55	+0.1622	+0.1588	+0.1553	+0.1518	+0.1484	-0.5261	-0.5307	-0.5354	-0.5401	-0.5449
.56	.1575	.1540	.1505	.1469	.1434	.5225	.5271	.5317	.5365	.5412
.57	.1529	.1493	.1457	.1421	.1385	.5189	.5235	.5281	.5328	.5376
.58	.1484	.1448	.1411	.1374	.1337	.5154	.5199	.5245	.5292	.5339
.59	.1440	.1403	.1366	.1328	.1290	.5118	.5163	.5209	.5255	.5302
0.60	+0.1397	+0.1360	+0.1322	+0.1284	+0.1245	-0.5082	-0.5127	-0.5172	-0.5218	-0.5265
.61	.1355	.1317	.1279	.1240	.1200	.5046	.5091	.5136	.5182	.5228
.62	.1314	.1276	.1237	.1197	.1157	.5011	.5055	.5100	.5145	.5191
.63	.1274	.1235	.1195	.1155	.1115	.4975	.5019	.5063	.5108	.5154
.64	.1235	.1195	.1155	.1114	.1073	.4939	.4983	.5027	.5072	.5117
0.65	+0.1197	+0.1157	+0.1116	+0.1075	+0.1033	-0.4904	-0.4947	-0.4991	-0.5035	-0.5080
.66	.1160	.1119	.1078	.1036	.0993	.4869	.4911	.4955	.4998	.5043
.67	.1124	.1082	.1040	.0998	.0955	.4833	.4876	.4918	.4962	.5006
.68	.1088	.1046	.1004	.0961	.0917	.4798	.4840	.4882	.4925	.4969
.69	.1054	.1011	.0968	.0925	.0881	.4763	.4804	.4846	.4889	.4932
0.70	+0.1020	+0.0977	+0.0934	+0.0890	+0.0845	-0.4728	-0.4769	-0.4811	-0.4853	-0.4896
.71	.0987	.0943	.0900	.0855	.0810	.4693	.4734	.4775	.4817	.4859
.72	.0955	.0911	.0867	.0822	.0776	.4659	.4699	.4740	.4781	.4823
.73	.0923	.0879	.0834	.0789	.0743	.4624	.4664	.4704	.4745	.4786
.74	.0892	.0848	.0803	.0757	.0711	.4590	.4629	.4669	.4709	.4750
0.75	+0.0863	+0.0818	+0.0772	+0.0726	+0.0679	-0.4556	-0.4595	-0.4634	-0.4674	-0.4714
.76	.0833	.0788	.0742	.0696	.0649	.4522	.4560	.4599	.4638	.4678
.77	.0805	.0759	.0713	.0666	.0619	.4488	.4526	.4564	.4603	.4643
.78	.0777	.0731	.0685	.0638	.0590	.4454	.4492	.4530	.4568	.4607
.79	.0750	.0704	.0657	.0610	.0561	.4421	.4458	.4496	.4533	.4572
0.80	+0.0724	+0.0677	+0.0630	+0.0582	+0.0534	-0.4388	-0.4424	-0.4461	-0.4499	-0.4537

$\frac{\arg \rho}{ \rho }$	$\mathcal{R} G(\rho)$					$\mathcal{I} G(\rho)$				
	15°	16°	17°	18°	19°	15°	16°	17°	18°	19°
0.00	+0.6267	+0.6267	+0.6267	+0.6267	+0.6267	-0.6267	-0.6267	-0.6267	-0.6267	-0.6267
0.01	.6146	.6146	.6147	.6148	.6148	.6298	.6300	.6302	.6304	.6306
0.02	.6026	.6027	.6028	.6029	.6030	.6326	.6330	.6335	.6339	.6343
0.03	.5907	.5908	.5910	.5911	.5913	.6352	.6358	.6364	.6371	.6377
0.04	.5789	.5790	.5792	.5794	.5796	.6375	.6384	.6392	.6400	.6408
0.05	+0.5671	+0.5673	+0.5675	+0.5677	+0.5680	-0.6396	-0.6407	-0.6417	-0.6427	-0.6437
0.06	.5555	.5557	.5559	.5561	.5564	.6415	.6427	.6439	.6451	.6463
0.07	.5440	.5442	.5444	.5446	.5449	.6431	.6445	.6459	.6473	.6487
0.08	.5325	.5327	.5329	.5332	.5335	.6445	.6461	.6477	.6493	.6508
0.09	.5212	.5214	.5216	.5219	.5221	.6457	.6474	.6492	.6510	.6527
0.10	+0.5100	+0.5102	+0.5104	+0.5106	+0.5109	-0.6466	-0.6486	-0.6505	-0.6525	-0.6544
0.11	.4989	.4991	.4992	.4994	.4997	.6473	.6495	.6516	.6537	.6558
0.12	.4880	.4881	.4882	.4884	.4886	.6479	.6502	.6525	.6548	.6571
0.13	.4771	.4772	.4773	.4774	.4776	.6482	.6507	.6531	.6556	.6581
0.14	.4664	.4664	.4665	.4666	.4667	.6483	.6509	.6536	.6562	.6588
0.15	+0.4558	+0.4558	+0.4558	+0.4559	+0.4560	-0.6483	-0.6511	-0.6538	-0.6566	-0.6594
0.16	.4453	.4452	.4452	.4452	.4453	.6480	.6510	.6539	.6568	.6598
0.17	.4350	.4349	.4348	.4347	.4347	.6476	.6507	.6538	.6569	.6600
0.18	.4248	.4246	.4244	.4243	.4243	.6471	.6503	.6535	.6567	.6600
0.19	.4147	.4145	.4142	.4141	.4140	.6463	.6496	.6530	.6564	.6598
0.20	+0.4048	+0.4045	+0.4042	+0.4039	+0.4038	-0.6454	-0.6489	-0.6523	-0.6558	-0.6594
0.21	.3950	.3946	.3942	.3939	.3937	.6443	.6479	.6515	.6552	.6588
0.22	.3853	.3848	.3844	.3840	.3837	.6431	.6468	.6505	.6543	.6581
0.23	.3758	.3752	.3747	.3743	.3739	.6418	.6456	.6494	.6533	.6572
0.24	.3664	.3658	.3652	.3647	.3642	.6403	.6442	.6481	.6521	.6561
0.25	+0.3572	+0.3565	+0.3558	+0.3552	+0.3546	-0.6386	-0.6427	-0.6467	-0.6508	-0.6549
0.26	.3481	.3473	.3465	.3458	.3451	.6369	.6410	.6452	.6494	.6536
0.27	.3391	.3382	.3374	.3366	.3358	.6350	.6392	.6435	.6478	.6521
0.28	.3303	.3293	.3284	.3275	.3266	.6330	.6373	.6416	.6460	.6504
0.29	.3217	.3206	.3196	.3186	.3176	.6309	.6353	.6397	.6442	.6487
0.30	+0.3131	+0.3120	+0.3108	+0.3098	+0.3087	-0.6287	-0.6331	-0.6376	-0.6422	-0.6468
0.31	.3048	.3035	.3023	.3011	.2999	.6263	.6309	.6354	.6401	.6447
0.32	.2965	.2952	.2938	.2925	.2913	.6239	.6285	.6331	.6378	.6426
0.33	.2884	.2870	.2855	.2842	.2828	.6214	.6260	.6308	.6355	.6403
0.34	.2805	.2789	.2774	.2759	.2745	.6188	.6235	.6283	.6331	.6380
0.35	+0.2727	+0.2710	+0.2694	+0.2678	+0.2662	-0.6161	-0.6208	-0.6257	-0.6305	-0.6355
0.36	.2650	.2632	.2615	.2598	.2582	.6133	.6181	.6230	.6279	.6329
0.37	.2575	.2556	.2538	.2520	.2502	.6104	.6153	.6202	.6252	.6302
0.38	.2501	.2481	.2462	.2443	.2424	.6075	.6124	.6174	.6224	.6275
0.39	.2428	.2408	.2388	.2367	.2348	.6045	.6094	.6144	.6195	.6246
0.40	+0.2357	+0.2336	+0.2314	+0.2293	+0.2272	-0.6014	-0.6064	-0.6114	-0.6165	-0.6217

ON THE COMPLEX VALUES OF ρ

$\frac{\arg \rho}{ \rho }$	$\Re G(\rho)$					$\Im G(\rho)$				
	15°	16°	17°	18°	19°	15°	16°	17°	18°	19°
0.40	+0.2357	+0.2336	+0.2314	+0.2293	+0.2272	-0.6014	-0.6064	-0.6114	-0.6165	-0.6217
.41	.2288	.2265	.2243	.2221	.2199	.5983	.6033	.6083	.6135	.6187
.42	.2219	.2196	.2172	.2149	.2126	.5951	.6001	.6052	.6103	.6156
.43	.2152	.2128	.2103	.2079	.2055	.5919	.5969	.6020	.6072	.6124
.44	.2087	.2061	.2036	.2010	.1985	.5886	.5936	.5987	.6039	.6092
0.45	+0.2022	+0.1996	+0.1969	+0.1943	+0.1917	-0.5852	-0.5903	-0.5954	-0.6006	-0.6059
.46	.1959	.1932	.1904	.1877	.1850	.5818	.5869	.5920	.5972	.6025
.47	.1897	.1869	.1841	.1812	.1784	.5784	.5835	.5886	.5938	.5991
.48	.1837	.1808	.1778	.1749	.1720	.5749	.5800	.5851	.5903	.5956
.49	.1778	.1748	.1717	.1687	.1657	.5714	.5765	.5816	.5868	.5921
0.50	+0.1720	+0.1689	+0.1658	+0.1626	+0.1595	-0.5679	-0.5729	-0.5781	-0.5833	-0.5885
.51	.1663	.1631	.1599	.1567	.1535	.5643	.5693	.5745	.5797	.5849
.52	.1608	.1575	.1542	.1509	.1476	.5607	.5657	.5708	.5760	.5813
.53	.1553	.1520	.1486	.1452	.1418	.5571	.5621	.5672	.5724	.5776
.54	.1500	.1466	.1431	.1396	.1361	.5535	.5584	.5635	.5687	.5739
0.55	+0.1448	+0.1413	+0.1377	+0.1342	+0.1306	-0.5498	-0.5548	-0.5598	-0.5649	-0.5701
.56	.1398	.1361	.1325	.1288	.1252	.5461	.5511	.5561	.5612	.5664
.57	.1348	.1311	.1274	.1236	.1199	.5424	.5473	.5523	.5574	.5626
.58	.1300	.1262	.1224	.1185	.1147	.5387	.5436	.5486	.5536	.5587
.59	.1252	.1214	.1175	.1136	.1096	.5350	.5398	.5448	.5498	.5549
0.60	+0.1206	+0.1167	+0.1127	+0.1087	+0.1047	-0.5313	-0.5361	-0.5410	-0.5460	-0.5510
.61	.1161	.1121	.1081	.1040	.9999	.5275	.5323	.5372	.5421	.5472
.62	.1117	.1076	.1035	.9993	.9952	.5238	.5285	.5334	.5383	.5433
.63	.1074	.1032	.9991	.9948	.9906	.5200	.5248	.5296	.5344	.5394
.64	.1032	.9990	.9947	.9904	.9861	.5163	.5210	.5257	.5306	.5355
0.65	+0.0991	+0.0948	+0.0905	+0.0861	+0.0817	-0.5126	-0.5172	-0.5219	-0.5267	-0.5316
.66	.0951	.0907	.0863	.0819	.0774	.5088	.5134	.5181	.5228	.5276
.67	.0912	.0868	.0823	.0778	.0733	.5051	.5096	.5142	.5189	.5237
.68	.0873	.0829	.0784	.0738	.0692	.5013	.5059	.5104	.5151	.5198
.69	.0836	.0791	.0745	.0699	.0652	.4976	.5021	.5066	.5112	.5159
0.70	+0.0800	+0.0754	+0.0708	+0.0661	+0.0614	-0.4939	-0.4983	-0.5028	-0.5073	-0.5120
.71	.0765	.0719	.0672	.0624	.0576	.4902	.4946	.4990	.5035	.5080
.72	.0730	.0684	.0636	.0588	.0539	.4865	.4908	.4952	.4996	.5041
.73	.0697	.0649	.0602	.0553	.0504	.4828	.4871	.4914	.4958	.5002
.74	.0664	.0616	.0568	.0519	.0469	.4792	.4834	.4876	.4920	.4963
0.75	+0.0632	+0.0584	+0.0535	+0.0486	+0.0435	-0.4755	-0.4797	-0.4839	-0.4881	-0.4925
.76	.0601	.0552	.0503	.0453	.0402	.4719	.4760	.4801	.4843	.4886
.77	.0571	.0522	.0472	.0422	.0370	.4682	.4723	.4764	.4805	.4848
.78	.0541	.0492	.0442	.0391	.0339	.4646	.4686	.4727	.4768	.4809
.79	.0512	.0463	.0412	.0361	.0309	.4610	.4650	.4690	.4730	.4771
0.80	+0.0485	+0.0434	+0.0384	+0.0332	+0.0279	-0.4575	-0.4614	-0.4653	-0.4693	-0.4733

$\arg \rho$ $ \rho $	$\mathcal{R}G(\rho)$				$\mathcal{I}G(\rho)$					
	20°	21°	22°	23°	24°	20°	21°	22°	23°	24°
0.00	+0.6267	+0.6267	+0.6267	+0.6267	+0.6267	-0.6267	-0.6267	-0.6267	-0.6267	-0.6267
0.01	.6149	.6150	.6150	.6151	.6152	.6308	.6310	.6312	.6314	.6316
0.02	.6032	.6033	.6034	.6036	.6037	.6347	.6351	.6355	.6359	.6363
0.03	.5915	.5917	.5919	.5921	.5923	.6383	.6389	.6395	.6401	.6407
0.04	.5798	.5800	.5803	.5806	.5808	.6416	.6424	.6432	.6441	.6449
0.05	+0.5682	+0.5685	+0.5688	+0.5691	+0.5694	-0.6447	-0.6457	-0.6467	-0.6477	-0.6487
0.06	.5567	.5570	.5573	.5576	.5580	.6475	.6487	.6499	.6511	.6523
0.07	.5452	.5455	.5458	.5462	.5466	.6501	.6515	.6529	.6543	.6557
0.08	.5338	.5341	.5344	.5348	.5352	.6524	.6540	.6556	.6572	.6588
0.09	.5224	.5227	.5231	.5235	.5239	.6545	.6563	.6581	.6598	.6616
0.10	+0.5111	+0.5115	+0.5118	+0.5122	+0.5126	-0.6564	-0.6583	-0.6603	-0.6623	-0.6642
0.11	.5000	.5003	.5006	.5010	.5014	.6580	.6601	.6623	.6644	.6666
0.12	.4888	.4891	.4895	.4898	.4902	.6594	.6617	.6640	.6663	.6687
0.13	.4778	.4781	.4784	.4787	.4791	.6605	.6630	.6655	.6680	.6705
0.14	.4669	.4672	.4674	.4677	.4681	.6615	.6642	.6668	.6695	.6722
0.15	+0.4561	+0.4563	+0.4565	+0.4568	+0.4571	-0.6632	-0.6651	-0.6679	-0.6707	-0.6736
0.16	.4454	.4455	.4457	.4460	.4462	.6628	.6657	.6687	.6718	.6748
0.17	.4348	.4349	.4350	.4352	.4354	.6631	.6662	.6694	.6726	.6757
0.18	.4243	.4243	.4244	.4245	.4247	.6632	.6665	.6698	.6732	.6765
0.19	.4139	.4139	.4139	.4140	.4141	.6632	.6666	.6701	.6735	.6770
0.20	+0.4036	+0.4035	+0.4035	+0.4035	+0.4035	-0.6629	-0.6665	-0.6701	-0.6737	-0.6774
0.21	.3935	.3933	.3932	.3931	.3931	.6625	.6662	.6700	.6737	.6775
0.22	.3834	.3832	.3830	.3829	.3828	.6619	.6657	.6696	.6735	.6775
0.23	.3735	.3732	.3729	.3727	.3725	.6611	.6651	.6691	.6731	.6772
0.24	.3637	.3633	.3630	.3627	.3624	.6602	.6643	.6684	.6726	.6768
0.25	+0.3540	+0.3536	+0.3531	+0.3527	+0.3524	-0.6591	-0.6633	-0.6676	-0.6719	-0.6762
0.26	.3445	.3439	.3434	.3429	.3425	.6579	.6622	.6665	.6709	.6754
0.27	.3351	.3344	.3338	.3333	.3327	.6565	.6609	.6654	.6699	.6744
0.28	.3258	.3251	.3244	.3237	.3231	.6549	.6594	.6640	.6686	.6733
0.29	.3167	.3158	.3150	.3143	.3135	.6532	.6579	.6625	.6672	.6720
0.30	+0.3077	+0.3067	+0.3058	+0.3050	+0.3041	-0.6514	-0.6561	-0.6609	-0.6657	-0.6706
0.31	.2988	.2978	.2967	.2958	.2948	.6495	.6543	.6591	.6640	.6690
0.32	.2901	.2889	.2878	.2867	.2857	.6474	.6523	.6572	.6622	.6673
0.33	.2815	.2802	.2790	.2778	.2767	.6452	.6502	.6552	.6602	.6654
0.34	.2730	.2716	.2703	.2690	.2678	.6429	.6479	.6530	.6581	.6634
0.35	+0.2647	+0.2632	+0.2618	+0.2604	+0.2590	-0.6405	-0.6456	-0.6507	-0.6559	-0.6612
0.36	.2565	.2549	.2534	.2518	.2503	.6380	.6431	.6483	.6536	.6589
0.37	.2485	.2468	.2451	.2435	.2418	.6354	.6405	.6458	.6511	.6565
0.38	.2406	.2388	.2370	.2352	.2335	.6326	.6379	.6432	.6486	.6540
0.39	.2328	.2309	.2290	.2271	.2253	.6298	.6351	.6405	.6459	.6514
0.40	+0.2252	+0.2231	+0.2211	+0.2191	+0.2172	-0.6269	-0.6322	-0.6376	-0.6431	-0.6487

ON THE COMPLEX VALUES OF ρ

$\frac{\arg \rho}{ \rho }$	$\Re G(\rho)$					$\Im G(\rho)$				
	20°	21°	22°	23°	24°	20°	21°	22°	23°	24°
0.40	+0.2252	+0.2231	+0.2211	+0.2191	+0.2172	-0.6269	-0.6322	-0.6376	-0.6431	-0.6487
.41	.2177	.2155	.2134	.2113	.2092	.6239	.6293	.6347	.6402	.6458
.42	.2103	.2081	.2058	.2036	.2014	.6209	.6263	.6317	.6373	.6429
.43	.2031	.2007	.1984	.1960	.1937	.6177	.6231	.6286	.6342	.6399
.44	.1960	.1935	.1911	.1886	.1862	.6145	.6199	.6254	.6310	.6367
0.45	+0.1891	+0.1865	+0.1839	+0.1813	+0.1788	-0.6112	-0.6167	-0.6222	-0.6278	-0.6335
.46	.1823	.1796	.1769	.1742	.1715	.6079	.6133	.6189	.6245	.6302
.47	.1756	.1728	.1700	.1672	.1644	.6045	.6099	.6155	.6211	.6269
.48	.1691	.1661	.1632	.1603	.1574	.6010	.6065	.6120	.6177	.6234
.49	.1627	.1596	.1566	.1536	.1505	.5975	.6030	.6085	.6142	.6199
0.50	+0.1564	+0.1532	+0.1501	+0.1470	+0.1438	-0.5939	-0.5994	-0.6049	-0.6106	-0.6163
.51	.1502	.1470	.1437	.1405	.1372	.5903	.5958	.6013	.6070	.6127
.52	.1442	.1409	.1375	.1342	.1308	.5866	.5921	.5976	.6033	.6090
.53	.1383	.1349	.1314	.1280	.1245	.5829	.5884	.5939	.5995	.6053
.54	.1326	.1290	.1255	.1219	.1183	.5792	.5846	.5901	.5957	.6015
0.55	+0.1269	+0.1233	+0.1196	+0.1159	+0.1122	-0.5754	-0.5808	-0.5863	-0.5919	-0.5976
.56	.1214	.1177	.1139	.1101	.1063	.5716	.5770	.5825	.5880	.5937
.57	.1161	.1122	.1083	.1045	.1005	.5678	.5732	.5786	.5841	.5898
.58	.1108	.1069	.1029	.9989	.9949	.5640	.5693	.5747	.5802	.5858
.59	.1056	.1016	.9976	.9935	.9894	.5601	.5654	.5707	.5762	.5818
0.60	+0.1006	+0.0965	+0.0924	+0.0882	+0.0840	-0.5562	-0.5614	-0.5668	-0.5722	-0.5778
.61	.9957	.9915	.9873	.9830	.9787	.5523	.5575	.5628	.5682	.5737
.62	.9909	.9866	.9823	.9779	.9735	.5483	.5535	.5588	.5641	.5696
.63	.9862	.9819	.9775	.9730	.9685	.5444	.5495	.5547	.5601	.5655
.64	.9817	.9772	.9727	.9682	.9636	.5405	.5455	.5507	.5560	.5613
0.65	+0.0772	+0.0727	+0.0681	+0.0635	+0.0588	-0.5365	-0.5415	-0.5466	-0.5519	-0.5572
.66	.9729	.9683	.9636	.9589	.9541	.5325	.5375	.5426	.5478	.5530
.67	.9686	.9640	.9592	.9544	.9496	.5286	.5335	.5385	.5436	.5488
.68	.9645	.9598	.9550	.9501	.9451	.5246	.5295	.5344	.5395	.5446
.69	.9605	.9557	.9508	.9458	.9408	.5206	.5254	.5304	.5354	.5404
0.70	+0.0566	+0.0517	+0.0467	+0.0417	+0.0366	-0.5166	-0.5214	-0.5263	-0.5312	-0.5362
.71	.9527	.9478	.9428	.9377	.9325	.5127	.5174	.5222	.5271	.5320
.72	.9490	.9440	.9389	.9337	.9285	.5087	.5134	.5181	.5229	.5278
.73	.9454	.9403	.9352	.9299	.9246	.5048	.5094	.5140	.5188	.5236
.74	.9419	.9367	.9315	.9262	.9208	.5008	.5053	.5100	.5147	.5194
0.75	+0.0384	+0.0332	+0.0280	+0.0226	+0.0172	-0.4969	-0.5013	-0.5059	-0.5105	-0.5152
.76	.9351	.9298	.9245	.9191	.9136	.4929	.4974	.5018	.5064	.5110
.77	.9318	.9265	.9211	.9157	.9101	.4890	.4934	.4978	.5023	.5069
.78	.9287	.9233	.9179	.9124	.9067	.4851	.4894	.4938	.4982	.5027
.79	.9256	.9202	.9147	.9091	.9034	.4812	.4855	.4898	.4941	.4985
0.80	+0.0226	+0.0171	+0.0116	+0.0060	+0.0003	-0.4774	-0.4815	-0.4858	-0.4900	-0.4944

$\mathcal{I}G(\rho)$

$\mathcal{R}G(\rho)$

$\arg \rho$ $ \rho $	25°	26°	27°	28°	29°	25°	26°	27°	28°	29°
0.00	+0.6267	+0.6267	+0.6267	+0.6267	+0.6267	-0.6267	-0.6267	-0.6267	-0.6267	-0.6267
0.01	.6153	.6154	.6155	.6156	.6157	.6318	.6320	.6322	.6324	.6326
0.02	.6039	.6041	.6042	.6044	.6046	.6367	.6371	.6375	.6379	.6383
0.03	.5925	.5927	.5930	.5933	.5935	.6413	.6419	.6425	.6431	.6437
0.04	.5811	.5814	.5817	.5821	.5824	.6457	.6464	.6472	.6480	.6488
0.05	+0.5697	+0.5701	+0.5704	+0.5708	+0.5712	-0.6497	-0.6507	-0.6517	-0.6527	-0.6537
0.06	.5583	.5587	.5591	.5596	.5600	.6535	.6547	.6559	.6571	.6583
0.07	.5470	.5474	.5479	.5483	.5488	.6571	.6585	.6598	.6612	.6626
0.08	.5356	.5361	.5366	.5371	.5376	.6604	.6619	.6635	.6651	.6667
0.09	.5243	.5248	.5253	.5258	.5264	.6634	.6652	.6669	.6687	.6705
0.10	+0.5131	+0.5135	+0.5141	+0.5146	+0.5152	-0.6662	-0.6681	-0.6701	-0.6721	-0.6740
0.11	.5018	.5023	.5028	.5034	.5040	.6687	.6709	.6730	.6752	.6773
0.12	.4907	.4911	.4916	.4922	.4928	.6710	.6733	.6757	.6780	.6804
0.13	.4795	.4800	.4805	.4810	.4816	.6731	.6756	.6781	.6806	.6832
0.14	.4685	.4689	.4694	.4699	.4705	.6749	.6776	.6803	.6830	.6857
0.15	+0.4575	+0.4579	+0.4583	+0.4588	+0.4594	-0.6765	-0.6793	-0.6822	-0.6851	-0.6880
0.16	.4466	.4469	.4473	.4478	.4483	.6778	.6809	.6839	.6870	.6901
0.17	.4357	.4360	.4364	.4368	.4373	.6789	.6822	.6854	.6886	.6919
0.18	.4249	.4252	.4255	.4259	.4264	.6799	.6832	.6866	.6900	.6935
0.19	.4142	.4145	.4147	.4151	.4155	.6806	.6841	.6877	.6912	.6948
0.20	+0.4037	+0.4038	+0.4040	+0.4043	+0.4046	-0.6811	-0.6848	-0.6885	-0.6922	-0.6960
0.21	.3931	.3932	.3934	.3936	.3939	.6813	.6852	.6891	.6929	.6969
0.22	.3827	.3828	.3828	.3830	.3832	.6814	.6854	.6894	.6935	.6976
0.23	.3724	.3724	.3724	.3724	.3726	.6813	.6855	.6896	.6938	.6980
0.24	.3622	.3621	.3620	.3620	.3620	.6810	.6853	.6896	.6939	.6983
0.25	+0.3521	+0.3519	+0.3517	+0.3516	+0.3516	-0.6805	-0.6849	-0.6894	-0.6938	-0.6984
0.26	.3421	.3418	.3416	.3414	.3412	.6799	.6844	.6890	.6936	.6982
0.27	.3323	.3319	.3315	.3312	.3310	.6790	.6837	.6884	.6931	.6979
0.28	.3225	.3220	.3216	.3212	.3208	.6780	.6828	.6876	.6924	.6974
0.29	.3129	.3123	.3117	.3112	.3108	.6768	.6817	.6866	.6916	.6966
0.30	+0.3034	+0.3026	+0.3020	+0.3014	+0.3008	-0.6755	-0.6805	-0.6855	-0.6906	-0.6958
0.31	.2940	.2931	.2924	.2917	.2910	.6740	.6791	.6842	.6894	.6947
0.32	.2847	.2838	.2829	.2820	.2813	.6724	.6775	.6828	.6881	.6934
0.33	.2756	.2745	.2735	.2726	.2717	.6706	.6758	.6812	.6865	.6920
0.34	.2665	.2654	.2643	.2632	.2622	.6686	.6740	.6794	.6849	.6904
0.35	+0.2577	+0.2564	+0.2551	+0.2539	+0.2528	-0.6666	-0.6720	-0.6775	-0.6830	-0.6887
0.36	.2489	.2475	.2461	.2448	.2436	.6644	.6698	.6754	.6811	.6868
0.37	.2403	.2388	.2373	.2358	.2344	.6620	.6676	.6732	.6789	.6848
0.38	.2318	.2301	.2285	.2270	.2255	.6596	.6652	.6709	.6767	.6826
0.39	.2234	.2217	.2199	.2182	.2166	.6570	.6627	.6684	.6743	.6802
0.40	+0.2152	+0.2133	+0.2115	+0.2096	+0.2079	-0.6543	-0.6600	-0.6659	-0.6718	-0.6778

ON THE COMPLEX VALUES OF ρ

$\frac{\arg \rho}{ \rho }$	$\Re G(\rho)$					$\Im G(\rho)$				
	25°	26°	27°	28°	29°	25°	26°	27°	28°	29°
0.40	+0.2152	+0.2133	+0.2115	+0.2096	+0.2079	-0.6543	-0.6600	-0.6659	-0.6718	-0.6778
.41	.2072	.2051	.2031	.2012	.1993	.6515	.6573	.6632	.6691	.6752
.42	.1992	.1971	.1949	.1928	.1908	.6486	.6544	.6603	.6664	.6725
.43	.1914	.1891	.1869	.1847	.1825	.6456	.6515	.6574	.6635	.6696
.44	.1837	.1813	.1790	.1766	.1743	.6425	.6484	.6544	.6605	.6667
0.45	+0.1762	+0.1737	+0.1712	+0.1687	+0.1662	-0.6393	-0.6452	-0.6513	-0.6574	-0.6636
.46	.1688	.1662	.1635	.1609	.1583	.6361	.6420	.6480	.6542	.6604
.47	.1616	.1588	.1560	.1533	.1505	.6327	.6387	.6447	.6509	.6571
.48	.1545	.1516	.1487	.1458	.1429	.6293	.6352	.6413	.6475	.6537
.49	.1475	.1445	.1414	.1384	.1354	.6258	.6317	.6378	.6440	.6503
0.50	+0.1407	+0.1375	+0.1344	+0.1312	+0.1281	-0.6222	-0.6282	-0.6342	-0.6404	-0.6467
.51	.1340	.1307	.1274	.1241	.1208	.6186	.6245	.6306	.6368	.6431
.52	.1274	.1240	.1206	.1172	.1138	.6149	.6208	.6269	.6330	.6393
.53	.1210	.1174	.1139	.1104	.1068	.6111	.6170	.6231	.6292	.6355
.54	.1147	.1110	.1074	.1037	.1000	.6073	.6132	.6192	.6254	.6317
0.55	+0.1085	+0.1048	+0.1010	+0.0972	+0.0934	-0.6034	-0.6093	-0.6153	-0.6215	-0.6277
.56	.1025	.0986	.0947	.0908	.0869	.5995	.6054	.6114	.6175	.6237
.57	.0966	.0926	.0886	.0846	.0805	.5955	.6014	.6073	.6134	.6196
.58	.0908	.0867	.0826	.0785	.0743	.5915	.5973	.6033	.6093	.6155
.59	.0852	.0810	.0768	.0725	.0682	.5875	.5933	.5992	.6052	.6113
0.60	+0.0797	+0.0754	+0.0710	+0.0666	+0.0622	-0.5834	-0.5891	-0.5950	-0.6010	-0.6071
.61	.0743	.0699	.0654	.0609	.0564	.5793	.5850	.5908	.5968	.6028
.62	.0691	.0645	.0600	.0554	.0507	.5751	.5808	.5866	.5925	.5985
.63	.0639	.0593	.0546	.0499	.0451	.5710	.5766	.5823	.5882	.5942
.64	.0589	.0542	.0494	.0446	.0397	.5668	.5724	.5781	.5839	.5898
0.65	+0.0540	+0.0492	+0.0444	+0.0394	+0.0344	-0.5626	-0.5681	-0.5737	-0.5795	-0.5854
.66	.0493	.0444	.0394	.0344	.0293	.5584	.5638	.5694	.5751	.5809
.67	.0446	.0396	.0346	.0295	.0242	.5541	.5596	.5651	.5707	.5764
.68	.0401	.0350	.0299	.0246	.0193	.5499	.5552	.5607	.5663	.5720
.69	.0357	.0305	.0253	.0200	.0146	.5456	.5509	.5563	.5618	.5674
0.70	+0.0314	+0.0262	+0.0208	+0.0154	+0.0099	-0.5414	-0.5466	-0.5519	-0.5574	-0.5629
.71	.0272	.0219	.0165	.0110	.0054	.5371	.5423	.5475	.5529	.5584
.72	.0232	.0178	.0123	.0067	.0010	.5328	.5379	.5431	.5484	.5538
.73	.0192	.0137	.0082	+0.0025	-0.0033	.5286	.5336	.5387	.5439	.5493
.74	.0154	.0098	.0042	-0.0016	.0075	.5243	.5292	.5343	.5394	.5447
0.75	+0.0116	+0.0060	+0.0003	-0.0056	-0.0115	-0.5200	-0.5249	-0.5299	-0.5349	-0.5401
.76	.0080	+0.0023	-0.0035	.0094	.0154	.5158	.5206	.5255	.5304	.5355
.77	.0044	-0.0013	.0072	.0132	.0192	.5115	.5162	.5210	.5260	.5310
.78	+0.0010	.0048	.0108	.0168	.0230	.5073	.5119	.5166	.5215	.5264
.79	-0.0023	.0082	.0142	.0203	.0265	.5030	.5076	.5123	.5170	.5218
0.80	-0.0056	-0.0115	-0.0176	-0.0237	-0.0300	-0.4988	-0.5033	-0.5079	-0.5125	-0.5173

$\mathcal{J}G(\rho)$

$\mathcal{R}G(\rho)$

$\frac{\arg \rho}{ \rho }$	30°	31°	32°	33°	34°	30°	31°	32°	33°	34°
0.00	+0.6267	+0.6267	+0.6267	+0.6267	+0.6267	-0.6267	-0.6267	-0.6267	-0.6267	-0.6267
0.01	.6158	.6159	.6160	.6161	.6162	.6328	.6330	.6332	.6334	.6335
0.02	.6048	.6050	.6052	.6054	.6057	.6387	.6390	.6394	.6398	.6402
0.03	.5938	.5941	.5944	.5947	.5950	.6442	.6448	.6454	.6460	.6465
0.04	.5828	.5831	.5835	.5839	.5843	.6496	.6503	.6511	.6519	.6526
0.05	+0.5717	+0.5721	+0.5725	+0.5730	+0.5735	-0.6546	-0.6556	-0.6566	-0.6575	-0.6585
0.06	.5605	.5610	.5615	.5621	.5626	.6594	.6606	.6618	.6629	.6641
0.07	.5494	.5499	.5505	.5511	.5517	.6640	.6653	.6667	.6680	.6694
0.08	.5382	.5388	.5394	.5400	.5407	.6682	.6698	.6713	.6729	.6744
0.09	.5270	.5276	.5283	.5290	.5297	.6722	.6740	.6757	.6775	.6792
0.10	+0.5158	+0.5164	+0.5171	+0.5178	+0.5186	-0.6760	-0.6779	-0.6799	-0.6818	-0.6838
0.11	.5046	.5053	.5060	.5067	.5075	.6795	.6816	.6838	.6859	.6880
0.12	.4934	.4941	.4948	.4955	.4963	.6827	.6850	.6874	.6897	.6921
0.13	.4822	.4829	.4836	.4844	.4852	.6857	.6882	.6907	.6933	.6958
0.14	.4711	.4718	.4725	.4732	.4740	.6884	.6911	.6939	.6966	.6993
0.15	+0.4600	+0.4606	+0.4613	+0.4621	+0.4628	-0.6909	-0.6938	-0.6967	-0.6996	-0.7026
0.16	.4489	.4495	.4502	.4509	.4517	.6931	.6962	.6993	.7024	.7056
0.17	.4378	.4384	.4391	.4398	.4405	.6951	.6984	.7017	.7050	.7083
0.18	.4268	.4274	.4280	.4286	.4294	.6969	.7004	.7038	.7073	.7108
0.19	.4159	.4164	.4170	.4176	.4182	.6984	.7021	.7057	.7094	.7130
0.20	+0.4050	+0.4055	+0.4060	+0.4065	+0.4072	-0.6997	-0.7035	-0.7074	-0.7112	-0.7151
0.21	.3942	.3946	.3950	.3955	.3961	.7008	.7048	.7088	.7128	.7168
0.22	.3834	.3837	.3841	.3846	.3851	.7017	.7058	.7100	.7141	.7183
0.23	.3727	.3730	.3733	.3737	.3741	.7023	.7066	.7109	.7153	.7196
0.24	.3621	.3623	.3625	.3628	.3632	.7027	.7072	.7116	.7162	.7207
0.25	+0.3516	+0.3517	+0.3518	+0.3520	+0.3523	-0.7029	-0.7075	-0.7121	-0.7168	-0.7215
0.26	.3412	.3411	.3412	.3413	.3415	.7029	.7077	.7124	.7173	.7221
0.27	.3308	.3307	.3307	.3307	.3308	.7027	.7076	.7125	.7175	.7225
0.28	.3206	.3203	.3202	.3201	.3201	.7023	.7073	.7124	.7175	.7227
0.29	.3104	.3101	.3098	.3097	.3095	.7017	.7069	.7121	.7173	.7226
0.30	+0.3003	+0.2999	+0.2996	+0.2993	+0.2990	-0.7010	-0.7062	-0.7116	-0.7169	-0.7224
0.31	.2904	.2898	.2894	.2890	.2886	.7000	.7054	.7108	.7163	.7219
0.32	.2806	.2799	.2793	.2788	.2783	.6989	.7044	.7099	.7156	.7213
0.33	.2708	.2700	.2693	.2687	.2681	.6975	.7032	.7088	.7146	.7204
0.34	.2612	.2603	.2595	.2587	.2580	.6961	.7018	.7075	.7134	.7193
0.35	+0.2517	+0.2507	+0.2497	+0.2488	+0.2480	-0.6944	-0.7002	-0.7061	-0.7121	-0.7181
0.36	.2423	.2412	.2401	.2390	.2381	.6926	.6985	.7045	.7105	.7167
0.37	.2331	.2318	.2306	.2294	.2283	.6906	.6966	.7027	.7088	.7151
0.38	.2240	.2225	.2212	.2198	.2186	.6885	.6946	.7007	.7070	.7133
0.39	.2150	.2134	.2119	.2104	.2090	.6863	.6924	.6986	.7049	.7113
0.40	+0.2061	+0.2044	+0.2028	+0.2011	+0.1996	-0.6839	-0.6901	-0.6963	-0.7027	-0.7092

ON THE COMPLEX VALUES OF ρ

$\frac{\arg \rho}{ \rho }$	$\Re G(\rho)$				$\Im G(\rho)$					
	30°	31°	32°	33°	34°	30°	31°	32°	33°	34°
0.40	+0.2061	+0.2044	+0.2028	+0.2011	+0.1996	-0.6839	-0.6901	-0.6963	-0.7027	-0.7092
.41	.1974	.1955	.1937	.1920	.1903	.6813	.6876	.6939	.7004	.7070
.42	.1888	.1868	.1848	.1829	.1811	.6787	.6850	.6914	.6979	.7045
.43	.1803	.1782	.1761	.1740	.1720	.6759	.6822	.6887	.6953	.7019
.44	.1720	.1697	.1675	.1653	.1631	.6729	.6793	.6858	.6925	.6992
0.45	+0.1638	+0.1614	+0.1590	+0.1566	+0.1543	-0.6699	-0.6763	-0.6829	-0.6896	-0.6964
.46	.1557	.1532	.1506	.1481	.1457	.6668	.6732	.6798	.6865	.6934
.47	.1478	.1451	.1424	.1398	.1371	.6635	.6700	.6766	.6833	.6902
.48	.1400	.1372	.1344	.1315	.1288	.6601	.6667	.6733	.6801	.6870
.49	.1324	.1294	.1264	.1235	.1205	.6567	.6632	.6699	.6766	.6836
0.50	+0.1249	+0.1218	+0.1186	+0.1155	+0.1124	-0.6531	-0.6597	-0.6663	-0.6731	-0.6801
.51	.1176	.1143	.1110	.1077	.1045	.6495	.6560	.6627	.6695	.6765
.52	.1103	.1069	.1035	.1001	.0967	.6458	.6523	.6590	.6658	.6727
.53	.1033	.0997	.0961	.0926	.0890	.6419	.6485	.6552	.6620	.6689
.54	.0963	.0926	.0889	.0852	.0815	.6381	.6446	.6512	.6580	.6650
0.55	+0.0896	+0.0857	+0.0819	+0.0780	+0.0741	-0.6341	-0.6406	-0.6473	-0.6540	-0.6610
.56	.0829	.0789	.0749	.0709	.0669	.6301	.6366	.6432	.6500	.6569
.57	.0764	.0723	.0682	.0640	.0598	.6260	.6324	.6390	.6458	.6527
.58	.0700	.0658	.0615	.0572	.0529	.6218	.6283	.6348	.6415	.6484
.59	.0638	.0594	.0550	.0506	.0461	.6176	.6240	.6305	.6372	.6441
0.60	+0.0577	+0.0532	+0.0487	+0.0441	+0.0394	-0.6133	-0.6197	-0.6262	-0.6329	-0.6397
.61	.0518	.0472	.0425	.0377	.0329	.6090	.6154	.6218	.6284	.6352
.62	.0460	.0412	.0364	.0315	.0266	.6047	.6109	.6174	.6239	.6306
.63	.0403	.0354	.0305	.0255	.0204	.6003	.6065	.6129	.6194	.6260
.64	.0348	.0298	.0247	.0196	.0144	.5958	.6020	.6083	.6148	.6214
0.65	+0.0294	+0.0242	+0.0190	+0.0138	+0.0085	-0.5914	-0.5975	-0.6037	-0.6101	-0.6167
.66	.0241	.0189	.0135	.0082	.0027	.5868	.5929	.5991	.6054	.6119
.67	.0190	.0136	.0082	+0.0027	-0.0029	.5823	.5883	.5944	.6007	.6071
.68	.0140	.0085	+0.0029	-0.0027	-0.0084	.5778	.5837	.5897	.5959	.6023
.69	.0091	+0.0035	-0.0021	.0079	.0137	.5732	.5790	.5850	.5911	.5974
0.70	+0.0043	-0.0013	-0.0071	-0.0130	-0.0189	-0.5686	-0.5744	-0.5803	-0.5863	-0.5925
.71	-0.0003	.0061	.0119	.0179	.0240	.5640	.5697	.5755	.5815	.5876
.72	.0048	.0107	.0166	.0227	.0289	.5593	.5650	.5707	.5766	.5826
.73	.0092	.0151	.0212	.0274	.0337	.5547	.5602	.5659	.5717	.5776
.74	.0134	.0195	.0256	.0319	.0383	.5500	.5555	.5611	.5668	.5727
0.75	-0.0175	-0.0237	-0.0299	-0.0363	-0.0428	-0.5454	-0.5508	-0.5563	-0.5619	-0.5676
.76	.0216	.0278	.0341	.0406	.0472	.5407	.5460	.5514	.5570	.5626
.77	.0254	.0318	.0382	.0448	.0515	.5361	.5413	.5466	.5520	.5576
.78	.0292	.0356	.0421	.0488	.0556	.5314	.5365	.5418	.5471	.5526
.79	.0329	.0394	.0460	.0527	.0596	.5268	.5318	.5369	.5422	.5475
0.80	-0.0364	-0.0430	-0.0497	-0.0565	-0.0634	-0.5221	-0.5271	-0.5321	-0.5372	-0.5425

$\frac{\arg \rho}{ \rho }$	$\Re G(\rho)$				$\Im G(\rho)$					
	35°	36°	37°	38°	39°	35°	36°	37°	38°	39°
0.00	+0.6267	+0.6267	+0.6267	+0.6267	+0.6267	-0.6267	-0.6267	-0.6267	-0.6267	-0.6267
0.01	.6163	.6165	.6166	.6167	.6168	.6337	.6339	.6341	.6343	.6344
0.02	.6059	.6061	.6064	.6066	.6069	.6405	.6409	.6413	.6416	.6420
0.03	.5954	.5957	.5961	.5964	.5968	.6471	.6476	.6482	.6487	.6493
0.04	.5847	.5852	.5856	.5861	.5866	.6534	.6541	.6549	.6556	.6563
0.05	+0.5740	+0.5745	+0.5751	+0.5756	+0.5762	-0.66594	-0.66603	-0.66613	-0.66622	-0.66631
0.06	.5632	.5638	.5644	.5651	.5657	.6652	.6663	.6674	.6686	.6697
0.07	.5523	.5530	.5537	.5544	.5552	.6707	.6720	.6734	.6747	.6760
0.08	.5414	.5421	.5429	.5437	.5445	.6760	.6775	.6790	.6805	.6820
0.09	.5304	.5312	.5320	.5329	.5337	.6810	.6827	.6844	.6861	.6878
0.10	+0.5194	+0.5202	+0.5211	+0.5220	+0.5229	-0.6857	-0.6876	-0.6896	-0.6915	-0.6934
0.11	.5083	.5091	.5100	.5110	.5119	.6902	.6923	.6944	.6965	.6986
0.12	.4972	.4981	.4990	.4999	.5009	.6944	.6967	.6990	.7014	.7037
0.13	.4860	.4869	.4879	.4888	.4899	.6983	.7009	.7034	.7059	.7084
0.14	.4749	.4758	.4767	.4777	.4788	.7020	.7048	.7075	.7102	.7130
0.15	+0.4637	+0.4646	+0.4655	+0.4665	+0.4676	-0.7055	-0.7084	-0.7114	-0.7143	-0.7172
0.16	.4525	.4534	.4543	.4553	.4564	.7087	.7118	.7149	.7181	.7212
0.17	.4413	.4422	.4431	.4441	.4451	.7116	.7149	.7183	.7216	.7249
0.18	.4301	.4310	.4319	.4328	.4339	.7143	.7178	.7213	.7249	.7284
0.19	.4190	.4198	.4206	.4216	.4226	.7167	.7205	.7242	.7279	.7316
0.20	+0.4078	+0.4086	+0.4094	+0.4103	+0.4113	-0.7189	-0.7228	-0.7267	-0.7307	-0.7346
0.21	.3967	.3974	.3982	.3990	.4000	.7209	.7250	.7291	.7332	.7373
0.22	.3856	.3863	.3870	.3878	.3886	.7226	.7268	.7311	.7354	.7398
0.23	.3746	.3752	.3758	.3765	.3773	.7240	.7285	.7330	.7374	.7420
0.24	.3636	.3641	.3647	.3653	.3661	.7253	.7299	.7345	.7392	.7439
0.25	+0.3527	+0.3531	+0.3536	+0.3541	+0.3548	-0.7263	-0.7311	-0.7359	-0.7407	-0.7456
0.26	.3418	.3421	.3425	.3430	.3436	.7270	.7320	.7370	.7420	.7471
0.27	.3309	.3312	.3315	.3319	.3324	.7276	.7327	.7378	.7430	.7483
0.28	.3202	.3203	.3205	.3208	.3212	.7279	.7332	.7385	.7439	.7493
0.29	.3095	.3095	.3096	.3098	.3101	.7280	.7334	.7389	.7444	.7500
0.30	+0.2989	+0.2988	+0.2988	+0.2989	+0.2990	-0.7279	-0.7335	-0.7391	-0.7448	-0.7505
0.31	.2884	.2882	.2880	.2880	.2880	.7276	.7333	.7390	.7449	.7508
0.32	.2779	.2776	.2774	.2772	.2771	.7270	.7329	.7388	.7448	.7508
0.33	.2676	.2671	.2668	.2665	.2663	.7263	.7323	.7383	.7444	.7506
0.34	.2573	.2568	.2562	.2558	.2555	.7254	.7315	.7376	.7439	.7502
0.35	+0.2472	+0.2465	+0.2458	+0.2453	+0.2448	-0.7242	-0.7304	-0.7367	-0.7431	-0.7496
0.36	.2371	.2363	.2355	.2348	.2342	.7229	.7292	.7356	.7421	.7487
0.37	.2272	.2262	.2253	.2244	.2236	.7214	.7278	.7344	.7410	.7477
0.38	.2174	.2162	.2152	.2141	.2132	.7197	.7263	.7329	.7396	.7464
0.39	.2077	.2064	.2051	.2040	.2029	.7179	.7245	.7312	.7380	.7450
0.40	+0.1981	+0.1966	+0.1952	+0.1939	+0.1927	-0.7158	-0.7225	-0.7294	-0.7363	-0.7433

ON THE COMPLEX VALUES OF ρ

$\Im G(\rho)$

$\Re G(\rho)$

$\arg \rho$ $ \rho $	35°	36°	37°	38°	39°	35°	36°	37°	38°	39°
0.40	+0.1981	+0.1966	+0.1952	+0.1939	+0.1927	-0.7158	-0.7225	-0.7294	-0.7363	-0.7433
41	.1886	.1870	.1855	.1840	.1825	.7136	.7204	.7273	.7343	.7415
42	.1793	.1775	.1758	.1741	.1726	.7113	.7181	.7251	.7322	.7394
43	.1701	.1681	.1663	.1644	.1627	.7088	.7157	.7227	.7299	.7372
44	.1610	.1589	.1568	.1549	.1529	.7061	.7131	.7202	.7274	.7348
0.45	+0.1520	+0.1498	+0.1476	+0.1454	+0.1433	-0.7033	-0.7103	-0.7175	-0.7248	-0.7322
46	.1432	.1408	.1384	.1361	.1338	.7003	.7074	.7146	.7220	.7295
47	.1345	.1319	.1294	.1269	.1244	.6972	.7043	.7116	.7190	.7266
48	.1260	.1232	.1205	.1178	.1152	.6940	.7011	.7085	.7159	.7235
49	.1176	.1147	.1118	.1089	.1061	.6906	.6978	.7052	.7127	.7203
0.50	+0.1093	+0.1062	+0.1032	+0.1001	+0.0971	-0.6871	-0.6944	-0.7017	-0.7093	-0.7169
51	.1012	.0980	.0947	.0915	.0883	.6835	.6908	.6982	.7057	.7134
52	.0932	.0898	.0864	.0830	.0796	.6798	.6871	.6945	.7020	.7098
53	.0854	.0818	.0782	.0747	.0711	.6760	.6833	.6907	.6982	.7060
54	.0777	.0740	.0702	.0665	.0627	.6721	.6793	.6867	.6943	.7020
0.55	+0.0702	+0.0663	+0.0623	+0.0584	+0.0545	-0.6681	-0.6753	-0.6827	-0.6903	-0.6980
56	.0628	.0587	.0546	.0505	.0464	.6639	.6712	.6786	.6861	.6938
57	.0556	.0513	.0471	.0428	.0385	.6597	.6669	.6743	.6818	.6896
58	.0485	.0441	.0396	.0352	.0307	.6554	.6626	.6700	.6775	.6852
59	.0415	.0370	.0324	.0278	.0231	.6511	.6582	.6655	.6730	.6807
0.60	+0.0348	+0.0300	+0.0253	+0.0205	+0.0156	-0.6466	-0.6537	-0.6610	-0.6685	-0.6761
61	.0281	.0232	.0183	.0133	.0083	.6421	.6492	.6564	.6638	.6714
62	.0216	.0166	.0115	+0.0064	+0.0012	.6375	.6445	.6517	.6591	.6666
63	.0153	.0101	+0.0049	-0.0004	-0.0058	.6328	.6398	.6470	.6543	.6618
64	.0091	+0.0038	-0.0016	.0071	.0126	.6281	.6350	.6421	.6494	.6568
0.65	+0.0030	-0.0024	-0.0080	-0.0136	-0.0193	-0.6234	-0.6302	-0.6372	-0.6444	-0.6518
66	.0029	.0085	.0142	.0199	.0258	.6185	.6253	.6323	.6394	.6467
67	.0086	.0144	.0202	.0261	.0321	.6137	.6204	.6273	.6343	.6416
68	.0142	.0201	.0261	.0322	.0383	.6088	.6154	.6222	.6292	.6364
69	.0197	.0257	.0318	.0381	.0444	.6038	.6104	.6171	.6240	.6311
0.70	-0.0250	-0.0311	-0.0374	-0.0438	-0.0502	-0.5988	-0.6053	-0.6120	-0.6188	-0.6258
71	.0302	.0365	.0428	.0494	.0560	.5938	.6002	.6068	.6135	.6204
72	.0352	.0416	.0481	.0548	.0615	.5888	.5951	.6016	.6082	.6150
73	.0401	.0466	.0533	.0600	.0669	.5837	.5899	.5963	.6029	.6096
74	.0448	.0515	.0583	.0652	.0722	.5786	.5848	.5910	.5975	.6041
0.75	-0.0495	-0.0562	-0.0631	-0.0701	-0.0773	-0.5735	-0.5796	-0.5857	-0.5921	-0.5986
76	.0539	.0608	.0678	.0750	.0822	.5684	.5743	.5804	.5866	.5930
77	.0583	.0653	.0724	.0796	.0870	.5633	.5691	.5751	.5812	.5875
78	.0625	.0696	.0768	.0842	.0917	.5581	.5639	.5697	.5757	.5819
79	.0666	.0738	.0811	.0886	.0962	.5530	.5586	.5643	.5702	.5763
0.80	-0.0705	-0.0778	-0.0852	-0.0928	-0.1006	-0.5479	-0.5534	-0.5590	-0.5648	-0.5707

$\mathcal{J}G(\rho)$

$\mathcal{R}G(\rho)$

$\frac{\arg \rho}{ \rho }$	40°	41°	42°	43°	44°	45°	40°	41°	42°	43°	44°	45°
0.00	+0.6267	+0.6267	+0.6267	+0.6267	+0.6267	+0.6267	-0.6267	-0.6267	-0.6267	-0.6267	-0.6267	-0.6267
0.01	.6170	.6171	.6173	.6174	.6176	.6177	.6346	.6348	.6349	.6351	.6353	.6354
0.02	.6071	.6074	.6077	.6080	.6083	.6085	.6423	.6427	.6430	.6433	.6437	.6440
0.03	.5972	.5976	.5980	.5984	.5988	.5992	.6498	.6503	.6508	.6513	.6518	.6523
0.04	.5871	.5876	.5881	.5886	.5891	.5897	.6570	.6577	.6584	.6591	.6598	.6605
0.05	+0.5768	+0.5774	+0.5780	+0.5787	+0.5793	+0.5800	-0.6640	-0.6649	-0.6658	-0.6667	-0.6675	-0.6684
0.06	.5664	.5671	.5679	.5686	.5694	.5701	.6708	.6718	.6729	.6740	.6751	.6761
0.07	.5559	.5567	.5575	.5584	.5592	.5601	.6773	.6785	.6798	.6811	.6823	.6836
0.08	.5453	.5462	.5471	.5480	.5490	.5500	.6835	.6850	.6865	.6879	.6894	.6908
0.09	.5346	.5356	.5365	.5375	.5386	.5396	.6895	.6912	.6929	.6945	.6962	.6978
0.10	+0.5238	+0.5248	+0.5259	+0.5269	+0.5281	+0.5292	-0.6953	-0.6972	-0.6990	-0.7009	-0.7028	-0.7046
0.11	.5130	.5140	.5151	.5162	.5174	.5186	.7008	.7028	.7049	.7070	.7091	.7111
0.12	.5020	.5031	.5042	.5054	.5066	.5079	.7060	.7083	.7106	.7129	.7151	.7174
0.13	.4910	.4921	.4932	.4945	.4957	.4970	.7110	.7135	.7160	.7185	.7210	.7234
0.14	.4799	.4810	.4822	.4834	.4847	.4861	.7157	.7184	.7211	.7238	.7265	.7292
0.15	+0.4687	+0.4698	+0.4711	+0.4723	+0.4737	+0.4750	-0.7201	-0.7231	-0.7260	-0.7289	-0.7318	-0.7347
0.16	.4575	.4586	.4599	.4611	.4625	.4639	.7243	.7275	.7306	.7337	.7369	.7400
0.17	.4462	.4474	.4486	.4499	.4512	.4527	.7283	.7316	.7350	.7383	.7417	.7450
0.18	.4349	.4361	.4373	.4386	.4399	.4413	.7320	.7355	.7391	.7426	.7462	.7498
0.19	.4236	.4247	.4259	.4272	.4285	.4300	.7354	.7392	.7429	.7467	.7505	.7543
0.20	+0.4123	+0.4134	+0.4145	+0.4158	+0.4171	+0.4185	-0.7386	-0.7425	-0.7465	-0.7505	-0.7545	-0.7585
0.21	.4009	.4020	.4031	.4043	.4056	.4070	.7415	.7456	.7498	.7540	.7582	.7625
0.22	.3896	.3906	.3917	.3928	.3941	.3954	.7441	.7485	.7529	.7573	.7617	.7662
0.23	.3782	.3792	.3802	.3813	.3825	.3838	.7465	.7511	.7557	.7603	.7649	.7696
0.24	.3669	.3677	.3687	.3698	.3709	.3721	.7487	.7534	.7582	.7630	.7679	.7728
0.25	+0.3555	+0.3563	+0.3572	+0.3582	+0.3593	+0.3605	-0.7505	-0.7555	-0.7605	-0.7655	-0.7706	-0.7757
0.26	.3442	.3449	.3458	.3467	.3477	.3487	.7522	.7573	.7625	.7677	.7730	.7783
0.27	.3329	.3336	.3343	.3351	.3360	.3370	.7536	.7589	.7643	.7697	.7752	.7807
0.28	.3217	.3222	.3228	.3236	.3244	.3253	.7547	.7603	.7658	.7714	.7771	.7828
0.29	.3104	.3109	.3114	.3120	.3128	.3136	.7556	.7613	.7671	.7729	.7787	.7846
0.30	+0.2993	+0.2996	+0.3000	+0.3006	+0.3012	+0.3019	-0.7563	-0.7622	-0.7681	-0.7741	-0.7801	-0.7862
0.31	.2882	.2884	.2887	.2891	.2896	.2902	.7567	.7628	.7689	.7750	.7813	.7875
0.32	.2771	.2772	.2774	.2777	.2780	.2785	.7569	.7631	.7694	.7757	.7821	.7886
0.33	.2661	.2661	.2661	.2663	.2665	.2669	.7569	.7632	.7697	.7762	.7828	.7894
0.34	.2552	.2550	.2549	.2549	.2550	.2552	.7566	.7631	.7697	.7764	.7831	.7900
0.35	+0.2444	+0.2440	+0.2438	+0.2437	+0.2436	+0.2437	-0.7561	-0.7628	-0.7695	-0.7763	-0.7833	-0.7903
0.36	.2336	.2331	.2327	.2325	.2323	.2322	.7554	.7622	.7691	.7761	.7831	.7903
0.37	.2229	.2223	.2218	.2213	.2210	.2207	.7545	.7614	.7684	.7756	.7828	.7901
0.38	.2123	.2116	.2109	.2102	.2097	.2093	.7534	.7604	.7676	.7748	.7822	.7897
0.39	.2019	.2009	.2000	.1993	.1986	.1980	.7520	.7592	.7665	.7739	.7814	.7890
0.40	+0.1915	+0.1904	+0.1893	+0.1884	+0.1875	+0.1867	-0.7505	-0.7578	-0.7651	-0.7727	-0.7803	-0.7881

ON THE COMPLEX VALUES OF ρ

$\Im G(\rho)$

$\Re G(\rho)$

$\arg \rho$	40°	41°	42°	43°	44°	45°	40°	41°	42°	43°	44°	45°
0.40	+0.1915	+0.1904	+0.1893	+0.1884	+0.1875	+0.1867	-0.7505	-0.7578	-0.7651	-0.7727	-0.7803	-0.7881
.41	.1812	.1799	.1787	.1776	.1765	.1756	.7487	.7561	.7636	.7712	.7790	.7869
.42	.1710	.1696	.1682	.1669	.1656	.1645	.7468	.7543	.7619	.7696	.7775	.7855
.43	.1610	.1593	.1578	.1563	.1548	.1535	.7447	.7522	.7599	.7678	.7758	.7839
.44	.1510	.1492	.1475	.1458	.1442	.1426	.7423	.7500	.7578	.7657	.7738	.7821
0.45	+0.1412	+0.1392	+0.1373	+0.1354	+0.1336	+0.1318	-0.7398	-0.7476	-0.7554	-0.7635	-0.7717	-0.7800
.46	.1315	.1293	.1272	.1251	.1231	.1212	.7372	.7450	.7529	.7610	.7693	.7777
.47	.1220	.1196	.1173	.1150	.1128	.1106	.7343	.7422	.7502	.7584	.7667	.7752
.48	.1125	.1100	.1074	.1050	.1025	.1002	.7313	.7392	.7473	.7555	.7640	.7726
.49	.1033	.1005	.0978	.0951	.0925	.0899	.7281	.7361	.7442	.7525	.7610	.7697
0.50	+0.0941	+0.0912	+0.0882	+0.0853	+0.0825	+0.0797	-0.7248	-0.7328	-0.7410	-0.7493	-0.7579	-0.7666
.51	.0851	.0819	.0788	.0757	.0727	.0696	.7213	.7293	.7375	.7459	.7545	.7633
.52	.0762	.0729	.0696	.0662	.0630	.0597	.7176	.7257	.7340	.7424	.7510	.7599
.53	.0675	.0640	.0604	.0569	.0534	.0500	.7139	.7220	.7302	.7387	.7474	.7562
.54	.0590	.0552	.0515	.0477	.0440	.0404	.7100	.7181	.7263	.7348	.7435	.7524
0.55	+0.0505	+0.0466	+0.0426	+0.0387	+0.0348	+0.0309	-0.7059	-0.7140	-0.7223	-0.7308	-0.7395	-0.7484
.56	.0423	.0381	.0340	.0298	.0257	.0216	.7017	.7098	.7181	.7266	.7353	.7443
.57	.0342	.0298	.0255	.0211	.0168	.0124	.6975	.7055	.7138	.7223	.7310	.7400
.58	.0262	.0217	.0171	.0126	.0080	.0034	.6931	.7011	.7094	.7179	.7266	.7355
.59	.0184	.0137	.0089	+0.0042	-0.0006	-0.0055	.6885	.6966	.7048	.7133	.7220	.7309
0.60	+0.0108	+0.0058	+0.0009	-0.0041	-0.0091	-0.0141	-0.6839	-0.6919	-0.7002	-0.7086	-0.7172	-0.7261
.61	.0033	.0018	.00070	.00018	.00018	.00018	.6792	.6872	.6954	.7037	.7124	.7212
.62	.0040	.0033	.00255	.0017	.0008	.000310	.6744	.6823	.6904	.6988	.7074	.7162
.63	.0112	.0167	.0222	.0278	.0335	.0392	.6695	.6773	.6854	.6937	.7023	.7111
.64	.0182	.0239	.0296	.0354	.0412	.0472	.6645	.6723	.6803	.6886	.6971	.7058
0.65	-0.0250	-0.0309	-0.0368	-0.0428	-0.0489	-0.0550	-0.6594	-0.6672	-0.6751	-0.6833	-0.6917	-0.7004
.66	.0317	.0377	.0439	.0500	.0563	.0626	.6542	.6619	.6698	.6780	.6863	.6949
.67	.0382	.0444	.0507	.0571	.0636	.0701	.6490	.6566	.6645	.6725	.6808	.6893
.68	.0446	.0510	.0574	.0640	.0707	.0774	.6437	.6513	.6590	.6670	.6752	.6836
.69	.0508	.0573	.0640	.0707	.0776	.0845	.6384	.6458	.6535	.6614	.6695	.6778
0.70	-0.0568	-0.0635	-0.0703	-0.0773	-0.0843	-0.0915	-0.6330	-0.6403	-0.6479	-0.6557	-0.6637	-0.6720
.71	.0627	.0696	.0765	.0836	.0909	.0982	.6275	.6348	.6422	.6499	.6578	.6660
.72	.0684	.0754	.0826	.0898	.0973	.1048	.6220	.6292	.6365	.6441	.6519	.6600
.73	.0740	.0811	.0884	.0959	.1035	.1112	.6164	.6235	.6308	.6383	.6459	.6539
.74	.0794	.0867	.0941	.1017	.1095	.1174	.6109	.6178	.6250	.6323	.6399	.6477
0.75	-0.0846	-0.0921	-0.0997	-0.1074	-0.1154	-0.1235	-0.6052	-0.6121	-0.6191	-0.6264	-0.6338	-0.6415
.76	.0897	.0973	.1050	.1130	.1211	.1293	.5996	.6063	.6132	.6203	.6277	.6352
.77	.0946	.1023	.1103	.1183	.1266	.1350	.5939	.6005	.6073	.6143	.6215	.6289
.78	.0994	.1073	.1153	.1235	.1319	.1405	.5882	.5947	.6013	.6082	.6152	.6225
.79	.1040	.1120	.1202	.1285	.1371	.1459	.5825	.5888	.5953	.6021	.6090	.6161
0.80	-0.1085	-0.1166	-0.1249	-0.1334	-0.1421	-0.1510	-0.5767	-0.5829	-0.5893	-0.5959	-0.6027	-0.6097