

UNIVERSITY OF SWAZILAND

FINAL EXAMINATION PAPER 2006

TITLE OF PAPER	: NONPARAMETRIC ANALYSIS
COURSE CODE	: ST 409
TIME ALLOWED	: TWO (2) HOURS
REQUIREMENTS	: CALCULATOR AND STATISTICAL TABLES
INSTRUCTIONS	: ANSWER QUESTION ONE AND ANY OTHER TWO QUESTIONS

Question 1

- a) A researcher for University of Swaziland believes that in recent years female students have been getting taller. She knows that 10 years ago the average height of young adult female students was 1.60 metres. She randomly samples eight young adult female students currently enrolled at UNISWA and measures their heights. The following data are obtained:

1.62 1.68 1.73 1.52 1.57 1.65 1.68 1.60

The distribution of the data is not known. What is your conclusion about this researcher's assumption? Use $\alpha = 0.05$.

(15 Marks)

- b) The following are 15 measurements of the octane rating of unleaded petrol: 97.5, 95.2, 97.3, 96.0, 96.8, 100.3, 97.4, 95.3, 93.2, 99.1, 96.1, 97.6, 98.2, 98.5, and 94.9. Since the probability distribution of the data is not known, use an appropriate test to test whether or not the mean octane rating of the given type of petrol is 98.5. Use $\alpha = 0.05$.

(20 Marks)

Question 2

The following figures report the milligrams of tar and nicotine found in 10 brands of cigarettes.

Cigarette brand	Tar content	Nicotine content
Viceroy	14	0.9
Marlboro	17	1.1
Chesterfield	28	1.6
Kool	17	1.3
Kent	16	1.0
Raleigh	13	0.8
Old Gold	24	1.5
Philip Morris	25	1.4
Oasis	18	1.2
Players	31	2.0

Use an appropriate nonparametric test to measure the degree of relationship between tar and nicotine content in cigarettes. Use $\alpha = 0.05$.

(20 marks)

Question 3

The following data represent the operating times in hours for 3 types of scientific pocket calculators before a recharge is required:

Calculator type		
A	B	C
4.9	5.5	6.4
6.1	5.4	6.8
4.3	6.2	5.6
4.6	5.8	6.5
5.3	5.5	6.3
	5.2	6.6
	4.8	

Use an appropriate nonparametric test, at 1% level of significance, to test the hypothesis that the operating times for all three calculators are equal. (20 marks)

Question 4

Poisoning by DDT causes convulsions in humans and other mammals. One hypothesis proposed in the past was that changes in electrical measurements of nerve activity might be associated with the convulsions. To test this hypothesis, 20 rats were chosen, from which 10 rats were randomly allocated to be given DDT, and 10 rats were used as controls. When a nerve is stimulated, there is sharp spike followed by a second spike. The interest is in the height of the second spike as a percent of the first spike.

Group	Data									
DDT	12.2	16.8	25.0	22.4	8.4	20.5	10.2	12.4	9.1	11.1
Control	11.0	9.6	12.0	9.3	8.1	6.6	15.2	12.6	8.6	14.8

Use an appropriate test to verify whether these two groups come have different distributions. Use $\alpha = 0.05$. (20 marks)

p	0.000	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009
0.25	-0.6745	-0.6713	-0.6682	-0.6651	-0.6620	-0.6588	-0.6557	-0.6526	-0.6495	-0.6464
0.26	-0.6433	-0.6403	-0.6372	-0.6341	-0.6311	-0.6280	-0.6250	-0.6219	-0.6189	-0.6158
0.27	-0.6128	-0.6098	-0.6068	-0.6038	-0.6008	-0.5978	-0.5948	-0.5918	-0.5888	-0.5858
0.28	-0.5828	-0.5799	-0.5769	-0.5740	-0.5710	-0.5681	-0.5651	-0.5622	-0.5592	-0.5563
0.29	-0.5534	-0.5505	-0.5476	-0.5446	-0.5417	-0.5388	-0.5359	-0.5330	-0.5302	-0.5273
0.30	-0.5244	-0.5215	-0.5187	-0.5158	-0.5129	-0.5101	-0.5072	-0.5044	-0.5015	-0.4987
0.31	-0.4959	-0.4930	-0.4902	-0.4874	-0.4845	-0.4817	-0.4789	-0.4761	-0.4733	-0.4705
0.32	-0.4677	-0.4649	-0.4621	-0.4593	-0.4565	-0.4538	-0.4510	-0.4482	-0.4454	-0.4427
0.33	-0.4399	-0.4372	-0.4344	-0.4316	-0.4289	-0.4261	-0.4234	-0.4207	-0.4179	-0.4152
0.34	-0.4125	-0.4097	-0.4070	-0.4043	-0.4016	-0.3989	-0.3961	-0.3934	-0.3907	-0.3880
0.35	-0.3853	-0.3826	-0.3799	-0.3772	-0.3745	-0.3719	-0.3692	-0.3665	-0.3638	-0.3611
0.36	-0.3585	-0.3558	-0.3531	-0.3505	-0.3478	-0.3451	-0.3425	-0.3398	-0.3372	-0.3345
0.37	-0.3319	-0.3292	-0.3266	-0.3239	-0.3213	-0.3186	-0.3160	-0.3134	-0.3107	-0.3081
0.38	-0.3055	-0.3029	-0.3002	-0.2976	-0.2950	-0.2924	-0.2898	-0.2871	-0.2845	-0.2819
0.39	-0.2793	-0.2767	-0.2741	-0.2715	-0.2689	-0.2663	-0.2637	-0.2611	-0.2585	-0.2559
0.40	-0.2533	-0.2508	-0.2482	-0.2456	-0.2430	-0.2404	-0.2378	-0.2353	-0.2327	-0.2301
0.41	-0.2275	-0.2250	-0.2224	-0.2198	-0.2173	-0.2147	-0.2121	-0.2096	-0.2070	-0.2045
0.42	-0.2019	-0.1993	-0.1968	-0.1942	-0.1917	-0.1891	-0.1866	-0.1840	-0.1815	-0.1789
0.43	-0.1764	-0.1738	-0.1713	-0.1687	-0.1662	-0.1637	-0.1611	-0.1586	-0.1560	-0.1535
0.44	-0.1510	-0.1484	-0.1459	-0.1434	-0.1408	-0.1383	-0.1358	-0.1332	-0.1307	-0.1282
0.45	-0.1257	-0.1231	-0.1206	-0.1181	-0.1156	-0.1130	-0.1105	-0.1080	-0.1055	-0.1030
0.46	-0.1004	-0.0979	-0.0954	-0.0929	-0.0904	-0.0878	-0.0853	-0.0828	-0.0803	-0.0778
0.47	-0.0753	-0.0728	-0.0702	-0.0677	-0.0652	-0.0627	-0.0602	-0.0577	-0.0552	-0.0527
0.48	-0.0502	-0.0476	-0.0451	-0.0426	-0.0401	-0.0376	-0.0351	-0.0326	-0.0301	-0.0276
0.49	-0.0251	-0.0226	-0.0201	-0.0175	-0.0150	-0.0125	-0.0100	-0.0075	-0.0050	-0.0025
0.50	0.0000	0.0025	0.0050	0.0075	0.0100	0.0125	0.0150	0.0175	0.0201	0.0226
0.51	0.0251	0.0276	0.0301	0.0326	0.0351	0.0376	0.0401	0.0426	0.0451	0.0476
0.52	0.0502	0.0527	0.0552	0.0577	0.0602	0.0627	0.0652	0.0677	0.0702	0.0728
0.53	0.0753	0.0778	0.0803	0.0828	0.0853	0.0878	0.0904	0.0929	0.0954	0.0979
0.54	0.1004	0.1030	0.1055	0.1080	0.1105	0.1130	0.1156	0.1181	0.1206	0.1231

TABLE A1 (Continued)

p	0.000	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009
0.00	-3.0902	-2.8782	-2.7478	-2.6521	-2.5758	-2.5121	-2.4573	-2.4089	-2.3656	-2.3263
0.01	-2.2904	-2.2571	-2.2262	-2.1973	-2.1701	-2.1444	-2.1201	-2.0969	-2.0749	-2.0537
0.02	-2.0335	-2.0141	-1.9954	-1.9774	-1.9600	-1.9431	-1.9268	-1.9110	-1.8957	-1.8808
0.03	-1.8663	-1.8522	-1.8384	-1.8250	-1.8119	-1.7991	-1.7866	-1.7744	-1.7624	-1.7507
0.04	-1.7392	-1.7279	-1.7169	-1.7060	-1.6954	-1.6849	-1.6747	-1.6646	-1.6546	-1.6449
0.05	-1.6449	-1.6352	-1.6258	-1.6164	-1.6072	-1.5982	-1.5893	-1.5805	-1.5718	-1.5632
0.06	-1.5448	-1.5382	-1.5301	-1.5220	-1.5141	-1.5063	-1.4985	-1.4909	-1.4833	-1.4758
0.07	-1.4758	-1.4684	-1.4611	-1.4538	-1.4466	-1.4395	-1.4325	-1.4255	-1.4187	-1.4118
0.08	-1.4051	-1.3984	-1.3917	-1.3852	-1.3787	-1.3722	-1.3658	-1.3595	-1.3532	-1.3469
0.09	-1.3408	-1.3346	-1.3285	-1.3225	-1.3165	-1.3106	-1.3047	-1.2988	-1.2930	-1.2873
0.10	-1.2816	-1.2759	-1.2702	-1.2646	-1.2591	-1.2536	-1.2481	-1.2426	-1.2372	-1.2319
0.11	-1.2265	-1.2212	-1.2160	-1.2107	-1.2055	-1.2004	-1.1952	-1.1901	-1.1850	-1.1800
0.12	-1.1750	-1.1700	-1.1650	-1.1601	-1.1552	-1.1503	-1.1455	-1.1407	-1.1359	-1.1311
0.13	-1.1264	-1.1217	-1.1170	-1.1123	-1.1077	-1.1031	-1.0985	-1.0939	-1.0893	-1.0848
0.14	-1.0803	-1.0758	-1.0714	-1.0669	-1.0625	-1.0581	-1.0537	-1.0494	-1.0450	-1.0407
0.15	-1.0364	-1.0322	-1.0279	-1.0237	-1.0194	-1.0152	-1.0110	-1.0069	-1.0027	-0.9986
0.16	-0.9945	-0.9904	-0.9863	-0.9822	-0.9782	-0.9741	-0.9701	-0.9661	-0.9621	-0.9581
0.17	-0.9542	-0.9502	-0.9463	-0.9424	-0.9385	-0.9346	-0.9307	-0.9269	-0.9230	-0.9192
0.18	-0.9154	-0.9116	-0.9078	-0.9040	-0.9002	-0.8965	-0.8927	-0.8890	-0.8853	-0.8816
0.19	-0.8779	-0.8742	-0.8705	-0.8669	-0.8633	-0.8596	-0.8560	-0.8524	-0.8488	-0.8452
0.20	-0.8416	-0.8381	-0.8345	-0.8310	-0.8274	-0.8239	-0.8204	-0.8169	-0.8134	-0.8099
0.21	-0.8064	-0.8030	-0.7995	-0.7961	-0.7926	-0.7892	-0.7858	-0.7824	-0.7790	-0.7756
0.22	-0.7722	-0.7688	-0.7655	-0.7621	-0.7588	-0.7554	-0.7521	-0.7488	-0.7454	-0.7421
0.23	-0.7388	-0.7356	-0.7323	-0.7290	-0.7257	-0.7225	-0.7192	-0.7160	-0.7128	-0.7095
0.24	-0.7063	-0.7031	-0.6999	-0.6967	-0.6935	-0.6903	-0.6871	-0.6840	-0.6808	-0.6776

TABLE A1 Normal Distribution

Selected values $Z_{0.001} = -3.7190$ $Z_{0.005} = -3.2905$ $Z_{0.010} = -2.3263$ $Z_{0.025} = -1.9600$ $Z_{0.050} = -1.6449$

Table A1 (Continued)

Source: Generated by R. L. Iman. Used with permission.

*The entries in this table are quantiles z_p of the standard normal random variable Z selected so $P(Z \leq z_p) = p$ and $P(Z > z_p) = 1 - p$. Note that the value of p to two decimal places determines z_p which row to use; the third decimal place of p determines which column to use to find z_p .

p	0.000	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009
0.83	0.9542	0.9581	0.9621	0.9661	0.9701	0.9741	0.9782	0.9822	0.9863	0.9904
0.84	0.9945	0.9986	1.0027	1.0069	1.0110	1.0152	1.0194	1.0237	1.0279	1.0321
0.85	1.0364	1.0407	1.0450	1.0494	1.0537	1.0581	1.0625	1.0669	1.0714	1.0758
0.86	1.0803	1.0848	1.0893	1.0939	1.0985	1.1031	1.1077	1.1123	1.1170	1.1217
0.87	1.1264	1.1311	1.1359	1.1407	1.1455	1.1503	1.1552	1.1601	1.1650	1.1700
0.88	1.1750	1.1800	1.1850	1.1901	1.1952	1.2004	1.2055	1.2107	1.2160	1.2212
0.89	1.2265	1.2319	1.2372	1.2426	1.2481	1.2536	1.2591	1.2646	1.2702	1.2759
0.90	1.2816	1.2873	1.2930	1.2988	1.3047	1.3106	1.3165	1.3225	1.3285	1.3346
0.91	1.3408	1.3469	1.3532	1.3595	1.3658	1.3722	1.3787	1.3852	1.3917	1.3984
0.92	1.4051	1.4118	1.4187	1.4255	1.4325	1.4395	1.4466	1.4538	1.4611	1.4684
0.93	1.4758	1.4833	1.4909	1.4985	1.5063	1.5141	1.5220	1.5301	1.5382	1.5464
0.94	1.5548	1.5632	1.5718	1.5805	1.5893	1.5982	1.6072	1.6164	1.6258	1.6352
0.95	1.6449	1.6546	1.6646	1.6747	1.6849	1.6954	1.7060	1.7169	1.7279	1.7392
0.96	1.7507	1.7624	1.7744	1.7866	1.7991	1.8119	1.8250	1.8384	1.8522	1.8663
0.97	1.8808	1.8957	1.9110	1.9268	1.9431	1.9600	1.9774	1.9954	2.0141	2.0335
0.98	2.0537	2.0749	2.0969	2.1201	2.1444	2.1701	2.1973	2.2262	2.2571	2.2904
0.99	2.3263	2.3656	2.4089	2.4573	2.5121	2.5758	2.6521	2.7478	2.8782	3.0902

Table A1 (Continued)

p	0.000	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009
0.55	0.1282	0.1307	0.1332	0.1358	0.1383	0.1408	0.1434	0.1459	0.1484	0.1509
0.56	0.1510	0.1535	0.1560	0.1586	0.1611	0.1637	0.1662	0.1687	0.1713	0.1738
0.57	0.1764	0.1789	0.1815	0.1840	0.1866	0.1891	0.1917	0.1942	0.1968	0.1993
0.58	0.2019	0.2045	0.2070	0.2096	0.2121	0.2147	0.2173	0.2198	0.2224	0.2250
0.59	0.2275	0.2301	0.2327	0.2353	0.2378	0.2404	0.2430	0.2456	0.2482	0.2508
0.60	0.2533	0.2559	0.2585	0.2611	0.2637	0.2663	0.2689	0.2715	0.2741	0.2767
0.61	0.2793	0.2819	0.2845	0.2871	0.2898	0.2924	0.2950	0.2976	0.3002	0.3029
0.62	0.3055	0.3081	0.3107	0.3134	0.3160	0.3186	0.3213	0.3239	0.3266	0.3292
0.63	0.3319	0.3345	0.3372	0.3398	0.3425	0.3451	0.3478	0.3505	0.3531	0.3558
0.64	0.3585	0.3611	0.3638	0.3665	0.3692	0.3719	0.3745	0.3772	0.3799	0.3826
0.65	0.3853	0.3880	0.3907	0.3934	0.3961	0.3989	0.4016	0.4043	0.4070	0.4097
0.66	0.4125	0.4152	0.4179	0.4207	0.4234	0.4261	0.4289	0.4316	0.4344	0.4372
0.67	0.4399	0.4427	0.4454	0.4482	0.4510	0.4538	0.4565	0.4593	0.4621	0.4649
0.68	0.4677	0.4705	0.4733	0.4761	0.4789	0.4817	0.4845	0.4874	0.4902	0.4930
0.69	0.4959	0.4987	0.5015	0.5044	0.5072	0.5101	0.5129	0.5158	0.5187	0.5215
0.70	0.5244	0.5273	0.5302	0.5330	0.5359	0.5388	0.5417	0.5446	0.5476	0.5505
0.71	0.5534	0.5563	0.5592	0.5622	0.5651	0.5681	0.5710	0.5740	0.5769	0.5799
0.72	0.5828	0.5858	0.5888	0.5918	0.5948	0.5978	0.6008	0.6038	0.6068	0.6098
0.73	0.6128	0.6158	0.6189	0.6219	0.6250	0.6280	0.6311	0.6341	0.6372	0.6403
0.74	0.6433	0.6464	0.6495	0.6526	0.6557	0.6588	0.6620	0.6651	0.6682	0.6713
0.75	0.6745	0.6776	0.6808	0.6840	0.6871	0.6903	0.6935	0.6967	0.6999	0.7031
0.76	0.7063	0.7095	0.7128	0.7160	0.7192	0.7225	0.7257	0.7290	0.7323	0.7356
0.77	0.7388	0.7421	0.7454	0.7488	0.7521	0.7554	0.7588	0.7621	0.7655	0.7688
0.78	0.7722	0.7756	0.7790	0.7824	0.7858	0.7892	0.7926	0.7961	0.7995	0.8030
0.79	0.8064	0.8099	0.8134	0.8169	0.8204	0.8239	0.8274	0.8310	0.8345	0.8381
0.80	0.8416	0.8452	0.8488	0.8524	0.8560	0.8596	0.8633	0.8669	0.8705	0.8742
0.81	0.8779	0.8816	0.8853	0.8890	0.8927	0.8965	0.8985	0.9002	0.9040	0.9078
0.82	0.9154	0.9192	0.9230	0.9269	0.9307	0.9346	0.9385	0.9424	0.9463	0.9502

TABLE A3 (Continued)

n	y	p = 0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95
8	0	0.0039	0.0017	0.0007	0.0002	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
	1	0.0352	0.0181	0.0085	0.0036	0.0013	0.0004	0.0001	0.0000	0.0000	0.0000
	2	0.1445	0.0885	0.0498	0.0253	0.0113	0.0042	0.0012	0.0002	0.0000	0.0000
	3	0.3633	0.2604	0.1737	0.1061	0.0580	0.0273	0.0104	0.0029	0.0004	0.0000
	4	0.6367	0.5230	0.4059	0.2936	0.1941	0.1138	0.0563	0.0214	0.0030	0.0004
	5	0.8555	0.7799	0.6846	0.5722	0.4482	0.3215	0.2031	0.1052	0.0381	0.0058
	6	0.9648	0.9368	0.8936	0.8309	0.7447	0.6329	0.4967	0.3428	0.1869	0.0572
	7	0.9961	0.9916	0.9832	0.9681	0.9424	0.8999	0.8372	0.7275	0.5695	0.3366
9	0	0.0020	0.0008	0.0003	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	1	0.0195	0.0091	0.0038	0.0014	0.0004	0.0001	0.0000	0.0000	0.0000	0.0000
	2	0.0898	0.0498	0.0250	0.0112	0.0043	0.0013	0.0003	0.0000	0.0000	0.0000
	3	0.2539	0.1658	0.0994	0.0536	0.0253	0.0100	0.0031	0.0006	0.0001	0.0000
	4	0.5000	0.3786	0.2666	0.1717	0.0988	0.0489	0.0196	0.0056	0.0009	0.0000
	5	0.7461	0.6386	0.5174	0.3911	0.2703	0.1657	0.0856	0.0339	0.0083	0.0006
	6	0.9102	0.8505	0.7682	0.6627	0.5372	0.3993	0.2618	0.1409	0.0530	0.0084
	7	0.9805	0.9615	0.9295	0.8789	0.8040	0.6997	0.5638	0.4005	0.2252	0.0712
10	0	0.0010	0.0003	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	1	0.0107	0.0045	0.0017	0.0005	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
	2	0.0547	0.0274	0.0123	0.0048	0.0016	0.0004	0.0001	0.0000	0.0000	0.0000
	3	0.1719	0.1020	0.0548	0.0260	0.0106	0.0035	0.0009	0.0001	0.0000	0.0000
	4	0.3770	0.2616	0.1662	0.0949	0.0473	0.0197	0.0064	0.0014	0.0001	0.0000
	5	0.6230	0.4956	0.3669	0.2485	0.1503	0.0781	0.0328	0.0099	0.0016	0.0001
	6	0.8281	0.7340	0.6177	0.4862	0.3504	0.2241	0.1209	0.0500	0.0128	0.0010
	7	0.9453	0.9004	0.8327	0.7384	0.6172	0.4744	0.3222	0.1798	0.0702	0.0115
11	0	0.0005	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	1	0.0059	0.0022	0.0007	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	2	0.0327	0.0148	0.0059	0.0020	0.0006	0.0001	0.0000	0.0000	0.0000	0.0000
	3	0.1133	0.0610	0.0293	0.0122	0.0043	0.0012	0.0002	0.0000	0.0000	0.0000
	4	0.2744	0.1738	0.0994	0.0501	0.0216	0.0076	0.0020	0.0003	0.0000	0.0000
	5	0.5000	0.3669	0.2465	0.1487	0.0782	0.0343	0.0117	0.0027	0.0003	0.0000
	6	0.7256	0.6029	0.4672	0.3317	0.2103	0.1146	0.0504	0.0159	0.0028	0.0001
	7	0.8867	0.8089	0.7037	0.5744	0.4304	0.2867	0.1611	0.0694	0.0185	0.0016
12	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	6	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	7	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
13	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	6	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	7	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
14	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	6	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	7	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

TABLE A3 (Continued)

n	y	p = 0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45
12	0	0.5404	0.2824	0.1422	0.0687	0.0317	0.0138	0.0057	0.0022	0.0008
	1	0.8816	0.6590	0.4435	0.2749	0.1584	0.0850	0.0424	0.0196	0.0083
	2	0.9804	0.8891	0.7358	0.5583	0.3907	0.2528	0.1513	0.0834	0.0421
	3	0.9978	0.9744	0.9078	0.7946	0.6488	0.4925	0.3467	0.2253	0.1345
	4	0.9998	0.9957	0.9761	0.9274	0.8424	0.7237	0.5833	0.4382	0.3044
	5	1.0000	0.9995	0.9954	0.9806	0.9456	0.8822	0.7873	0.6652	0.5269
	6	1.0000	0.9999	0.9993	0.9961	0.9857	0.9614	0.9154	0.8418	0.7393
	7	1.0000	1.0000	0.9999	0.9994	0.9972	0.9905	0.9745	0.9427	0.8883
	8	1.0000	1.0000	1.0000	0.9999	0.9996	0.9983	0.9944	0.9847	0.9644
	9	1.0000	1.0000	1.0000	1.0000	1.0000	0.9998	0.9992	0.9972	0.9921
	10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.9999	0.9997	0.9989
	11	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.9999
13	0	0.5133	0.2542	0.1209	0.0550	0.0238	0.0097	0.0037	0.0013	0.0004
	1	0.8646	0.6213	0.3983	0.2336	0.1267	0.0637	0.0296	0.0126	0.0049
	2	0.9755	0.8661	0.6920	0.5017	0.3326	0.2025	0.1132	0.0579	0.0269
	3	0.9969	0.9658	0.8820	0.7473	0.5843	0.4206	0.2783	0.1686	0.0929
	4	0.9997	0.9935	0.9658	0.9009	0.7940	0.6543	0.5005	0.3530	0.2279
	5	1.0000	0.9991	0.9925	0.9700	0.9198	0.8346	0.7159	0.5744	0.4268
	6	1.0000	0.9999	0.9987	0.9930	0.9757	0.9376	0.8705	0.7712	0.6437
	7	1.0000	1.0000	0.9998	0.9988	0.9944	0.9818	0.9538	0.9023	0.8212
	8	1.0000	1.0000	1.0000	0.9998	0.9990	0.9960	0.9874	0.9679	0.9302
	9	1.0000	1.0000	1.0000	1.0000	0.9999	0.9993	0.9975	0.9922	0.9797
	10	1.0000	1.0000	1.0000	1.0000	1.0000	0.9999	0.9997	0.9987	0.9959
	11	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.9999	0.9995
12	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	
14	0	0.4877	0.2288	0.1028	0.0440	0.0178	0.0068	0.0024	0.0008	0.0002
	1	0.8470	0.5846	0.3567	0.1979	0.1010	0.0475	0.0205	0.0081	0.0029
	2	0.9699	0.8416	0.6479	0.4481	0.2811	0.1608	0.0839	0.0398	0.0170
	3	0.9958	0.9559	0.8535	0.6982	0.5213	0.3552	0.2205	0.1243	0.0632
	4	0.9996	0.9908	0.9533	0.8702	0.7415	0.5842	0.4227	0.2793	0.1672
	5	1.0000	0.9985	0.9885	0.9561	0.8883	0.7805	0.6405	0.4859	0.3373
	6	1.0000	0.9998	0.9978	0.9884	0.9617	0.9067	0.8164	0.6925	0.5461
	7	1.0000	1.0000	0.9997	0.9976	0.9897	0.9685	0.9247	0.8499	0.7414
	8	1.0000	1.0000	1.0000	0.9999	0.9978	0.9855	0.9617	0.9417	0.8811
	9	1.0000	1.0000	1.0000	1.0000	0.9997	0.9983	0.9940	0.9825	0.9574
	10	1.0000	1.0000	1.0000	1.0000	1.0000	0.9998	0.9989	0.9961	0.9886
	11	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.9999	0.9994	0.9978
12	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.9999	0.9997	
13	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	
14	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	

TABLE A3 (Continued)

n	y	p = 0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95
12	0	0.0002	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	1	0.0032	0.0011	0.0003	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	2	0.0193	0.0079	0.0028	0.0008	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000
	3	0.0730	0.0356	0.0153	0.0056	0.0017	0.0004	0.0000	0.0000	0.0000	0.0000
	4	0.1938	0.1117	0.0573	0.0255	0.0095	0.0028	0.0006	0.0001	0.0000	0.0000
	5	0.3872	0.2607	0.1582	0.0846	0.0386	0.0143	0.0039	0.0007	0.0001	0.0000
	6	0.6128	0.4731	0.3348	0.2127	0.1178	0.0544	0.0194	0.0046	0.0005	0.0000
	7	0.8062	0.6956	0.5618	0.4167	0.2763	0.1576	0.0726	0.0239	0.0043	0.0002
	8	0.9270	0.8655	0.7747	0.6533	0.5075	0.3512	0.2054	0.0922	0.0256	0.0022
	9	0.9807	0.9579	0.9166	0.8487	0.7472	0.6093	0.4417	0.2642	0.1109	0.0196
	10	0.9968	0.9917	0.9804	0.9576	0.9150	0.8416	0.7251	0.5565	0.3410	0.1184
	11	0.9998	0.9992	0.9978	0.9943	0.9862	0.9683	0.9313	0.8578	0.7176	0.4596
13	0	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	1	0.0017	0.0005	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	2	0.0112	0.0041	0.0013	0.0003	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
	3	0.0461	0.0203	0.0078	0.0025	0.0007	0.0001	0.0000	0.0000	0.0000	0.0000
	4	0.1334	0.0698	0.0321	0.0126	0.0040	0.0010	0.0002	0.0000	0.0000	0.0000
	5	0.2905	0.1788	0.0977	0.0462	0.0182	0.0056	0.0012	0.0002	0.0000	0.0000
	6	0.5000	0.3563	0.2288	0.1295	0.0624	0.0243	0.0070	0.0013	0.0001	0.0000
	7	0.7095	0.5732	0.4256	0.2841	0.1654	0.0802	0.0300	0.0075	0.0009	0.0000
	8	0.8666	0.7721	0.6470	0.4995	0.3457	0.2060	0.0991	0.0342	0.0065	0.0003
	9	0.9539	0.9071	0.8314	0.7217	0.5794	0.4157	0.2527	0.1180	0.0342	0.0031
	10	0.9888	0.9731	0.9421	0.8868	0.7975	0.6674	0.4983	0.3080	0.1339	0.0245
	11	0.9983	0.9951	0.9874	0.9704	0.9363	0.8733	0.7664	0.6017	0.3787	0.1354
14	0	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	1	0.0009	0.0003	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	2	0.0065	0.0022	0.0006	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	3	0.0287	0.0114	0.0039	0.0011	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000
	4	0.0898	0.0426	0.0175	0.0060	0.0017	0.0003	0.0000	0.0000	0.0000	0.0000
	5	0.2120	0.1189	0.0583	0.0243	0.0083	0.0022	0.0004	0.0000	0.0000	0.0000
	6	0.3953	0.2586	0.1501	0.0753	0.0315	0.0103	0.0024	0.0003	0.0000	0.0000
	7	0.6047	0.4539	0.3075	0.1836	0.0933	0.0383	0.0116	0.0022	0.0002	0.0000
	8	0.7880	0.6627	0.5141	0.3595	0.2195	0.1117	0.0439	0.0115	0.0015	0.0000
	9	0.9102	0.8328	0.7207	0.5773	0.4158	0.2585	0.1298	0.0467	0.0092	0.0004
	10	0.9713	0.9368	0.8757	0.7795	0.6448	0.4787	0.3018	0.1465	0.0441	0.0042
	11	0.9935	0.9830	0.9602	0.9161	0.8392	0.7189	0.5519	0.3521	0.1584	0.0301
15	0	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	1	0.0009	0.0003	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	2	0.0065	0.0022	0.0006	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	3	0.0287	0.0114	0.0039	0.0011	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000
	4	0.0898	0.0426	0.0175	0.0060	0.0017	0.0003	0.0000	0.0000	0.0000	0.0000
	5	0.2120	0.1189	0.0583	0.0243	0.0083	0.0022	0.0004	0.0000	0.0000	0.0000
	6	0.3953	0.2586	0.1501	0.0753	0.0315	0.0103	0.0024	0.0003	0.0000	0.0000
	7	0.6047	0.4539	0.3075	0.1836	0.0933	0.0383	0.0116	0.0022	0.0002	0.0000
	8	0.7880	0.6627	0.5141	0.3595	0.2195	0.1117	0.0439	0.0115	0.0015	0.0000
	9	0.9102	0.8328	0.7207	0.5773	0.4158	0.2585	0.1298	0.0467	0.0092	0.0004
	10	0.9713	0.9368	0.8757	0.7795	0.6448	0.4787	0.3018	0.1465	0.0441	0.0042
	11	0.9935	0.9830	0.9602	0.9161	0.8392	0.7189	0.5519	0.3521	0.1584	0.0301
16	0	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	1	0.0009	0.0003	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	2	0.0065	0.0022	0.0006	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	3	0.0287	0.0114	0.0039	0.0011	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000
	4	0.0898	0.0426	0.0175	0.0060	0.0017	0.0003	0.0000	0.0000	0.0000	0.0000
	5	0.2120	0.1189	0.0583	0.0243	0.0083	0.0022	0.0004	0.0000	0.0000	0.0000
	6	0.3953	0.2586	0.1501	0.0753	0.0315	0.0103	0.0024	0.0003	0.0000	0.0000
	7	0.6047	0.4539	0.3075	0.1836	0.0933	0.0383	0.0116	0.0022	0.0002	0.0000
	8	0.7880	0.6627	0.5141	0.3595	0.2195	0.1117	0.0439	0.0115	0.0015	0.0000
	9	0.9102	0.8328	0.7207	0.5773	0.4158	0.2585	0.1298	0.0467	0.0092	0.0004
	10	0.9713	0.9368	0.8757	0.7795	0.6448	0.4787	0.3018	0.1465	0.0441	0.0042
	11	0.9935	0.9830	0.9602	0.9161	0.8392	0.7189	0.5519	0.3521	0.1584	0.0301
17	0	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	1	0.0009	0.0003	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	2	0.0065	0.0022	0.0006	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	3	0.0287	0.0114	0.0039	0.0011	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000
	4	0.0898	0.0426	0.0175	0.0060	0.0017	0.0003	0.0000	0.0000	0.0000	0.0000
	5	0.2120	0.1189	0.0583	0.0243	0.0083	0.0022	0.0004	0.0000	0.0000	0.0000
	6	0.3953	0.2586	0.1501	0.0753	0.0315	0.0103	0.0024	0.0003	0.0000	0.0000
	7	0.6047	0.4539	0.3075	0.1836	0.0933	0.0383	0.0116	0.0022	0.0002	0.0000
	8	0.7880	0.6627	0.5141	0.3595	0.2195	0.1117	0.0439	0.0115	0.0015	0.0000
	9	0.9102	0.8328	0.7207	0.5773	0.4158	0.2585	0.1298	0.0467	0.0092	0.0004
	10	0.9713	0.9368	0.8757	0.7795	0.6448	0.4787	0.3018	0.1465	0.0441	0.0042
	11	0.9935	0.9830	0.9602	0.9161	0.8392	0.7189	0.5519	0.3521	0.1584	0.0301
18	0	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	1	0.0009	0.0003	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	2	0.0065	0.0022	0.0006	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	3	0.0287	0.0114	0.0039	0.0011	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000
	4	0.0898	0.0426	0.0175	0.0060	0.0017	0.0003	0.0000	0.0000	0.0000	0.0000
	5	0.2120	0.1189	0.0583	0.0243	0.0083	0.0022	0.0004	0.0000	0.0000	0.0000
	6	0.3953	0.2586	0.1501	0.0753	0.0315	0.0103	0.0024	0.0003	0.0000	0.0000
	7	0.6047	0.4539	0.3075	0.1836	0.0933	0.0383	0.0116	0.0022	0.0002	0.0000
	8	0.7880	0.6627	0.5141	0.3595	0.2195	0.1117	0.0439	0.0115	0.0015	0.0000
	9	0.9102	0.8328	0.7207	0.5773	0.4158	0.2585	0.1298	0.0467	0.0092	0.0004
	10	0.9713	0.9368	0.8757	0.7795	0.6448	0.4787	0.3018	0.1465	0.0441	0.0042
	11	0.9935	0.9830	0.9602	0.9161	0.8392	0.7189	0.5519	0.3521	0.1584	0.0301
19	0	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	1	0.0009	0.0003	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	2	0.0065	0.0022	0.0006	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	3	0.0287	0.0114	0.0039	0.0011	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000
	4	0.0898	0.0426	0.0175	0.0060	0.0017	0.0003	0.0000	0.0000	0.0000	0.0000
	5	0.2120	0.1189	0.0583	0.0243	0.0083	0.0022	0.0004	0.0000	0.0000	0.0000
	6	0.3953	0.2586	0.1501	0.0753	0.0315	0.0103	0.0024	0.0003	0.0000	0.0000
	7	0.6047	0.4539	0.3075	0.1836	0.0933	0.0383	0.0116	0.0022	0.0002	0.0000
	8	0.7880	0.6627	0.5141	0.3595	0.2195	0.1117	0.0439	0.0115	0.0015	0.0000
	9	0.9102	0.8328	0.7207	0.5773	0.4158	0.2585	0.1298	0.0467	0.0092	0.0004
	10	0.9713	0.9368	0.8757	0.7795	0.6448	0.4787	0.3018	0.1465	0.0441	0.0042
	11	0.9935	0.9830	0.9602	0.9161	0.8392	0.7189	0.5519	0.3521	0.1584	0.0301
20	0	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	1	0.0009	0.0003	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	2	0.0065	0.0022	0.0006	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	

TABLE A3 (Continued)

n	y	$p = 0.50$	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95
15	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	1	0.0005	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	2	0.0037	0.0011	0.0003	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	3	0.0176	0.0063	0.0019	0.0005	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
	4	0.0592	0.0255	0.0093	0.0028	0.0007	0.0001	0.0000	0.0000	0.0000	0.0000
	5	0.1509	0.0769	0.0338	0.0124	0.0037	0.0008	0.0001	0.0000	0.0000	0.0000
	6	0.3036	0.1818	0.0950	0.0422	0.0152	0.0042	0.0008	0.0001	0.0000	0.0000
	7	0.5000	0.3465	0.2131	0.1132	0.0500	0.0173	0.0042	0.0006	0.0000	0.0000
	8	0.6964	0.5478	0.3902	0.2452	0.1311	0.0566	0.0181	0.0036	0.0003	0.0000
	9	0.8491	0.7392	0.5968	0.4357	0.2784	0.1484	0.0611	0.0168	0.0022	0.0001
	10	0.9408	0.8796	0.7827	0.6481	0.4845	0.3135	0.1642	0.0617	0.0127	0.0006
	11	0.9824	0.9576	0.9095	0.8273	0.7031	0.5387	0.3518	0.1773	0.0556	0.0055
	12	0.9963	0.9893	0.9729	0.9383	0.8732	0.7639	0.6020	0.3958	0.1841	0.0362
	13	0.9995	0.9983	0.9948	0.9858	0.9647	0.9198	0.8329	0.6814	0.4510	0.1710
	14	1.0000	0.9999	0.9995	0.9984	0.9953	0.9866	0.9648	0.9126	0.7941	0.5367
	15	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
16	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	1	0.0003	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	2	0.0021	0.0006	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	3	0.0106	0.0035	0.0009	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	4	0.0384	0.0149	0.0049	0.0013	0.0003	0.0000	0.0000	0.0000	0.0000	0.0000
	5	0.1051	0.0486	0.0191	0.0062	0.0016	0.0003	0.0000	0.0000	0.0000	0.0000
	6	0.2272	0.1241	0.0583	0.0229	0.0071	0.0016	0.0002	0.0000	0.0000	0.0000
	7	0.4018	0.2559	0.1423	0.0671	0.0257	0.0075	0.0015	0.0002	0.0000	0.0000
	8	0.5982	0.4371	0.2839	0.1594	0.0744	0.0271	0.0070	0.0011	0.0001	0.0000
	9	0.7728	0.6340	0.4728	0.3119	0.1753	0.0796	0.0267	0.0056	0.0005	0.0000
	10	0.8949	0.8024	0.6712	0.5100	0.3402	0.1897	0.0817	0.0235	0.0033	0.0001
	11	0.9616	0.9147	0.8334	0.7108	0.5501	0.3698	0.2018	0.0791	0.0170	0.0009
	12	0.9894	0.9719	0.9349	0.8661	0.7541	0.5950	0.4019	0.2101	0.0684	0.0070
	13	0.9979	0.9934	0.9817	0.9549	0.9006	0.8029	0.6482	0.4386	0.2108	0.0429
	14	0.9997	0.9990	0.9967	0.9902	0.9739	0.9365	0.8593	0.7161	0.4853	0.1892
	15	1.0000	0.9999	0.9997	0.9990	0.9967	0.9900	0.9719	0.9257	0.8147	0.5399
	16	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

TABLE A3 (Continued)

n	y	$p = 0.05$	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45
17	0	0.4181	0.1668	0.0631	0.0225	0.0075	0.0023	0.0007	0.0002	0.0000
	1	0.7922	0.4818	0.2525	0.1182	0.0501	0.0193	0.0067	0.0021	0.0006
	2	0.9497	0.7618	0.5198	0.3096	0.1637	0.0774	0.0327	0.0123	0.0041
	3	0.9912	0.9174	0.7556	0.5489	0.3530	0.2019	-0.1028	0.0464	0.0184
	4	0.9988	0.9779	0.9013	0.7582	0.5739	0.3887	0.2348	0.1260	0.0596
	5	0.9999	0.9953	0.9681	0.8943	0.7653	0.5968	0.4197	0.2639	0.1471
	6	1.0000	0.9992	0.9917	0.9623	0.8929	0.7752	0.6188	0.4478	0.2902
	7	1.0000	0.9999	0.9983	0.9891	0.9598	0.8954	0.7872	0.6405	0.4743
	8	1.0000	1.0000	0.9997	0.9974	0.9876	0.9597	0.9006	0.8011	0.6626
	9	1.0000	1.0000	1.0000	0.9995	0.9969	0.9873	0.9617	0.9081	0.8166
	10	1.0000	1.0000	1.0000	0.9999	0.9994	0.9968	0.9880	0.9652	0.9174
	11	1.0000	1.0000	1.0000	1.0000	1.0000	0.9999	0.9999	0.9975	0.9914
	12	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.9999	0.9995	0.9981
	13	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.9999	0.9997
	14	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
	15	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
	16	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
	17	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
18	0	0.3972	0.1501	0.0536	0.0180	0.0056	0.0016	0.0004	0.0001	0.0000
	1	0.7735	0.4503	0.2241	0.0991	0.0395	0.0142	0.0046	0.0013	0.0003
	2	0.9419	0.7338	0.4797	0.2713	0.1353	0.0600	0.0236	0.0082	0.0025
	3	0.9891	0.9018	0.7202	0.5010	0.3057	0.1646	0.0783	0.0328	0.0120
	4	0.9985	0.9718	0.8794	0.7164	0.5187	0.3327	0.1886	0.0942	0.0411
	5	0.9998	0.9936	0.9581	0.8671	0.7175	0.5344	0.3550	0.2088	0.1077
	6	1.0000	0.9988	0.9882	0.9487	0.8610	0.7217	0.5491	0.3743	0.2258
	7	1.0000	0.9998	0.9973	0.9837	0.9431	0.8593	0.7283	0.5634	0.3915
	8	1.0000	1.0000	0.9995	0.9957	0.9807	0.9404	0.8609	0.7368	0.5778
	9	1.0000	1.0000	0.9999	0.9991	0.9946	0.9790	0.9403	0.8653	0.7473
	10	1.0000	1.0000	1.0000	0.9998	0.9938	0.9939	0.9788	0.9424	0.8720
	11	1.0000	1.0000	1.0000	1.0000	0.9998	0.9986	0.9938	0.9797	0.9463
	12	1.0000	1.0000	1.0000	1.0000	1.0000	0.9997	0.9986	0.9942	0.9817
	13	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.9997	0.9987	0.9951
	14	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.9998	0.9990
	15	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.9999
	16	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
	17	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
	18	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

TABLE A3 (Continued)

<i>n</i>	<i>y</i>	<i>p</i> = 0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95
17	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	1	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	2	0.0012	0.0003	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	3	0.0064	0.0019	0.0005	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	4	0.0245	0.0086	0.0025	0.0006	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
	5	0.0717	0.0301	0.0106	0.0030	0.0007	0.0001	0.0000	0.0000	0.0000	0.0000
	6	0.1662	0.0826	0.0348	0.0120	0.0032	0.0006	0.0001	0.0000	0.0000	0.0000
	7	0.3145	0.1834	0.0919	0.0383	0.0127	0.0031	0.0005	0.0000	0.0000	0.0000
	8	0.5000	0.3374	0.1989	0.0994	0.0403	0.0124	0.0026	0.0003	0.0000	0.0000
	9	0.6855	0.5357	0.3595	0.2128	0.1046	0.0402	0.0109	0.0017	0.0001	0.0000
	10	0.8338	0.7098	0.5522	0.3812	0.2248	0.1071	0.0377	0.0083	0.0008	0.0000
	11	0.9283	0.8529	0.7361	0.5803	0.4032	0.2347	0.1057	0.0319	0.0047	0.0001
	12	0.9755	0.9404	0.8740	0.7652	0.6113	0.4261	0.2418	0.0987	0.0221	0.0012
	13	0.9936	0.9816	0.9536	0.8972	0.7981	0.6470	0.4511	0.2444	0.0826	0.0088
	14	0.9988	0.9959	0.9877	0.9673	0.9226	0.8363	0.6904	0.4802	0.2382	0.0503
	15	0.9999	0.9994	0.9979	0.9933	0.9807	0.9499	0.8818	0.7475	0.5182	0.2078
	16	1.0000	1.0000	0.9998	0.9993	0.9977	0.9925	0.9775	0.9369	0.8332	0.5819
17	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	
18	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	1	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	2	0.0007	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	3	0.0038	0.0010	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	4	0.0154	0.0049	0.0013	0.0003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	5	0.0481	0.0183	0.0058	0.0014	0.0003	0.0000	0.0000	0.0000	0.0000	0.0000
	6	0.1189	0.0537	0.0203	0.0062	0.0014	0.0002	0.0000	0.0000	0.0000	0.0000
	7	0.2403	0.1280	0.0576	0.0212	0.0061	0.0012	0.0002	0.0000	0.0000	0.0000
	8	0.4073	0.2527	0.1347	0.0597	0.0210	0.0054	0.0009	0.0001	0.0000	0.0000
	9	0.5927	0.4222	0.2632	0.1391	0.0596	0.0193	0.0043	0.0005	0.0000	0.0000
	10	0.7597	0.6085	0.4366	0.2717	0.1407	0.0569	0.0163	0.0027	0.0002	0.0000
	11	0.8811	0.7742	0.6257	0.4509	0.2783	0.1390	0.0513	0.0118	0.0012	0.0000
	12	0.9519	0.8923	0.7912	0.6450	0.4656	0.2825	0.1329	0.0419	0.0064	0.0002
	13	0.9846	0.9589	0.9058	0.8114	0.6873	0.4813	0.2836	0.1206	0.0282	0.0015
	14	0.9962	0.9880	0.9672	0.9217	0.8354	0.6943	0.4990	0.2798	0.0982	0.0109
	15	0.9993	0.9975	0.9918	0.9764	0.9400	0.8647	0.7287	0.5203	0.2662	0.0581
	16	0.9999	0.9997	0.9987	0.9954	0.9858	0.9605	0.9009	0.7759	0.5497	0.2265
	17	1.0000	1.0000	0.9999	0.9996	0.9984	0.9944	0.9820	0.9464	0.8499	0.6028
18	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	

TABLE A3 (Continued)

n	y	p = 0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45
19	0	0.3774	0.1351	0.0456	0.0144	0.0042	0.0011	0.0003	0.0001	0.0000
	1	0.7547	0.4203	0.1985	0.0829	0.0310	0.0104	0.0031	0.0008	0.0002
	2	0.9335	0.7054	0.4413	0.2369	0.1113	0.0462	0.0170	0.0055	0.0015
	3	0.9868	0.8850	0.6841	0.4551	0.2631	0.1332	0.0591	0.0230	0.0077
	4	0.9980	0.9648	0.8556	0.6733	0.4654	0.2822	0.1500	0.0696	0.0280
	5	0.9998	0.9914	0.9463	0.8369	0.6678	0.4739	0.2968	0.1629	0.0777
	6	1.0000	0.9983	0.9837	0.9324	0.8251	0.6655	0.4812	0.3081	0.1727
	7	1.0000	0.9997	0.9959	0.9767	0.9225	0.8180	0.6656	0.4878	0.3169
	8	1.0000	1.0000	0.9992	0.9933	0.9713	0.9161	0.8145	0.6675	0.4940
	9	1.0000	1.0000	0.9999	0.9984	0.9911	0.9674	0.9125	0.8139	0.6710
20	0	0.3585	0.1216	0.0388	0.0115	0.0032	0.0008	0.0002	0.0000	0.0000
	1	0.7358	0.3917	0.1756	0.0692	0.0243	0.0076	0.0021	0.0005	0.0001
	2	0.9245	0.6769	0.4049	0.2061	0.0913	0.0355	0.0121	0.0036	0.0009
	3	0.9841	0.8670	0.6477	0.4114	0.2252	0.1071	0.0444	0.0160	0.0049
	4	0.9974	0.9568	0.8298	0.6296	0.4148	0.2375	0.1182	0.0510	0.0189
	5	0.9997	0.9887	0.9327	0.8042	0.6172	0.4164	0.2454	0.1256	0.0553
	6	1.0000	0.9976	0.9781	0.9133	0.7858	0.6080	0.4166	0.2500	0.1299
	7	1.0000	0.9996	0.9941	0.9679	0.8932	0.7723	0.6010	0.4159	0.2520
	8	1.0000	0.9999	0.9987	0.9900	0.9591	0.8867	0.7624	0.5956	0.4143
	9	1.0000	1.0000	0.9998	0.9974	0.9661	0.9520	0.8782	0.7553	0.5914
	10	1.0000	1.0000	1.0000	0.9994	0.9961	0.9829	0.9468	0.8725	0.7507
	11	1.0000	1.0000	1.0000	0.9999	0.9991	0.9949	0.9804	0.9435	0.8692
	12	1.0000	1.0000	1.0000	1.0000	0.9998	0.9987	0.9940	0.9790	0.9420
	13	1.0000	1.0000	1.0000	1.0000	1.0000	0.9997	0.9985	0.9973	0.9786
	14	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.9997	0.9984	0.9936
	15	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.9997	0.9985
	16	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.9997
	17	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
	18	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
	19	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
20	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	

TABLE A3 (Continued)

n	y	p = 0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95
19	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	2	0.0004	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	3	0.0022	0.0005	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	4	0.0096	0.0028	0.0006	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	5	0.0318	0.0109	0.0031	0.0007	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
	6	0.0835	0.0342	0.0116	0.0031	0.0006	0.0001	0.0000	0.0000	0.0000	0.0000
	7	0.1796	0.0871	0.0352	0.0114	0.0028	0.0005	0.0000	0.0000	0.0000	0.0000
	8	0.3238	0.1841	0.0885	0.0347	0.0105	0.0023	0.0003	0.0000	0.0000	0.0000
	9	0.5000	0.3290	0.1861	0.0875	0.0326	0.0089	0.0016	0.0001	0.0000	0.0000
	10	0.6762	0.5060	0.3325	0.1855	0.0839	0.0287	0.0067	0.0008	0.0000	0.0000
	11	0.8204	0.6831	0.5122	0.3344	0.1820	0.0775	0.0233	0.0041	0.0003	0.0000
	12	0.9165	0.8273	0.6919	0.5188	0.3345	0.1749	0.0676	0.0163	0.0017	0.0000
	13	0.9682	0.9223	0.8371	0.7032	0.5261	0.3322	0.1631	0.0537	0.0086	0.0002
	14	0.9904	0.9720	0.9304	0.8500	0.7178	0.5346	0.3267	0.1444	0.0352	0.0020
	15	0.9978	0.9923	0.9770	0.9409	0.8668	0.7369	0.5449	0.3159	0.1150	0.0132
	16	0.9996	0.9985	0.9945	0.9830	0.9538	0.8887	0.7631	0.5587	0.2946	0.0665
	17	1.0000	0.9998	0.9992	0.9969	0.9896	0.9690	0.9171	0.8015	0.5797	0.2453
	18	1.0000	1.0000	0.9999	0.9997	0.9989	0.9958	0.9856	0.9544	0.8649	0.6226
	19	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
20	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	2	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	3	0.0013	0.0003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	4	0.0059	0.0015	0.0003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	5	0.0207	0.0064	0.0016	0.0003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	6	0.0577	0.0214	0.0065	0.0015	0.0003	0.0000	0.0000	0.0000	0.0000	0.0000
	7	0.1316	0.0580	0.0210	0.0060	0.0013	0.0002	0.0000	0.0000	0.0000	0.0000
	8	0.2517	0.1308	0.0565	0.0196	0.0051	0.0009	0.0001	0.0000	0.0000	0.0000
	9	0.4119	0.2493	0.1275	0.0532	0.0171	0.0039	0.0006	0.0000	0.0000	0.0000
	10	0.5881	0.4086	0.2447	0.1218	0.0480	0.0139	0.0026	0.0002	0.0000	0.0000
	11	0.7483	0.5857	0.4044	0.2376	0.1133	0.0409	0.0100	0.0013	0.0001	0.0000
	12	0.8684	0.7480	0.5841	0.3990	0.2277	0.1018	0.0321	0.0059	0.0004	0.0000
	13	0.9423	0.8701	0.7500	0.5834	0.3920	0.2142	0.0867	0.0219	0.0024	0.0000
	14	0.9793	0.9447	0.8744	0.7546	0.5836	0.3828	0.1958	0.0673	0.0113	0.0003
	15	0.9941	0.9811	0.9490	0.8818	0.7625	0.5852	0.3704	0.1702	0.0432	0.0026
	16	0.9987	0.9951	0.9840	0.9556	0.8929	0.7748	0.5886	0.3523	0.1330	0.0159
	17	0.9998	0.9991	0.9964	0.9879	0.9645	0.9087	0.7939	0.5951	0.3231	0.0755
	18	1.0000	0.9999	0.9995	0.9979	0.9924	0.9757	0.9308	0.8244	0.6083	0.2642
	19	1.0000	1.0000	1.0000	0.9998	0.9992	0.9968	0.9885	0.9612	0.8784	0.6415
	20	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

*Y has the binomial distribution with parameters n and p. The entries are the values of $P(Y \leq y) = \sum_{i=0}^y \binom{n}{i} p^i (1-p)^{n-i}$ for p ranging from 0.05 to 0.95. For n larger than 20, the rth quantile y_r of a binomial random variable may be approximated using $y_r = np + z_r \sqrt{np(1-p)}$, where z_r is the rth quantile of a standard normal random variable, obtained from Table A1.

TABLE A4 Exact Confidence Intervals for the Binomial Parameter p

n	y	90%		95%		99%	
		Lower	Upper	Lower	Upper	Lower	Upper
1	0	0.000	0.950	0.000	0.975	0.000	0.995
	1	0.050	1.000	0.025	1.000	0.005	1.000
2	0	0.000	0.776	0.000	0.842	0.000	0.929
	1	0.025	0.975	0.013	0.967	0.003	0.997
	2	0.224	1.000	0.158	1.000	0.071	1.000
3	0	0.000	0.632	0.000	0.708	0.000	0.829
	1	0.017	0.865	0.008	0.906	0.002	0.959
	2	0.135	0.983	0.094	0.992	0.041	0.998
	3	0.368	1.000	0.292	1.000	0.171	1.000
4	0	0.000	0.527	0.000	0.602	0.000	0.734
	1	0.013	0.751	0.006	0.806	0.001	0.889
	2	0.098	0.902	0.068	0.932	0.029	0.971
	3	0.249	0.987	0.194	0.994	0.111	0.999
	4	0.473	1.000	0.398	1.000	0.266	1.000
5	0	0.000	0.451	0.000	0.522	0.000	0.653
	1	0.010	0.657	0.005	0.716	0.001	0.815
	2	0.076	0.811	0.053	0.853	0.023	0.917
	3	0.189	0.924	0.147	0.947	0.083	0.977
	4	0.343	0.990	0.284	0.995	0.185	0.999
	5	0.549	1.000	0.478	1.000	0.347	1.000
6	0	0.000	0.393	0.000	0.459	0.000	0.586
	1	0.009	0.582	0.004	0.641	0.001	0.746
	2	0.063	0.779	0.043	0.777	0.019	0.856
	3	0.153	0.847	0.118	0.882	0.066	0.934
	4	0.271	0.937	0.223	0.957	0.144	0.981
	5	0.418	0.991	0.359	0.976	0.254	0.999
	6	0.607	1.000	0.541	1.000	0.414	1.000
7	0	0.000	0.348	0.000	0.410	0.000	0.531
	1	0.007	0.521	0.004	0.579	0.001	0.685
	2	0.053	0.659	0.037	0.710	0.016	0.797
	3	0.129	0.775	0.099	0.816	0.055	0.882
	4	0.225	0.871	0.184	0.901	0.118	0.945
	5	0.341	0.947	0.290	0.963	0.203	0.984
	6	0.479	0.993	0.421	0.996	0.315	0.999
	7	0.652	1.000	0.590	1.000	0.469	1.000

TABLE A4 (Continued)

n	Y	90%		95%		99%	
		Lower	Upper	Lower	Upper	Lower	Upper
12	0	0.000	0.221	0.000	0.265	0.000	0.357
	1	0.004	0.339	0.002	0.385	0.000	0.477
	2	0.030	0.438	0.021	0.484	0.009	0.573
	3	0.072	0.527	0.055	0.572	0.030	0.655
	4	0.123	0.609	0.099	0.651	0.062	0.728
	5	0.181	0.685	0.152	0.723	0.103	0.792
	6	0.245	0.755	0.211	0.789	0.152	0.848
	7	0.315	0.819	0.277	0.848	0.208	0.897
	8	0.391	0.877	0.349	0.901	0.272	0.938
	9	0.473	0.928	0.428	0.945	0.345	0.970
	10	0.562	0.970	0.516	0.979	0.427	0.991
	11	0.661	0.996	0.615	0.998	0.523	1.000
13	0	0.000	0.206	0.000	0.247	0.000	0.335
	1	0.004	0.316	0.002	0.360	0.000	0.449
	2	0.028	0.410	0.019	0.454	0.008	0.541
	3	0.066	0.495	0.050	0.538	0.028	0.621
	4	0.113	0.573	0.091	0.614	0.057	0.691
	5	0.166	0.645	0.139	0.684	0.094	0.755
	6	0.224	0.713	0.192	0.749	0.138	0.811
	7	0.287	0.776	0.251	0.808	0.189	0.862
	8	0.355	0.834	0.316	0.861	0.245	0.906
	9	0.427	0.887	0.386	0.909	0.309	0.943
	10	0.505	0.934	0.462	0.950	0.379	0.972
	11	0.590	0.972	0.546	0.981	0.459	0.992
14	12	0.684	0.996	0.640	0.998	0.551	1.000
	13	0.794	1.000	0.753	1.000	0.665	1.000
	0	0.000	0.193	0.000	0.232	0.000	0.315
	1	0.004	0.297	0.002	0.339	0.000	0.424
	2	0.026	0.385	0.018	0.438	0.008	0.512
	3	0.061	0.466	0.047	0.508	0.026	0.589
	4	0.104	0.540	0.084	0.581	0.053	0.658
	5	0.153	0.610	0.128	0.649	0.087	0.720
	6	0.206	0.675	0.177	0.711	0.127	0.777
	7	0.264	0.736	0.230	0.770	0.172	0.828
	8	0.325	0.794	0.289	0.823	0.223	0.873
	9	0.390	0.847	0.351	0.872	0.280	0.913
	10	0.460	0.896	0.419	0.916	0.342	0.947
	11	0.534	0.939	0.492	0.953	0.411	0.974
	12	0.615	0.974	0.572	0.982	0.488	0.992
	13	0.703	0.996	0.661	0.998	0.576	1.000
	14	0.807	1.000	0.768	1.000	0.685	1.000

TABLE A4 (Continued)

n	Y	90%		95%		99%	
		Lower	Upper	Lower	Upper	Lower	Upper
8	0	0.000	0.312	0.000	0.369	0.000	0.484
	1	0.006	0.471	0.003	0.526	0.001	0.632
	2	0.046	0.600	0.032	0.651	0.014	0.742
	3	0.111	0.711	0.085	0.755	0.047	0.830
	4	0.193	0.807	0.157	0.843	0.100	0.900
	5	0.289	0.889	0.245	0.915	0.170	0.953
	6	0.400	0.954	0.349	0.968	0.258	0.986
	7	0.529	0.994	0.474	0.997	0.368	0.999
	8	0.688	1.000	0.631	1.000	0.516	1.000
	0	0.000	0.283	0.000	0.336	0.000	0.445
	1	0.006	0.429	0.003	0.482	0.001	0.585
9	2	0.041	0.550	0.028	0.600	0.012	0.693
	3	0.098	0.655	0.075	0.701	0.042	0.781
	4	0.169	0.749	0.137	0.788	0.087	0.854
	5	0.251	0.831	0.212	0.863	0.146	0.913
	6	0.345	0.902	0.299	0.925	0.219	0.958
	7	0.450	0.959	0.400	0.972	0.307	0.988
	8	0.571	0.994	0.518	0.997	0.415	0.999
	9	0.717	1.000	0.664	1.000	0.555	1.000
	0	0.000	0.259	0.000	0.308	0.000	0.411
	1	0.005	0.394	0.003	0.445	0.001	0.544
	2	0.037	0.507	0.025	0.556	0.011	0.648
10	3	0.087	0.607	0.067	0.652	0.037	0.735
	4	0.150	0.696	0.122	0.738	0.077	0.809
	5	0.222	0.778	0.187	0.813	0.128	0.872
	6	0.304	0.850	0.262	0.878	0.191	0.923
	7	0.393	0.913	0.348	0.933	0.265	0.963
	8	0.493	0.963	0.444	0.975	0.352	0.989
	9	0.606	0.995	0.555	0.997	0.456	0.999
	10	0.741	1.000	0.692	1.000	0.589	1.000
	0	0.000	0.238	0.000	0.285	0.000	0.382
	1	0.005	0.364	0.002	0.413	0.000	0.509
	2	0.033	0.470	0.023	0.518	0.010	0.608
11	3	0.079	0.564	0.060	0.610	0.033	0.693
	4	0.135	0.650	0.109	0.692	0.069	0.767
	5	0.200	0.729	0.167	0.766	0.115	0.831
	6	0.271	0.800	0.234	0.833	0.169	0.885
	7	0.350	0.865	0.308	0.891	0.233	0.931
	8	0.436	0.921	0.390	0.940	0.307	0.967
	9	0.530	0.967	0.482	0.977	0.392	0.990
	10	0.636	0.995	0.587	0.998	0.491	1.000
	11	0.762	1.000	0.715	1.000	0.618	1.000

TABLE A4 (Continued)

n	Y	90%		95%		99%	
		Lower	Upper	Lower	Upper	Lower	Upper
15	0	0.000	0.181	0.000	0.218	0.000	0.298
	1	0.003	0.279	0.002	0.319	0.000	0.402
	2	0.024	0.363	0.017	0.405	0.007	0.486
	3	0.057	0.440	0.043	0.481	0.024	0.561
	4	0.097	0.511	0.078	0.551	0.049	0.627
	5	0.142	0.577	0.118	0.616	0.080	0.688
	6	0.191	0.640	0.163	0.677	0.117	0.744
	7	0.244	0.700	0.213	0.734	0.159	0.795
	8	0.300	0.756	0.266	0.787	0.205	0.841
	9	0.360	0.809	0.323	0.837	0.256	0.883
	10	0.423	0.858	0.384	0.882	0.312	0.920
	11	0.489	0.903	0.449	0.922	0.373	0.951
	12	0.560	0.943	0.519	0.957	0.439	0.976
	13	0.637	0.976	0.595	0.983	0.514	0.993
	14	0.721	0.997	0.681	0.998	0.598	1.000
	15	0.819	1.000	0.782	1.000	0.702	1.000
16	0	0.000	0.171	0.000	0.206	0.000	0.282
	1	0.003	0.264	0.002	0.302	0.000	0.381
	2	0.023	0.344	0.016	0.383	0.007	0.463
	3	0.053	0.417	0.040	0.456	0.022	0.534
	4	0.090	0.484	0.073	0.524	0.045	0.599
	5	0.132	0.548	0.110	0.587	0.075	0.658
	6	0.178	0.609	0.152	0.646	0.109	0.713
	7	0.227	0.667	0.198	0.701	0.147	0.764
	8	0.279	0.721	0.247	0.753	0.190	0.810
	9	0.333	0.773	0.299	0.802	0.236	0.853
	10	0.391	0.822	0.354	0.848	0.287	0.891
	11	0.452	0.868	0.413	0.890	0.342	0.925
	12	0.516	0.910	0.476	0.927	0.401	0.955
	13	0.583	0.947	0.544	0.960	0.466	0.978
	14	0.656	0.977	0.617	0.984	0.537	0.993
	15	0.736	0.997	0.698	0.998	0.619	1.000
	16	0.829	1.000	0.794	1.000	0.718	1.000

TABLE A4 (Continued)

n	Y	90%		95%		99%	
		Lower	Upper	Lower	Upper	Lower	Upper
17	0	0.000	0.162	0.000	0.195	0.000	0.268
	1	0.003	0.250	0.001	0.287	0.000	0.363
	2	0.021	0.326	0.015	0.364	0.006	0.441
	3	0.050	0.396	0.038	0.434	0.021	0.510
	4	0.085	0.461	0.068	0.499	0.043	0.573
	5	0.124	0.522	0.103	0.560	0.070	0.631
	6	0.166	0.580	0.142	0.617	0.101	0.685
	7	0.212	0.636	0.184	0.671	0.137	0.734
	8	0.260	0.689	0.230	0.722	0.176	0.781
	9	0.311	0.740	0.278	0.770	0.219	0.824
	10	0.364	0.788	0.329	0.816	0.266	0.863
	11	0.420	0.834	0.383	0.858	0.315	0.899
	12	0.478	0.876	0.440	0.897	0.369	0.930
	13	0.539	0.915	0.501	0.932	0.427	0.957
	14	0.604	0.950	0.566	0.962	0.490	0.979
	15	0.674	0.979	0.636	0.985	0.559	0.994
	16	0.750	0.997	0.713	0.999	0.637	1.000
	17	0.838	1.000	0.805	1.000	0.732	1.000
18	0	0.000	0.153	0.000	0.185	0.000	0.255
	1	0.003	0.238	0.001	0.273	0.000	0.346
	2	0.020	0.310	0.014	0.347	0.006	0.422
	3	0.047	0.377	0.036	0.414	0.020	0.488
	4	0.080	0.439	0.064	0.476	0.040	0.549
	5	0.116	0.498	0.097	0.535	0.065	0.605
	6	0.156	0.554	0.133	0.590	0.095	0.658
	7	0.199	0.608	0.173	0.643	0.128	0.707
	8	0.244	0.659	0.215	0.692	0.165	0.753
	9	0.291	0.709	0.260	0.740	0.205	0.795
	10	0.341	0.756	0.308	0.785	0.247	0.835
	11	0.392	0.801	0.357	0.827	0.293	0.872
	12	0.446	0.844	0.410	0.867	0.342	0.905
	13	0.502	0.884	0.465	0.903	0.395	0.935
	14	0.561	0.920	0.524	0.936	0.451	0.960
	15	0.623	0.953	0.586	0.964	0.512	0.980
	16	0.690	0.980	0.653	0.986	0.578	0.994
	17	0.762	0.997	0.727	0.999	0.654	1.000
	18	0.847	1.000	0.815	1.000	0.745	1.000

TABLE A4 (Continued)

n	Y	90%		95%		99%	
		Lower	Upper	Lower	Upper	Lower	Upper
21	0	0.000	0.133	0.000	0.161	0.000	0.223
	1	0.002	0.207	0.001	0.238	0.000	0.304
	2	0.017	0.271	0.012	0.304	0.005	0.372
	3	0.040	0.329	0.030	0.363	0.017	0.432
	4	0.068	0.384	0.054	0.419	0.034	0.488
	5	0.099	0.437	0.082	0.472	0.055	0.539
	6	0.132	0.487	0.113	0.522	0.080	0.588
	7	0.168	0.536	0.146	0.570	0.108	0.634
	8	0.206	0.583	0.181	0.616	0.138	0.677
	9	0.245	0.628	0.218	0.660	0.171	0.719
	10	0.286	0.672	0.257	0.702	0.205	0.758
	11	0.328	0.714	0.298	0.743	0.242	0.795
	12	0.372	0.755	0.340	0.782	0.281	0.829
	13	0.417	0.794	0.384	0.819	0.323	0.862
	14	0.464	0.832	0.430	0.854	0.366	0.892
	15	0.513	0.868	0.478	0.887	0.412	0.920
	16	0.563	0.901	0.528	0.918	0.461	0.945
	17	0.616	0.932	0.581	0.946	0.512	0.966
	18	0.671	0.960	0.637	0.970	0.568	0.983
	19	0.729	0.983	0.696	0.988	0.628	0.995
	20	0.793	0.998	0.762	0.999	0.696	1.000
22	0	0.000	0.127	0.000	0.154	0.000	0.214
	1	0.002	0.198	0.001	0.228	0.000	0.292
	2	0.016	0.259	0.011	0.292	0.005	0.358
	3	0.038	0.316	0.029	0.349	0.016	0.416
	4	0.065	0.369	0.052	0.403	0.032	0.470
	5	0.094	0.420	0.078	0.454	0.053	0.520
	6	0.126	0.468	0.107	0.502	0.076	0.567
	7	0.160	0.515	0.139	0.549	0.102	0.612
	8	0.196	0.561	0.172	0.593	0.131	0.655
	9	0.233	0.605	0.207	0.636	0.162	0.695
	10	0.271	0.647	0.244	0.678	0.195	0.734
	11	0.311	0.689	0.282	0.718	0.229	0.771
	12	0.353	0.729	0.322	0.756	0.266	0.805
	13	0.395	0.767	0.364	0.793	0.305	0.838
	14	0.439	0.804	0.407	0.828	0.345	0.869
	15	0.485	0.840	0.451	0.861	0.388	0.898
	16	0.532	0.874	0.498	0.893	0.433	0.924
	17	0.580	0.906	0.546	0.922	0.480	0.947
	18	0.631	0.935	0.597	0.950	0.530	0.968
	19	0.684	0.962	0.651	0.971	0.584	0.984
	20	0.741	0.984	0.708	0.989	0.642	0.995

TABLE A4 (Continued)

n	Y	90%		95%		99%	
		Lower	Upper	Lower	Upper	Lower	Upper
19	0	0.000	0.146	0.000	0.176	0.000	0.243
	1	0.003	0.226	0.001	0.260	0.000	0.331
	2	0.019	0.296	0.013	0.331	0.006	0.404
	3	0.044	0.359	0.034	0.396	0.019	0.468
	4	0.075	0.419	0.061	0.456	0.038	0.527
	5	0.110	0.476	0.091	0.512	0.062	0.582
	6	0.147	0.530	0.126	0.565	0.089	0.633
	7	0.188	0.582	0.163	0.616	0.121	0.681
	8	0.230	0.632	0.203	0.665	0.155	0.726
	9	0.274	0.680	0.244	0.711	0.192	0.768
	10	0.320	0.726	0.289	0.756	0.232	0.808
	11	0.368	0.770	0.335	0.797	0.274	0.845
	12	0.418	0.813	0.384	0.837	0.319	0.879
	13	0.470	0.853	0.435	0.874	0.367	0.911
	14	0.524	0.890	0.488	0.909	0.418	0.938
	15	0.581	0.925	0.544	0.939	0.473	0.962
	16	0.641	0.956	0.604	0.966	0.532	0.981
	17	0.704	0.981	0.669	0.987	0.596	0.994
	18	0.774	0.997	0.740	0.999	0.669	1.000
	19	0.854	1.000	0.824	1.000	0.757	1.000
20	0	0.000	0.139	0.000	0.168	0.000	0.233
	1	0.003	0.216	0.001	0.249	0.000	0.317
	2	0.018	0.283	0.012	0.317	0.005	0.387
	3	0.042	0.344	0.032	0.379	0.018	0.449
	4	0.071	0.401	0.057	0.437	0.036	0.507
	5	0.104	0.456	0.087	0.491	0.058	0.560
	6	0.140	0.508	0.119	0.543	0.085	0.610
	7	0.177	0.558	0.154	0.592	0.114	0.657
	8	0.217	0.606	0.191	0.639	0.146	0.701
	9	0.259	0.653	0.231	0.685	0.181	0.743
	10	0.302	0.698	0.272	0.728	0.218	0.782
	11	0.347	0.741	0.315	0.769	0.257	0.819
	12	0.394	0.783	0.361	0.809	0.299	0.854
	13	0.442	0.823	0.408	0.846	0.343	0.886
	14	0.492	0.860	0.457	0.881	0.390	0.915
	15	0.544	0.896	0.509	0.913	0.440	0.942
	16	0.599	0.929	0.563	0.943	0.493	0.964
	17	0.656	0.958	0.621	0.968	0.551	0.982
	18	0.717	0.982	0.683	0.988	0.613	0.995
	19	0.784	0.997	0.751	0.999	0.683	1.000
	20	0.861	1.000	0.832	1.000	0.767	1.000

TABLE A4 (Continued)

n	Y	90%		95%		99%	
		Lower	Upper	Lower	Upper	Lower	Upper
23	21	0.802	0.998	0.772	0.999	0.708	1.000
	22	0.873	1.000	0.846	1.000	0.786	1.000
	0	0.000	0.122	0.000	0.148	0.000	0.206
	1	0.002	0.190	0.001	0.219	0.000	0.281
	2	0.016	0.249	0.011	0.280	0.005	0.345
	3	0.037	0.304	0.028	0.336	0.015	0.401
	4	0.062	0.355	0.050	0.388	0.031	0.453
	5	0.090	0.404	0.075	0.437	0.050	0.502
	6	0.120	0.451	0.102	0.484	0.073	0.548
	7	0.152	0.496	0.132	0.529	0.097	0.592
	8	0.186	0.540	0.164	0.573	0.125	0.634
	9	0.222	0.583	0.197	0.615	0.154	0.674
	10	0.258	0.625	0.232	0.655	0.185	0.712
	11	0.296	0.665	0.268	0.694	0.218	0.748
	12	0.335	0.704	0.306	0.732	0.252	0.782
	13	0.375	0.742	0.345	0.768	0.288	0.815
	14	0.417	0.778	0.385	0.803	0.326	0.846
	15	0.460	0.814	0.427	0.836	0.366	0.875
	16	0.504	0.848	0.471	0.868	0.408	0.903
24	17	0.549	0.880	0.516	0.898	0.452	0.927
	18	0.596	0.910	0.563	0.925	0.498	0.950
	19	0.645	0.938	0.612	0.950	0.547	0.969
	20	0.696	0.963	0.664	0.972	0.599	0.985
	21	0.751	0.984	0.720	0.989	0.655	0.995
	22	0.810	0.998	0.781	0.999	0.719	1.000
	23	0.878	1.000	0.852	1.000	0.794	1.000
	0	0.000	0.117	0.000	0.142	0.000	0.198
	1	0.002	0.183	0.001	0.211	0.000	0.271
	2	0.015	0.240	0.010	0.270	0.004	0.332
	3	0.035	0.292	0.027	0.324	0.015	0.387
	4	0.059	0.342	0.047	0.374	0.029	0.438
	5	0.086	0.389	0.071	0.422	0.048	0.485
	6	0.115	0.435	0.098	0.467	0.069	0.530
	7	0.146	0.479	0.126	0.511	0.093	0.573
	8	0.178	0.521	0.156	0.553	0.119	0.614
	9	0.212	0.563	0.188	0.594	0.146	0.653
	10	0.246	0.603	0.221	0.634	0.176	0.690
	11	0.282	0.642	0.256	0.672	0.207	0.726
	12	0.319	0.681	0.291	0.709	0.240	0.760
	13	0.358	0.718	0.328	0.744	0.274	0.793
25	14	0.397	0.754	0.366	0.779	0.310	0.824
	15	0.437	0.788	0.406	0.812	0.347	0.854
	16	0.479	0.822	0.447	0.844	0.386	0.881
	17	0.521	0.854	0.489	0.874	0.427	0.907
	18	0.565	0.885	0.533	0.902	0.470	0.931
	19	0.611	0.914	0.578	0.929	0.515	0.952
	0	0.000	0.122	0.000	0.148	0.000	0.206
	1	0.002	0.190	0.001	0.219	0.000	0.281
	2	0.016	0.249	0.011	0.280	0.005	0.345
	3	0.037	0.304	0.028	0.336	0.015	0.401
	4	0.062	0.355	0.050	0.388	0.031	0.453
	5	0.090	0.404	0.075	0.437	0.050	0.502
	6	0.120	0.451	0.102	0.484	0.073	0.548
	7	0.152	0.496	0.132	0.529	0.097	0.592
	8	0.186	0.540	0.164	0.573	0.125	0.634
	9	0.222	0.583	0.197	0.615	0.154	0.674
	10	0.258	0.625	0.232	0.655	0.185	0.712
	11	0.296	0.665	0.268	0.694	0.218	0.748
	12	0.335	0.704	0.306	0.732	0.252	0.782
	13	0.375	0.742	0.345	0.768	0.288	0.815
26	14	0.417	0.778	0.385	0.803	0.326	0.846
	15	0.460	0.814	0.427	0.836	0.366	0.875
	16	0.504	0.848	0.471	0.868	0.408	0.903
	17	0.549	0.880	0.516	0.898	0.452	0.927
	18	0.596	0.910	0.563	0.925	0.498	0.950
	19	0.645	0.938	0.612	0.950	0.547	0.969
	20	0.696	0.963	0.664	0.972	0.599	0.985
	21	0.751	0.984	0.720	0.989	0.655	0.995
	22	0.810	0.998	0.781	0.999	0.719	1.000
	23	0.878	1.000	0.852	1.000	0.794	1.000
	0	0.000	0.117	0.000	0.142	0.000	0.198
	1	0.002	0.183	0.001	0.211	0.000	0.271
	2	0.015	0.240	0.010	0.270	0.004	0.332
	3	0.035	0.292	0.027	0.324	0.015	0.387
	4	0.059	0.342	0.047	0.374	0.029	0.438
	5	0.086	0.389	0.071	0.422	0.048	0.485
	6	0.115	0.435	0.098	0.467	0.069	0.530
	7	0.146	0.479	0.126	0.511	0.093	0.573
	8	0.178	0.521	0.156	0.553	0.119	0.614
	9	0.212	0.563	0.188	0.594	0.146	0.653
	10	0.246	0.603	0.221	0.634	0.176	0.690
	11	0.282	0.642	0.256	0.672	0.207	0.726
	12	0.319	0.681	0.291	0.709	0.240	0.760
	13	0.358	0.718	0.328	0.744	0.274	0.793
	14	0.397	0.754	0.366	0.779	0.310	0.824
	15	0.437	0.788	0.406	0.812	0.347	0.854
	16	0.479	0.822	0.447	0.844	0.386	0.881
	17	0.521	0.854	0.489	0.874	0.427	0.907
	18	0.565	0.885	0.533	0.902	0.470	0.931
	19	0.611	0.914	0.578	0.929	0.515	0.952

TABLE A4 (Continued)

n	Y	90%		95%		99%	
		Lower	Upper	Lower	Upper	Lower	Upper
20	20	0.658	0.941	0.626	0.953	0.562	0.971
	21	0.708	0.965	0.676	0.973	0.613	0.985
	22	0.760	0.985	0.730	0.990	0.668	0.996
	23	0.817	0.998	0.789	0.999	0.729	1.000
	24	0.883	1.000	0.858	1.000	0.802	1.000
25	0	0.000	0.113	0.000	0.137	0.000	0.191
	1	0.002	0.176	0.001	0.204	0.000	0.262
	2	0.014	0.231	0.010	0.260	0.004	0.321
	3	0.034	0.282	0.025	0.312	0.014	0.374
	4	0.057	0.330	0.045	0.361	0.028	0.424
	5	0.082	0.375	0.068	0.407	0.046	0.470
	6	0.110	0.420	0.094	0.451	0.066	0.514
	7	0.139	0.462	0.121	0.494	0.089	0.555
	8	0.170	0.504	0.150	0.535	0.114	0.595
	9	0.202	0.544	0.180	0.575	0.140	0.634
	10	0.236	0.583	0.211	0.613	0.168	0.670
	11	0.270	0.621	0.244	0.651	0.197	0.705
	12	0.305	0.659	0.278	0.687	0.228	0.739
	13	0.341	0.695	0.313	0.722	0.261	0.772
	14	0.379	0.730	0.349	0.756	0.295	0.803
	15	0.417	0.764	0.387	0.789	0.330	0.832
	16	0.456	0.798	0.425	0.820	0.366	0.860
	17	0.496	0.830	0.465	0.850	0.405	0.886
	18	0.538	0.861	0.506	0.879	0.445	0.911
	19	0.580	0.890	0.549	0.906	0.486	0.934
26	20	0.625	0.918	0.593	0.932	0.530	0.954
	21	0.670	0.943	0.639	0.955	0.576	0.972
	22	0.718	0.966	0.688	0.975	0.626	0.986
	23	0.769	0.986	0.740	0.990	0.679	0.996
	24	0.824	0.998	0.796	0.999	0.738	1.000
	25	0.887	1.000	0.863	1.000	0.809	1.000
	0	0.000	0.109	0.000	0.132	0.000	0.184
	1	0.002	0.170	0.001	0.196	0.000	0.253
	2	0.014	0.223	0.009	0.251	0.004	0.310
	3	0.032	0.272	0.024	0.302	0.013	0.362
	4	0.054	0.318	0.044	0.349	0.027	0.410
	5	0.079	0.363	0.066	0.393	0.044	0.455
	6	0.106	0.405	0.090	0.436	0.064	0.498
	7	0.134	0.447	0.116	0.478	0.085	0.538
	8	0.163	0.487	0.143	0.518	0.109	0.578
	9	0.194	0.526	0.172	0.557	0.134	0.615
	10	0.226	0.564	0.202	0.594	0.161	0.651
	11	0.258	0.602	0.234	0.631	0.189	0.686
	12	0.292	0.638	0.266	0.666	0.218	0.719
	13	0.327	0.673	0.299	0.701	0.249	0.751
	14	0.362	0.708	0.334	0.734	0.281	0.782

TABLE A4 (Continued)

n	Y	90%		95%		99%	
		Lower	Upper	Lower	Upper	Lower	Upper
27	15	0.398	0.742	0.369	0.766	0.314	0.811
	16	0.436	0.774	0.406	0.798	0.349	0.839
	17	0.474	0.806	0.443	0.828	0.385	0.866
	18	0.513	0.837	0.482	0.857	0.422	0.891
	19	0.553	0.866	0.522	0.884	0.462	0.915
	20	0.595	0.894	0.564	0.910	0.502	0.936
	21	0.637	0.921	0.607	0.934	0.545	0.956
	22	0.682	0.946	0.651	0.956	0.590	0.973
	23	0.728	0.968	0.698	0.976	0.638	0.987
	24	0.777	0.986	0.749	0.991	0.690	0.996
	25	0.830	0.998	0.804	0.999	0.747	1.000
	26	0.891	1.000	0.868	1.000	0.816	1.000
	0	0.000	0.105	0.000	0.128	0.000	0.178
	1	0.002	0.164	0.001	0.190	0.000	0.245
	2	0.013	0.215	0.009	0.243	0.004	0.300
	3	0.031	0.263	0.024	0.292	0.013	0.351
	4	0.052	0.308	0.042	0.337	0.026	0.401
28	5	0.076	0.351	0.063	0.381	0.042	0.441
	6	0.101	0.392	0.086	0.423	0.061	0.483
	7	0.129	0.432	0.111	0.463	0.082	0.523
	8	0.157	0.471	0.138	0.502	0.104	0.561
	9	0.186	0.509	0.165	0.540	0.128	0.597
	10	0.217	0.547	0.194	0.576	0.154	0.633
	11	0.248	0.583	0.224	0.612	0.181	0.667
	12	0.280	0.618	0.255	0.647	0.209	0.700
	13	0.313	0.653	0.287	0.681	0.238	0.731
	14	0.347	0.687	0.319	0.713	0.269	0.762
	15	0.382	0.720	0.353	0.745	0.300	0.791
	16	0.417	0.752	0.388	0.776	0.333	0.819
	17	0.453	0.783	0.424	0.806	0.367	0.846
	18	0.491	0.814	0.460	0.835	0.403	0.872
	19	0.529	0.843	0.498	0.862	0.439	0.896
	20	0.568	0.871	0.537	0.889	0.477	0.918
29	21	0.608	0.899	0.577	0.914	0.517	0.939
	22	0.649	0.924	0.619	0.937	0.559	0.958
	23	0.692	0.948	0.663	0.958	0.603	0.974
	24	0.737	0.969	0.708	0.976	0.649	0.987
	25	0.785	0.987	0.757	0.991	0.700	0.996
	26	0.836	0.998	0.810	0.999	0.755	1.000
	27	0.895	1.000	0.872	1.000	0.822	1.000
	0	0.000	0.101	0.000	0.123	0.000	0.172
	1	0.002	0.159	0.001	0.183	0.000	0.237
	2	0.013	0.208	0.009	0.235	0.004	0.291
	3	0.030	0.254	0.023	0.282	0.012	0.340
	4	0.050	0.298	0.040	0.327	0.025	0.385

TABLE A4 (Continued)

n	Y	98%		95%		99%	
		Lower	Upper	Lower	Upper	Lower	Upper
29	5	0.073	0.339	0.061	0.369	0.041	0.428
	6	0.098	0.380	0.083	0.410	0.059	0.469
	7	0.124	0.419	0.107	0.449	0.079	0.508
	8	0.151	0.457	0.132	0.487	0.100	0.545
	9	0.179	0.494	0.159	0.524	0.123	0.581
	10	0.208	0.530	0.186	0.559	0.148	0.615
	11	0.238	0.565	0.215	0.594	0.173	0.649
	12	0.269	0.600	0.245	0.628	0.200	0.681
	13	0.301	0.634	0.275	0.661	0.228	0.713
	14	0.333	0.667	0.306	0.694	0.257	0.743
	15	0.366	0.699	0.339	0.725	0.287	0.772
	16	0.400	0.731	0.372	0.755	0.319	0.800
	17	0.435	0.762	0.406	0.785	0.351	0.827
	18	0.470	0.792	0.441	0.814	0.385	0.852
	19	0.506	0.821	0.476	0.841	0.419	0.877
	20	0.543	0.849	0.513	0.868	0.455	0.900
	21	0.581	0.876	0.551	0.893	0.492	0.921
	22	0.620	0.902	0.590	0.917	0.531	0.941
	23	0.661	0.927	0.631	0.939	0.572	0.959
	24	0.702	0.950	0.673	0.960	0.615	0.975
	25	0.746	0.970	0.718	0.977	0.660	0.988
	26	0.792	0.987	0.765	0.991	0.709	0.996
	27	0.841	0.998	0.817	0.999	0.763	1.000
	28	0.899	1.000	0.877	1.000	0.828	1.000
	0	0.000	0.098	0.000	0.119	0.000	0.167
	1	0.002	0.153	0.001	0.178	0.000	0.230
	2	0.012	0.202	0.008	0.228	0.004	0.282
	3	0.029	0.246	0.022	0.274	0.012	0.330
	4	0.049	0.288	0.039	0.317	0.024	0.374
	5	0.070	0.329	0.058	0.358	0.039	0.416
	6	0.094	0.368	0.080	0.397	0.056	0.455
	7	0.119	0.406	0.103	0.435	0.076	0.493
	8	0.145	0.443	0.127	0.472	0.096	0.530
	9	0.172	0.479	0.153	0.508	0.119	0.565
	10	0.201	0.514	0.179	0.543	0.142	0.599
	11	0.229	0.549	0.207	0.577	0.167	0.632
	12	0.259	0.583	0.235	0.611	0.192	0.664
	13	0.289	0.616	0.264	0.643	0.219	0.695
	14	0.320	0.648	0.294	0.675	0.247	0.724
	15	0.352	0.680	0.325	0.706	0.276	0.753
	16	0.384	0.711	0.357	0.736	0.305	0.781
	17	0.417	0.741	0.389	0.765	0.336	0.808
	18	0.451	0.771	0.423	0.793	0.368	0.833
	19	0.486	0.799	0.457	0.821	0.401	0.858
	20	0.521	0.828	0.492	0.847	0.435	0.881
	21	0.557	0.855	0.528	0.873	0.470	0.904

TABLE A4 (Continued)

n	Y	90%		95%		99%	
		Lower	Upper	Lower	Upper	Lower	Upper
22		0.594	0.881	0.565	0.897	0.507	0.924
23		0.632	0.906	0.603	0.920	0.545	0.944
24		0.671	0.930	0.642	0.942	0.584	0.961
25		0.712	0.951	0.683	0.961	0.626	0.976
26		0.754	0.971	0.726	0.978	0.670	0.988
27		0.798	0.988	0.772	0.992	0.718	0.996
28		0.847	0.998	0.822	0.999	0.770	1.000
29		0.902	1.000	0.881	1.000	0.833	1.000
30	0	0.000	0.095	0.000	0.116	0.000	0.162
	1	0.002	0.149	0.001	0.172	0.000	0.223
	2	0.012	0.195	0.008	0.221	0.004	0.274
	3	0.028	0.239	0.021	0.265	0.012	0.320
	4	0.047	0.280	0.038	0.307	0.023	0.363
	5	0.068	0.319	0.056	0.347	0.038	0.404
	6	0.091	0.357	0.077	0.386	0.054	0.443
	7	0.115	0.394	0.099	0.423	0.073	0.480
	8	0.140	0.430	0.123	0.459	0.093	0.516
	9	0.166	0.465	0.147	0.494	0.114	0.550
	10	0.193	0.499	0.173	0.528	0.137	0.583
	11	0.221	0.533	0.199	0.561	0.160	0.616
	12	0.250	0.566	0.227	0.594	0.185	0.647
	13	0.279	0.598	0.255	0.626	0.211	0.677
	14	0.308	0.630	0.283	0.657	0.237	0.707
	15	0.339	0.661	0.313	0.687	0.265	0.735
	16	0.370	0.692	0.343	0.717	0.293	0.763
	17	0.402	0.721	0.374	0.745	0.323	0.789
	18	0.434	0.750	0.406	0.773	0.353	0.815
	19	0.467	0.779	0.439	0.801	0.384	0.840
	20	0.501	0.807	0.472	0.827	0.417	0.863
	21	0.535	0.834	0.506	0.853	0.450	0.886
	22	0.570	0.860	0.541	0.877	0.484	0.907
	23	0.606	0.885	0.577	0.901	0.520	0.927
	24	0.643	0.909	0.614	0.923	0.557	0.946
	25	0.681	0.932	0.653	0.944	0.596	0.962
	26	0.720	0.953	0.693	0.962	0.637	0.977
	27	0.761	0.972	0.735	0.979	0.680	0.988
	28	0.805	0.988	0.779	0.992	0.726	0.996
	29	0.851	0.998	0.828	0.999	0.777	1.000
	30	0.905	1.000	0.884	1.000	0.838	1.000

SOURCE: Generated by R. L. Iman. Used with permission.

TABLE A5 Sample Sizes for Nonparametric Tolerance Limits When $r + m = 1^*$

$1 - \alpha$	$q = 0.500$	0.700	0.750	0.800	0.850	0.900	0.950	0.975	0.980	0.990
0.500	1	2	3	4	5	7	14	28	35	69
0.700	2	4	5	6	8	12	24	48	60	120
0.750	2	4	5	7	9	14	28	55	69	138
0.800	3	5	6	8	10	16	32	64	80	161
0.850	3	6	7	9	12	19	37	75	94	189
0.900	4	7	9	11	15	22	45	91	144	230
0.950	5	9	11	14	19	29	59	119	149	299
0.975	6	11	13	17	23	36	72	146	183	368
0.980	6	11	14	18	25	38	77	155	194	390
0.990	7	13	17	21	29	44	90	182	228	459
0.995	8	15	19	24	33	51	104	210	263	528
0.999	10	20	25	31	43	66	135	273	342	688

* The quantity tabled is the sample size n such that $q^* \leq \alpha$ for use in finding the tolerance limits

$P(X^{(n)} \leq p \text{ of the population}) \geq 1 - \alpha$

or

$P(q \text{ of the population} \leq X^{(n)}) \geq 1 - \alpha$

as described in Section 3.3.

TABLE A6 Sample Sizes for Nonparametric Tolerance Limits When $r + m = 2^*$

$1 - \alpha$	$q = 0.500$	0.700	0.750	0.800	0.850	0.900	0.950	0.975	0.980	0.990
0.500	3	6	7	9	11	17	34	67	84	168
0.700	5	8	10	12	16	24	49	97	122	244
0.750	5	9	10	13	18	27	53	107	134	269
0.800	5	9	11	14	19	29	59	119	149	299
0.850	6	10	13	16	22	33	67	134	168	337
0.900	7	12	15	18	25	38	77	155	194	388
0.950	8	14	18	22	30	46	93	188	236	473
0.975	9	17	20	26	35	54	110	221	277	555
0.980	9	17	21	27	37	56	115	231	290	581
0.990	11	20	24	31	42	64	130	263	330	662
0.995	12	22	27	34	47	72	146	294	369	740
0.999	14	27	33	42	58	89	181	366	458	920

* The quantity tabled is the sample size n such that $q^* + nq^{1-\alpha} \leq \alpha$ for use in finding the tolerance limits

$P(X^{(n)} \leq q \text{ of the population} \leq X^{(n+1-n)}) \geq 1 - \alpha$

when $r + m = 2$.

20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
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TABLE A7 (Continued)												
<i>n</i>	<i>p</i>	<i>m</i> = 2	3	4	5	6	7	8	9	10	11	12
0.001	45	45	45	45	47	48	49	51	53	54	56	60
0.005	45	45	46	47	49	51	53	55	57	62	64	66
0.01	45	45	46	47	49	51	53	55	57	62	64	66
0.025	46	48	50	53	55	58	61	64	67	72	74	76
0.05	47	50	52	55	58	61	64	67	70	73	76	78
0.10	48	51	53	55	58	61	64	67	70	73	76	78
0.001	55	55	56	57	59	62	64	66	68	71	74	77
0.005	55	55	56	57	59	62	64	66	68	71	74	77
0.01	55	55	56	57	59	62	64	66	68	71	74	77
0.025	56	59	61	64	67	70	73	76	79	82	85	88
0.05	57	60	63	66	69	72	75	78	80	83	86	89
0.10	59	62	65	68	71	74	77	80	82	84	86	88
0.001	66	66	67	69	71	73	75	77	79	82	84	86
0.005	66	66	67	69	71	73	75	77	79	82	84	86
0.01	66	66	67	69	71	73	75	77	79	82	84	86
0.025	67	68	69	71	73	75	77	79	81	83	85	87
0.05	68	69	70	71	73	75	77	79	81	83	85	87
0.10	70	71	72	73	74	75	76	77	78	79	80	81
0.001	78	78	79	81	81	83	84	86	88	90	91	93
0.005	78	78	79	81	81	83	84	86	88	90	91	93
0.01	78	78	79	81	81	83	84	86	88	90	91	93
0.025	80	80	82	85	85	88	89	91	93	94	96	98
0.05	80	80	82	85	85	88	89	91	93	94	96	98
0.10	81	81	84	86	86	89	90	92	94	95	97	99
0.001	83	83	86	88	88	90	92	94	96	98	100	101
0.005	83	83	86	88	88	90	92	94	96	98	100	101
0.01	83	83	86	88	88	90	92	94	96	98	100	101
0.025	84	84	87	89	89	91	93	95	97	99	101	103
0.05	84	84	87	89	89	91	93	95	97	99	101	103
0.10	85	85	88	90	90	92	94	96	98	100	102	104
0.001	86	86	89	91	91	93	95	97	99	101	103	105
0.005	86	86	89	91	91	93	95	97	99	101	103	105
0.01	86	86	89	91	91	93	95	97	99	101	103	105
0.025	87	87	90	92	92	94	96	98	100	102	104	106
0.05	87	87	90	92	92	94	96	98	100	102	104	106
0.10	88	88	91	93	93	95	97	99	101	103	105	107
0.001	89	89	91	93	94	96	98	100	102	104	106	108
0.005	89	89	91	93	94	96	98	100	102	104	106	108
0.01	89	89	91	93	94	96	98	100	102	104	106	108
0.025	90	92	94	96	98	100	102	104	106	108	110	112
0.05	90	92	94	96	98	100	102	104	106	108	110	112
0.10	91	93	95	97	99	101	103	105	107	109	111	113
0.001	93	95	97	99	101	103	105	107	109	111	113	115
0.005	93	95	97	99	101	103	105	107	109	111	113	115
0.01	93	95	97	99	101	103	105	107	109	111	113	115
0.025	94	96	98	100	102	104	106	108	110	112	114	116
0.05	94	96	98	100	102	104	106	108	110	112	114	116
0.10	95	97	99	101	103	105	107	109	111	113	115	117
0.001	96	98	100	102	104	106	108	110	112	114	116	118
0.005	96	98	100	102	104	106	108	110	112	114	116	118
0.01	96	98	100	102	104	106	108	110	112	114	116	118
0.025	97	99	101	103	105	107	109	111	113	115	117	119
0.05	97	99	101	103	105	107	109	111	113	115	117	119
0.10	98	100	102	104	106	108	110	112	114	116	118	120
0.001	100	100	100	100	100	100	100	100	100	100	100	100
0.005	100	100	100	100	100	100	100	100	100	100	100	100
0.01	100	100	100	100	100	100	100	100	100	100	100	100
0.025	100	100	100	100	100	100	100	100	100	100	100	100
0.05	100	100	100	100	100	100	100	100	100	100	100	100
0.10	100	100	100	100	100	100	100	100	100	100	100	100

n	p	$m=2$	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
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[illegible]

TABLE A9 Quantiles of the Squared Ranks Test Statistic*

n	p	m = 3	4	5	6	7	8	9	10
3	0.005	14	14	14	14	14	14	21	21
	0.01	14	14	14	14	14	21	26	26
	0.025	14	14	21	26	29	30	35	41
	0.05	21	21	26	30	38	42	49	54
	0.10	26	29	35	42	50	59	69	77
	0.90	65	90	117	149	182	221	260	305
	0.95	70	101	129	161	197	238	285	333
	0.975	77	110	138	170	213	257	308	362
	0.99	77	110	149	194	230	285	329	394
	0.995	77	110	149	194	245	302	346	413
4	0.005	30	30	30	30	39	46	50	54
	0.01	30	30	39	46	50	51	62	66
	0.025	30	39	50	54	63	71	78	90
	0.05	39	50	57	66	78	90	102	114
	0.10	50	62	71	85	99	114	130	149
	0.90	111	142	182	222	270	321	375	435
	0.95	119	154	197	246	294	350	413	476
	0.975	126	165	206	255	311	374	439	510
	0.99	126	174	219	270	334	401	470	545
	0.995	126	174	230	281	351	414	494	567
5	0.005	55	55	66	75	79	88	99	110
	0.01	55	66	75	82	90	103	115	127
	0.025	66	79	88	100	114	130	145	162
	0.05	75	88	103	120	135	155	175	195
	0.10	87	103	121	142	163	187	212	239
	0.90	169	214	264	319	379	445	514	591
	0.95	178	228	282	342	410	479	558	639
	0.975	183	235	297	363	433	508	592	680
	0.99	190	246	310	382	459	543	631	727
	0.995	190	255	319	391	478	559	654	754
6	0.005	91	104	115	124	136	152	167	182
	0.01	91	115	124	139	155	175	191	210
	0.025	115	130	143	164	184	208	231	255
	0.05	124	139	164	187	211	239	268	299
	0.10	136	163	187	215	247	280	315	352
	0.90	243	300	364	435	511	592	679	772
	0.95	255	319	386	463	545	634	730	831
	0.975	259	331	406	486	574	670	771	880
	0.99	271	339	424	511	607	706	817	935
	0.995	271	346	431	526	624	731	847	970

SOURCE: Adapted from tables generated by R.L. Iman. Used with permission.
* The entries in this table are selected quantiles w_p of the squared ranks test statistic T , given by Equation 5.3.3. Note that $P(T < w_p) \leq p$ and $P(T > w_p) \leq 1 - p$. Critical regions correspond to values less than (or greater than) but not including the appropriate quantile.

TABLE A9 (Continued)

n	p	m = 3	4	5	6	7	8	9	10
7	0.005	140	155	172	195	212	235	257	280
	0.01	155	172	195	217	236	260	287	315
	0.025	172	195	217	245	274	305	338	372
	0.05	188	212	240	274	308	344	384	425
	0.10	203	236	271	308	350	394	440	489
	0.90	335	407	487	572	665	764	871	984
	0.95	347	428	515	608	707	814	929	1051
	0.975	356	443	536	635	741	856	979	1108
	0.99	364	456	560	664	779	900	1032	1172
	0.995	371	467	571	683	803	929	1067	1212
8	0.005	204	236	260	284	311	340	368	401
	0.01	221	249	276	309	340	372	408	445
	0.025	249	276	311	345	384	425	468	513
	0.05	268	300	340	381	426	473	524	576
	0.10	285	329	374	423	476	531	590	652
	0.90	447	536	632	735	846	965	1091	1224
	0.95	464	560	664	776	896	1023	1159	1303
	0.975	476	579	689	807	935	1071	1215	1368
	0.99	485	599	716	840	980	1124	1277	1442
	0.995	492	604	731	863	1005	1156	1319	1489
9	0.005	304	325	361	393	429	466	508	549
	0.01	321	349	384	423	464	508	553	601
	0.025	342	380	423	469	517	570	624	682
	0.05	365	406	457	510	567	626	689	755
	0.10	390	444	501	561	625	694	766	843
	0.90	581	689	803	925	1056	1195	1343	1498
	0.95	601	717	840	972	1112	1261	1420	1587
	0.975	615	741	870	1009	1158	1317	1485	1662
	0.99	624	757	900	1049	1209	1377	1556	1745
	0.995	629	769	916	1073	1239	1417	1601	1798
10	0.005	406	448	486	526	573	620	672	725
	0.01	425	470	513	561	613	667	725	785
	0.025	457	505	560	616	677	741	808	879
	0.05	486	539	601	665	734	806	883	963
	0.10	514	580	649	724	801	885	972	1064
	0.90	742	866	1001	1144	1296	1457	1627	1806
	0.95	765	901	1045	1197	1360	1533	1715	1907
	0.975	778	925	1078	1241	1413	1596	1788	1991
	0.99	793	949	1113	1286	1470	1664	1869	2085
	0.995	798	961	1130	1314	1505	1708	1921	2145

For n or m greater than 10, the p th quantile w_p of the squared ranks test statistic may be approximated by

$$w_p = \frac{n(N+1)(2N+1)}{6} + z_p \sqrt{\frac{nm(N+1)(2N+1)(8N+1)}{180}}$$

where $N = n + m$, and where z_p is the p th quantile of a standard normal random variable, obtained from Table A1.

TABLE A10 Quantiles of Spearman's ρ^r

n	p = 0.900	0.950	0.975	0.990	0.995	0.999
4	0.8000	0.8000	0.9000	0.9000		
5	0.7000	0.8000	0.8286	0.8857	0.9429	0.9643
6	0.6000	0.7714	0.8286	0.8857	0.8929	0.9286
7	0.5357	0.6786	0.7500	0.8571	0.8571	0.9000
8	0.5000	0.6190	0.7143	0.8095	0.8167	0.8667
9	0.4667	0.5833	0.6833	0.7667	0.7818	0.8364
10	0.4424	0.5515	0.6364	0.7333	0.7455	0.8112
11	0.4182	0.5273	0.6091	0.7000	0.7203	0.7857
12	0.3986	0.4965	0.5804	0.6713	0.6978	0.7670
13	0.3791	0.4780	0.5549	0.6429	0.6747	0.7464
14	0.3626	0.4593	0.5341	0.6220	0.6500	0.7265
15	0.3500	0.4429	0.5179	0.6000	0.6324	0.7083
16	0.3382	0.4265	0.5000	0.5794	0.6152	0.6904
17	0.3260	0.4118	0.4853	0.5637	0.5975	0.6737
18	0.3148	0.3994	0.4696	0.5480	0.5825	0.6586
19	0.3070	0.3895	0.4579	0.5333	0.5684	0.6455
20	0.2977	0.3789	0.4451	0.5203	0.5545	0.6318
21	0.2909	0.3688	0.4351	0.5078	0.5426	0.6186
22	0.2829	0.3597	0.4241	0.4963	0.5306	0.6070
23	0.2767	0.3518	0.4150	0.4852	0.5200	0.5962
24	0.2704	0.3435	0.4061	0.4748	0.5100	0.5856
25	0.2646	0.3362	0.3977	0.4654	0.5002	0.5757
26	0.2588	0.3299	0.3894	0.4564	0.4915	0.5660
27	0.2540	0.3236	0.3822	0.4481	0.4828	0.5567
28	0.2490	0.3175	0.3749	0.4401	0.4744	0.5479
29	0.2443	0.3113	0.3685	0.4320	0.4665	
30	0.2400	0.3059	0.3620	0.4251		

For n greater than 30 the approximate quantiles of ρ may be obtained from

$$w_p = \frac{z_p}{\sqrt{n-1}}$$

where z_p is the pth quantile of a standard normal random variable obtained from Table A1.

SOURCE: Adapted from Glasser and Winter (1961), with corrections, with permission from the Biometrika Trustees.

* The entries in this table are selected quantiles w_p of the Spearman rank correlation coefficient ρ when used as a test statistic. The lower quantiles may be obtained from the equation

$$w_p = -w_{1-p}$$

The critical region corresponds to values of ρ smaller than (or greater than) but not including the appropriate quantile. Note that the median of ρ is 0.

TABLE A11 Quantiles of the Kendall test statistic $T = N_c - N_d$. Quantiles of Kendall's τ are given in parentheses. Lower quantiles are the negative of the upper quantiles, $w_p = -w_{1-p}$.

n	p = 0.900	0.950	0.975	0.990	0.995
4	4 (0.6667)	4 (0.6667)	6 (1.0000)	6 (1.0000)	6 (1.0000)
5	6 (0.6000)	6 (0.6000)	8 (0.8000)	8 (0.8000)	10 (1.0000)
6	7 (0.4667)	9 (0.6000)	11 (0.7333)	11 (0.7333)	13 (0.8667)
7	9 (0.4286)	11 (0.5238)	13 (0.6190)	15 (0.7143)	17 (0.8095)
8	10 (0.3571)	14 (0.5000)	16 (0.5714)	18 (0.6429)	20 (0.7143)
9	12 (0.3333)	16 (0.4444)	18 (0.5000)	22 (0.6111)	24 (0.6667)
10	15 (0.3333)	19 (0.4222)	21 (0.4667)	25 (0.5556)	27 (0.6000)
11	17 (0.3091)	21 (0.3818)	25 (0.4545)	29 (0.5273)	31 (0.5636)
12	18 (0.2727)	24 (0.3636)	28 (0.4242)	34 (0.5152)	36 (0.5455)
13	22 (0.2821)	26 (0.3333)	32 (0.4103)	38 (0.4872)	42 (0.5285)
14	23 (0.2527)	31 (0.3407)	35 (0.3846)	41 (0.4505)	45 (0.4945)
15	27 (0.2571)	33 (0.3143)	39 (0.3714)	47 (0.4476)	51 (0.4857)
16	28 (0.2333)	36 (0.3000)	44 (0.3667)	50 (0.4167)	56 (0.4667)
17	32 (0.2353)	40 (0.2941)	48 (0.3529)	56 (0.4118)	62 (0.4559)
18	35 (0.2288)	43 (0.2810)	51 (0.3333)	61 (0.3987)	67 (0.4379)
19	37 (0.2164)	47 (0.2749)	55 (0.3216)	65 (0.3801)	73 (0.4269)
20	40 (0.2105)	50 (0.2632)	60 (0.3158)	70 (0.3684)	78 (0.4105)
21	42 (0.2000)	54 (0.2571)	64 (0.3048)	76 (0.3619)	84 (0.4000)
22	45 (0.1948)	59 (0.2554)	69 (0.2987)	81 (0.3506)	89 (0.3853)
23	49 (0.1937)	63 (0.2490)	73 (0.2885)	87 (0.3439)	97 (0.3834)
24	52 (0.1894)	66 (0.2391)	78 (0.2826)	92 (0.3333)	102 (0.3696)
25	56 (0.1867)	70 (0.2333)	84 (0.2800)	98 (0.3267)	108 (0.3600)
26	59 (0.1815)	75 (0.2308)	89 (0.2738)	105 (0.3231)	115 (0.3538)
27	61 (0.1738)	79 (0.2251)	93 (0.2650)	111 (0.3162)	123 (0.3504)
28	66 (0.1746)	84 (0.2222)	98 (0.2593)	116 (0.3069)	128 (0.3386)
29	68 (0.1675)	88 (0.2167)	104 (0.2562)	124 (0.3054)	136 (0.3350)
30	73 (0.1678)	93 (0.2138)	109 (0.2506)	129 (0.2966)	143 (0.3287)
31	75 (0.1613)	97 (0.2086)	115 (0.2473)	135 (0.2903)	149 (0.3204)
32	80 (0.1613)	102 (0.2056)	120 (0.2419)	142 (0.2863)	158 (0.3185)
33	84 (0.1591)	106 (0.2008)	126 (0.2386)	150 (0.2841)	164 (0.3106)
34	87 (0.1551)	111 (0.1979)	131 (0.2335)	155 (0.2763)	173 (0.3084)
35	91 (0.1529)	115 (0.1933)	137 (0.2303)	163 (0.2739)	179 (0.3008)
36	94 (0.1492)	120 (0.1905)	144 (0.2286)	170 (0.2698)	188 (0.2984)
37	98 (0.1471)	126 (0.1892)	150 (0.2252)	176 (0.2643)	198 (0.2943)

TABLE A14 Quantiles of the Lilliefors Test Statistic for Normality*

Sample size n	p				
	0.80	0.85	0.90	0.95	0.99
4	0.303	0.320	0.344	0.374	0.414
5	0.290	0.302	0.319	0.344	0.398
6	0.268	0.280	0.295	0.321	0.371
7	0.252	0.264	0.280	0.304	0.353
8	0.239	0.251	0.266	0.290	0.333
9	0.227	0.239	0.253	0.275	0.319
10	0.217	0.228	0.241	0.262	0.303
11	0.209	0.219	0.232	0.252	0.291
12	0.201	0.210	0.223	0.243	0.281
13	0.193	0.203	0.215	0.233	0.270
14	0.187	0.196	0.209	0.227	0.264
15	0.181	0.190	0.202	0.219	0.256
16	0.176	0.184	0.195	0.212	0.248
17	0.170	0.179	0.190	0.207	0.241
18	0.166	0.174	0.185	0.201	0.234
19	0.162	0.171	0.181	0.197	0.230
20	0.159	0.167	0.177	0.192	0.223
21	0.155	0.163	0.173	0.188	0.219
22	0.152	0.160	0.170	0.185	0.214
23	0.149	0.156	0.165	0.181	0.210
24	0.145	0.153	0.162	0.177	0.205
25	0.144	0.151	0.159	0.173	0.202
26	0.141	0.147	0.156	0.170	0.198
27	0.138	0.145	0.153	0.166	0.193
28	0.136	0.142	0.151	0.165	0.191
29	0.134	0.140	0.149	0.162	0.188
30	0.132	0.138	0.146	0.159	0.183
≥ 31	0.741	0.775	0.819	0.895	1.035

$d_n = (\sqrt{n} - 0.01 + 0.83/\sqrt{n})$

Source: Table L.5, Mason and Bell (1986). Used with permission from Marcel Dekker, Inc.
*The entries in this table are the approximate quantiles w_α of the Lilliefors test statistic T_1 as defined by Equation 6.2.4. Reject H_0 at the level α if T_1 exceeds $w_{1-\alpha}$ for the particular sample size n .

TABLE A15 Quantiles of the Lilliefors Test Statistic for the Exponential Distribution*

p	n									
	2	3	4	5	6	7	8	9	10	Approximation for $n > 100$
0.999	0.6317	0.6296	0.6215	0.5814	0.5497	0.5181	0.4913	0.3995	0.4679	0.6317
0.995	0.6384	0.6303	0.6003	0.5574	0.5296	0.5042	0.4808	0.4442	0.4940	0.6384
0.990	0.6433	0.5508	0.5080	0.4645	0.4320	0.4085	0.3813	0.3404	0.3995	0.6433
0.985	0.6594	0.5111	0.4508	0.4037	0.3732	0.3481	0.3274	0.3101	0.3404	0.6594
0.980	0.6773	0.4934	0.4266	0.3843	0.3520	0.3269	0.3062	0.2890	0.3101	0.6773
0.975	0.6977	0.4773	0.4087	0.3654	0.3331	0.3080	0.2873	0.2700	0.2890	0.6977
0.970	0.7243	0.4613	0.3927	0.3494	0.3171	0.2920	0.2713	0.2540	0.2730	0.7243
0.965	0.7573	0.4463	0.3777	0.3344	0.3021	0.2770	0.2563	0.2390	0.2580	0.7573
0.960	0.7957	0.4323	0.3627	0.3194	0.2871	0.2620	0.2413	0.2240	0.2430	0.7957
0.955	0.8397	0.4193	0.3497	0.3064	0.2741	0.2490	0.2283	0.2110	0.2300	0.8397
0.950	0.8898	0.4073	0.3377	0.2944	0.2621	0.2370	0.2163	0.2000	0.2190	0.8898
0.945	0.9469	0.3963	0.3267	0.2834	0.2511	0.2260	0.2053	0.1890	0.2080	0.9469
0.940	1.0114	0.3863	0.3167	0.2734	0.2411	0.2160	0.1953	0.1790	0.1980	1.0114
0.935	1.0827	0.3773	0.3077	0.2644	0.2321	0.2070	0.1863	0.1700	0.1890	1.0827
0.930	1.1616	0.3693	0.2997	0.2564	0.2241	0.1990	0.1783	0.1620	0.1810	1.1616
0.925	1.2491	0.3623	0.2927	0.2494	0.2171	0.1920	0.1713	0.1550	0.1740	1.2491
0.920	1.3469	0.3563	0.2867	0.2434	0.2111	0.1860	0.1653	0.1490	0.1680	1.3469
0.915	1.4573	0.3513	0.2817	0.2384	0.2061	0.1810	0.1603	0.1440	0.1630	1.4573
0.910	1.5827	0.3473	0.2777	0.2344	0.2021	0.1770	0.1563	0.1400	0.1590	1.5827
0.905	1.7243	0.3443	0.2747	0.2314	0.1991	0.1740	0.1533	0.1370	0.1560	1.7243
0.900	1.8827	0.3423	0.2727	0.2294	0.1971	0.1720	0.1513	0.1350	0.1540	1.8827
0.895	2.0597	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	2.0597
0.890	2.2691	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	2.2691
0.885	2.5114	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	2.5114
0.880	2.7869	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	2.7869
0.875	3.1073	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	3.1073
0.870	3.4743	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	3.4743
0.865	3.8973	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	3.8973
0.860	4.3827	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	4.3827
0.855	4.9469	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	4.9469
0.850	5.6001	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	5.6001
0.845	6.3617	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	6.3617
0.840	7.2469	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	7.2469
0.835	8.2743	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	8.2743
0.830	9.4691	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	9.4691
0.825	10.8469	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	10.8469
0.820	12.4327	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	12.4327
0.815	14.2469	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	14.2469
0.810	16.3001	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	16.3001
0.805	18.6273	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	18.6273
0.800	21.2469	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	21.2469
0.795	24.1827	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	24.1827
0.790	27.4691	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	27.4691
0.785	31.1469	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	31.1469
0.780	35.2469	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	35.2469
0.775	39.7827	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	39.7827
0.770	44.7827	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	44.7827
0.765	50.2827	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	50.2827
0.760	56.2827	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	56.2827
0.755	62.8827	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	62.8827
0.750	69.9827	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	69.9827
0.745	77.6827	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	77.6827
0.740	85.9827	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	85.9827
0.735	94.8827	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	94.8827
0.730	104.3827	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	104.3827
0.725	114.4827	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	114.4827
0.720	125.1827	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	125.1827
0.715	136.4827	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	136.4827
0.710	148.3827	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	148.3827
0.705	160.8827	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	160.8827
0.700	173.9827	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	173.9827
0.695	187.6827	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	187.6827
0.690	201.9827	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	201.9827
0.685	216.8827	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	216.8827
0.680	232.3827	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	232.3827
0.675	248.4827	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	248.4827
0.670	265.1827	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	265.1827
0.665	282.4827	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	282.4827
0.660	300.3827	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	300.3827
0.655	318.8827	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	318.8827
0.650	337.9827	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	337.9827
0.645	357.6827	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	357.6827
0.640	377.9827	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	377.9827
0.635	398.8827	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	398.8827
0.630	419.3827	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	419.3827
0.625	440.4827	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	440.4827
0.620	461.9827	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	461.9827
0.615	483.8827	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	483.8827
0.610	505.9827	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	505.9827
0.605	528.2827	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	528.2827
0.600	550.7827	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	550.7827
0.595	573.4827	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	573.4827
0.590	596.3827	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	596.3827
0.585	619.4827	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	619.4827
0.580	642.7827	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	642.7827
0.575	666.2827	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	666.2827
0.570	689.9827	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	689.9827
0.565	713.8827	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	713.8827
0.560	737.9827	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	737.9827
0.555	762.2827	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	762.2827
0.550	786.7827	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	786.7827
0.545	811.4827	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	811.4827
0.540	836.3827	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	836.3827
0.535	861.4827	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	861.4827
0.530	886.7827	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	886.7827
0.525	912.2827	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	912.2827
0.520	937.9827	0.3413	0.2717	0.2284	0.1961	0.1710	0.1503	0.1340	0.1530	937.9827
0.515	963.8827	0.3413								

TABLE A14 Quantiles of the Lilliefors Test Statistic for Normality*

Sample size n	$p =$					
	0.80	0.85	0.90	0.95	0.99	
4	0.303	0.320	0.344	0.374	0.414	d_n
5	0.290	0.302	0.319	0.344	0.398	
6	0.268	0.280	0.295	0.321	0.371	
7	0.252	0.264	0.280	0.304	0.353	
8	0.239	0.251	0.266	0.290	0.333	
9	0.227	0.239	0.253	0.275	0.319	
10	0.217	0.228	0.241	0.262	0.303	
11	0.209	0.219	0.232	0.252	0.291	
12	0.201	0.210	0.223	0.243	0.281	
13	0.193	0.203	0.215	0.233	0.270	
14	0.187	0.196	0.209	0.227	0.264	
15	0.181	0.190	0.202	0.219	0.256	
16	0.176	0.184	0.195	0.212	0.248	
17	0.170	0.179	0.190	0.207	0.241	
18	0.166	0.174	0.185	0.201	0.234	
19	0.162	0.171	0.181	0.197	0.230	
20	0.159	0.167	0.177	0.192	0.223	
21	0.155	0.163	0.173	0.188	0.219	
22	0.152	0.160	0.170	0.185	0.214	
23	0.149	0.156	0.165	0.181	0.210	
24	0.145	0.153	0.162	0.177	0.205	
25	0.144	0.151	0.159	0.173	0.202	
26	0.141	0.147	0.156	0.170	0.198	
27	0.138	0.145	0.153	0.166	0.193	
28	0.136	0.142	0.151	0.165	0.191	
29	0.134	0.140	0.149	0.162	0.188	
30	0.132	0.138	0.146	0.159	0.183	
≥ 31	0.741	0.775	0.819	0.895	1.035	d_n

$d_n = (\sqrt{n} - 0.01 + 0.83/\sqrt{n})$

Source: Table L.5, Mason and Ball (1986). Used with permission from Marcel Dekker, Inc.
*The entries in this table are the approximate quantiles w_p of the Lilliefors test statistic T_n as defined by Equation 6.2.4. Reject H_0 at the level α if T_n exceeds $w_{1-\alpha}$ for the particular sample size n .

TABLE A15 Quantiles of the Lilliefors Test Statistic for the Exponential Distribution*

Sample size n	$p =$					
	0.80	0.85	0.90	0.95	0.99	
4	0.303	0.320	0.344	0.374	0.414	d_n
5	0.290	0.302	0.319	0.344	0.398	
6	0.268	0.280	0.295	0.321	0.371	
7	0.252	0.264	0.280	0.304	0.353	
8	0.239	0.251	0.266	0.290	0.333	
9	0.227	0.239	0.253	0.275	0.319	
10	0.217	0.228	0.241	0.262	0.303	
11	0.209	0.219	0.232	0.252	0.291	
12	0.201	0.210	0.223	0.243	0.281	
13	0.193	0.203	0.215	0.233	0.270	
14	0.187	0.196	0.209	0.227	0.264	
15	0.181	0.190	0.202	0.219	0.256	
16	0.176	0.184	0.195	0.212	0.248	
17	0.170	0.179	0.190	0.207	0.241	
18	0.166	0.174	0.185	0.201	0.234	
19	0.162	0.171	0.181	0.197	0.230	
20	0.159	0.167	0.177	0.192	0.223	
21	0.155	0.163	0.173	0.188	0.219	
22	0.152	0.160	0.170	0.185	0.214	
23	0.149	0.156	0.165	0.181	0.210	
24	0.145	0.153	0.162	0.177	0.205	
25	0.144	0.151	0.159	0.173	0.202	
26	0.141	0.147	0.156	0.170	0.198	
27	0.138	0.145	0.153	0.166	0.193	
28	0.136	0.142	0.151	0.165	0.191	
29	0.134	0.140	0.149	0.162	0.188	
30	0.132	0.138	0.146	0.159	0.183	
≥ 31	0.741	0.775	0.819	0.895	1.035	d_n

Source: Adapted from Durbin (1975), with permission from the Biometrika Trustees.
*The entries in this table are selected quantiles w_p of the Lilliefors test statistic T_n as given by Equation 6.2.6. Reject at the level of significance α if T_n is greater than the $1 - \alpha$ quantile given in the table. The approximation for $n > 100$ is merely the exact value for $n = 100$. More accurate approximations for $n > 100$ may be obtained from Table 54 of Pearson and Hartley (1972).
†These quantiles are not presently available.

TABLE A16 Coefficients for the Shapiro-Wilk Test

<i>n</i>	2	3	4	5	6	7	8	9	10
1	0.7071	0.7071	0.6872	0.6646	0.6431	0.6233	0.6052	0.5888	0.5739
2	—	0.0000	0.1667	0.2413	0.2806	0.3031	0.3164	0.3244	0.3291
3	—	—	—	0.0000	0.0875	0.1401	0.1743	0.1976	0.2141
4	—	—	—	—	—	0.0000	0.0561	0.0947	0.1224
5	—	—	—	—	—	—	—	0.0000	0.0399

<i>n</i>	11	12	13	14	15	16	17	18	19	20
1	0.5601	0.5475	0.5359	0.5251	0.5150	0.5056	0.4968	0.4886	0.4808	0.4734
2	0.3315	0.3325	0.3325	0.3318	0.3306	0.3290	0.3273	0.3253	0.3232	0.3211
3	0.2260	0.2347	0.2412	0.2460	0.2495	0.2521	0.2540	0.2553	0.2561	0.2565
4	0.1429	0.1586	0.1707	0.1802	0.1878	0.1939	0.1988	0.2027	0.2059	0.2085
5	0.0695	0.0922	0.1099	0.1240	0.1353	0.1447	0.1524	0.1587	0.1641	0.1686
6	0.0000	0.0303	0.0539	0.0727	0.0880	0.1005	0.1109	0.1197	0.1271	0.1334
7	—	—	0.0000	0.0240	0.0433	0.0593	0.0725	0.0837	0.0932	0.1013
8	—	—	—	—	—	0.0196	0.0359	0.0496	0.0612	0.0711
9	—	—	—	—	—	—	0.0000	0.0163	0.0303	0.0422
10	—	—	—	—	—	—	—	—	0.0000	0.0140

<i>n</i>	21	22	23	24	25	26	27	28	29	30
1	0.4643	0.4590	0.4542	0.4493	0.4450	0.4407	0.4366	0.4328	0.4291	0.4254
2	0.3185	0.3156	0.3126	0.3098	0.3069	0.3043	0.3018	0.2992	0.2968	0.2944
3	0.2578	0.2571	0.2563	0.2554	0.2543	0.2533	0.2522	0.2510	0.2499	0.2487
4	0.2119	0.2131	0.2139	0.2145	0.2148	0.2151	0.2152	0.2151	0.2150	0.2148
5	0.1736	0.1764	0.1787	0.1807	0.1822	0.1836	0.1848	0.1857	0.1864	0.1870
6	0.1399	0.1443	0.1480	0.1512	0.1539	0.1563	0.1584	0.1601	0.1616	0.1630
7	0.1092	0.1150	0.1201	0.1245	0.1283	0.1316	0.1346	0.1372	0.1395	0.1415
8	0.0804	0.0878	0.0941	0.0997	0.1046	0.1089	0.1128	0.1162	0.1192	0.1219
9	0.0530	0.0618	0.0696	0.0764	0.0823	0.0876	0.0923	0.0965	0.1002	0.1036
10	0.0263	0.0368	0.0459	0.0539	0.0610	0.0672	0.0728	0.0778	0.0822	0.0862
11	0.0000	0.0122	0.0228	0.0321	0.0403	0.0476	0.0540	0.0598	0.0650	0.0697
12	—	—	0.0000	0.0107	0.0200	0.0284	0.0358	0.0424	0.0483	0.0537
13	—	—	—	—	0.0000	0.0094	0.0178	0.0253	0.0320	0.0381
14	—	—	—	—	—	—	0.0000	0.0084	0.0159	0.0227
15	—	—	—	—	—	—	—	—	0.0000	0.0076

TABLE A16 (Continued)

<i>n</i>	31	32	33	34	35	36	37	38	39	40
1	0.4220	0.4188	0.4156	0.4127	0.4096	0.4068	0.4040	0.4015	0.3989	0.3964
2	0.2921	0.2898	0.2876	0.2854	0.2834	0.2813	0.2794	0.2774	0.2755	0.2737
3	0.2475	0.2462	0.2451	0.2439	0.2427	0.2415	0.2403	0.2391	0.2380	0.2368
4	0.2145	0.2141	0.2137	0.2132	0.2127	0.2121	0.2116	0.2110	0.2104	0.2098
5	0.1874	0.1878	0.1880	0.1882	0.1883	0.1883	0.1883	0.1881	0.1880	0.1878
6	0.1641	0.1651	0.1660	0.1667	0.1673	0.1678	0.1683	0.1686	0.1689	0.1691
7	0.1433	0.1449	0.1463	0.1475	0.1487	0.1496	0.1505	0.1513	0.1520	0.1526
8	0.1243	0.1265	0.1284	0.1301	0.1317	0.1331	0.1344	0.1356	0.1366	0.1376
9	0.1066	0.1093	0.1118	0.1140	0.1160	0.1179	0.1196	0.1211	0.1225	0.1237
10	0.0899	0.0931	0.0961	0.0988	0.1013	0.1036	0.1056	0.1075	0.1092	0.1108
11	0.0739	0.0777	0.0812	0.0844	0.0873	0.0900	0.0924	0.0947	0.0967	0.0986
12	0.0585	0.0629	0.0669	0.0706	0.0739	0.0770	0.0798	0.0824	0.0848	0.0870
13	0.0435	0.0485	0.0530	0.0572	0.0610	0.0645	0.0677	0.0706	0.0733	0.0759
14	0.0289	0.0344	0.0395	0.0441	0.0484	0.0523	0.0559	0.0592	0.0622	0.0651
15	0.0144	0.0206	0.0262	0.0314	0.0361	0.0404	0.0444	0.0481	0.0515	0.0546
16	0.0000	0.0068	0.0131	0.0187	0.0239	0.0287	0.0331	0.0372	0.0409	0.0444
17	—	—	0.0000	0.0062	0.0119	0.0172	0.0220	0.0264	0.0305	0.0343
18	—	—	—	—	0.0000	0.0057	0.0110	0.0158	0.0203	0.0244
19	—	—	—	—	—	—	0.0000	0.0053	0.0101	0.0146
20	—	—	—	—	—	—	—	—	0.0000	0.0049

<i>n</i>	41	42	43	44	45	46	47	48	49	50
1	0.3940	0.3917	0.3894	0.3872	0.3850	0.3830	0.3808	0.3789	0.3770	0.3751
2	0.2719	0.2701	0.2684	0.2667	0.2651	0.2635	0.2620	0.2604	0.2589	0.2574
3	0.2357	0.2345	0.2334	0.2323	0.2313	0.2302	0.2291	0.2281	0.2271	0.2260
4	0.2091	0.2085	0.2078	0.2072	0.2065	0.2058	0.2052	0.2045	0.2038	0.2032
5	0.1876	0.1874	0.1871	0.1868	0.1865	0.1862	0.1859	0.1855	0.1851	0.1847
6	0.1693	0.1694	0.1695	0.1695	0.1695	0.1695	0.1695	0.1693	0.1692	0.1691
7	0.1531	0.1535	0.1539	0.1542	0.1545	0.1548	0.1550	0.1551	0.1553	0.1554
8	0.1384	0.1392	0.1398	0.1405	0.1410	0.1415	0.1420	0.1423	0.1427	0.1430
9	0.1249	0.1259	0.1269	0.1278	0.1286	0.1293	0.1300	0.1306	0.1312	0.1317
10	0.1123	0.1136	0.1149	0.1160	0.1170	0.1180	0.1189	0.1197	0.1205	0.1212
11	0.1004	0.1020	0.1035	0.1049	0.1062	0.1073	0.1085	0.1095	0.1105	0.1113
12	0.0891	0.0909	0.0927	0.0943	0.0959	0.0972	0.0986	0.0998	0.1010	0.1020
13	0.0782	0.0804	0.0824	0.0842	0.0860	0.0876	0.0892	0.0906	0.0919	0.0932
14	0.0677	0.0701	0.0724	0.0745	0.0765	0.0783	0.0801	0.0817	0.0832	0.0846
15	0.0575	0.0602	0.0628	0.0651	0.0673	0.0694	0.0713	0.0731	0.0748	0.0764

TABLE A16 (Continued)

n	41	42	43	44	45	46	47	48	49	50
16	0.0476	0.0506	0.0534	0.0560	0.0584	0.0607	0.0628	0.0648	0.0667	0.0685
17	0.0379	0.0411	0.0442	0.0471	0.0497	0.0522	0.0546	0.0568	0.0588	0.0608
18	0.0283	0.0318	0.0352	0.0383	0.0412	0.0439	0.0465	0.0489	0.0511	0.0532
19	0.0188	0.0227	0.0263	0.0296	0.0328	0.0357	0.0385	0.0411	0.0436	0.0459
20	0.0094	0.0136	0.0175	0.0211	0.0245	0.0277	0.0307	0.0335	0.0361	0.0386
21	0.0000	0.0045	0.0087	0.0126	0.0163	0.0197	0.0229	0.0259	0.0288	0.0314
22	—	—	0.0000	0.0042	0.0081	0.0118	0.0153	0.0185	0.0215	0.0244
23	—	—	—	—	0.0000	0.0039	0.0076	0.0111	0.0143	0.0174
24	—	—	—	—	—	—	0.0000	0.0037	0.0071	0.0104
25	—	—	—	—	—	—	—	—	0.0000	0.0035

SOURCE: Reprinted from Vol. 2 of Pearson and Hartley (1976), with permission from the Biometrika Trustees.
*The entries in this table are the coefficients a_i for use in the Shapiro-Wilk test statistic for normality given by Equation 6.2.9.

TABLE A17 Quantiles of the Shapiro-Wilk Test Statistic^a

n	0.01	0.02	0.05	0.10	0.50	0.90	0.95	0.98	0.99
3	0.753	0.756	0.767	0.789	0.959	0.998	0.999	1.000	1.000
4	0.687	0.707	0.748	0.792	0.935	0.987	0.992	0.996	0.997
5	0.686	0.715	0.762	0.806	0.927	0.979	0.986	0.991	0.993
6	0.713	0.743	0.788	0.826	0.927	0.974	0.981	0.986	0.989
7	0.730	0.760	0.803	0.838	0.928	0.972	0.979	0.985	0.988
8	0.749	0.778	0.818	0.851	0.932	0.972	0.978	0.984	0.987
9	0.764	0.791	0.829	0.859	0.935	0.972	0.978	0.984	0.986
10	0.781	0.806	0.842	0.869	0.938	0.972	0.978	0.983	0.986
11	0.792	0.817	0.850	0.876	0.940	0.973	0.979	0.984	0.986
12	0.805	0.828	0.859	0.883	0.943	0.973	0.979	0.984	0.986
13	0.814	0.837	0.866	0.889	0.945	0.974	0.979	0.984	0.986
14	0.825	0.846	0.874	0.895	0.947	0.975	0.980	0.984	0.986
15	0.835	0.855	0.881	0.901	0.950	0.975	0.980	0.984	0.987
16	0.844	0.863	0.887	0.906	0.952	0.976	0.981	0.985	0.987
17	0.851	0.869	0.892	0.910	0.954	0.977	0.981	0.985	0.987
18	0.858	0.874	0.897	0.914	0.956	0.978	0.982	0.986	0.988
19	0.863	0.879	0.901	0.917	0.957	0.978	0.982	0.986	0.988
20	0.868	0.884	0.905	0.920	0.959	0.979	0.983	0.987	0.989
21	0.873	0.888	0.908	0.923	0.960	0.980	0.984	0.987	0.989
22	0.878	0.892	0.911	0.926	0.961	0.980	0.984	0.987	0.989
23	0.881	0.895	0.914	0.928	0.962	0.981	0.984	0.987	0.989
24	0.884	0.898	0.916	0.930	0.963	0.981	0.984	0.987	0.989

TABLE A17 (Continued)

n	0.01	0.02	0.05	0.10	0.50	0.90	0.95	0.98	0.99
25	0.888	0.901	0.918	0.931	0.964	0.981	0.985	0.988	0.989
26	0.891	0.904	0.920	0.933	0.965	0.982	0.985	0.988	0.989
27	0.894	0.906	0.923	0.935	0.965	0.982	0.985	0.988	0.990
28	0.896	0.908	0.924	0.936	0.966	0.982	0.985	0.988	0.990
29	0.898	0.910	0.926	0.937	0.966	0.982	0.985	0.988	0.990
30	0.900	0.912	0.927	0.939	0.967	0.983	0.985	0.988	0.990
31	0.902	0.914	0.929	0.940	0.967	0.983	0.986	0.988	0.990
32	0.904	0.915	0.930	0.941	0.968	0.983	0.986	0.988	0.990
33	0.906	0.917	0.931	0.942	0.968	0.983	0.986	0.989	0.990
34	0.908	0.919	0.933	0.943	0.969	0.983	0.986	0.989	0.990
35	0.910	0.920	0.934	0.944	0.969	0.984	0.986	0.989	0.990
36	0.912	0.922	0.935	0.945	0.970	0.984	0.987	0.989	0.990
37	0.914	0.924	0.936	0.946	0.970	0.984	0.987	0.989	0.990
38	0.916	0.925	0.938	0.947	0.971	0.984	0.987	0.989	0.990
39	0.917	0.927	0.939	0.948	0.971	0.984	0.987	0.989	0.991
40	0.919	0.928	0.940	0.949	0.972	0.985	0.987	0.989	0.991
41	0.920	0.929	0.941	0.950	0.972	0.985	0.987	0.989	0.991
42	0.922	0.930	0.942	0.951	0.972	0.985	0.987	0.989	0.991
43	0.923	0.932	0.943	0.951	0.973	0.985	0.987	0.990	0.991
44	0.924	0.933	0.944	0.952	0.973	0.985	0.987	0.990	0.991
45	0.926	0.934	0.945	0.953	0.973	0.985	0.988	0.990	0.991
46	0.927	0.935	0.945	0.953	0.974	0.985	0.988	0.990	0.991
47	0.928	0.936	0.946	0.954	0.974	0.985	0.988	0.990	0.991
48	0.929	0.937	0.947	0.954	0.974	0.985	0.988	0.990	0.991
49	0.929	0.937	0.947	0.955	0.974	0.985	0.988	0.990	0.991
50	0.930	0.938	0.947	0.955	0.974	0.985	0.988	0.990	0.991

SOURCE: Reprinted from Pearson and Hartley (1976), with permission from the Biometrika Trustees.
*The entries in this table are quantiles w_α of the Shapiro-Wilk test statistic given by Equation 6.2.9. Reject H_0 at the level α if $T_3 < w_\alpha$.

TABLE A18 A Method for Converting the Shapiro-Wilk Statistic to Approximate Normality

n	$v(d_n)$	3	4	5	6	n	$v(d_n)$	3	4	5	6
		(0.7500)	(0.6297)	(0.5521)	(0.4963)			(0.7500)	(0.6297)	(0.5521)	(0.4963)
-7.0	-3.29	—	—	—	—	2.2	0.52	0.74	0.75	0.64	0.64
-5.4	-2.81	—	—	—	—	2.6	0.67	1.00	1.09	1.06	1.06
-5.0	-2.68	—	—	—	—	3.0	0.81	1.23	1.40	1.45	1.45
-4.6	-2.54	—	—	—	—	3.4	0.95	1.44	1.67	1.83	1.83
-4.2	-2.40	—	—	—	—	3.8	1.07	1.65	1.91	2.17	2.17
-3.8	-2.25	—	—	—	—	4.2	1.19	1.85	2.15	2.50	2.50
-3.4	-2.10	—	—	—	—	4.6	1.31	2.03	2.47	2.77	2.77
-3.0	-1.94	—	—	—	—	5.0	1.42	2.19	2.85	3.09	3.09
-2.6	-1.77	—	—	—	—	5.4	1.52	2.34	3.24	3.54	3.54
-2.2	-1.59	—	—	—	—	5.8	1.62	2.48	3.64	—	—
-1.8	-1.40	—	—	—	—	6.2	1.72	2.62	—	—	—
-1.4	-1.21	—	—	—	—	6.6	1.81	2.75	—	—	—
-1.0	-1.01	—	—	—	—	7.0	1.90	2.87	—	—	—
-0.6	-0.80	—	—	—	—	7.4	1.98	2.97	—	—	—
-0.2	-0.60	—	—	—	—	7.8	2.07	3.08	—	—	—
0.2	-0.39	—	—	—	—	8.2	2.15	3.22	—	—	—
0.6	-0.19	—	—	—	—	8.6	2.23	3.36	—	—	—
1.0	0.00	—	—	—	—	9.0	2.31	—	—	—	—
1.4	0.18	—	—	—	—	9.4	2.38	—	—	—	—
1.8	0.35	—	—	—	—	9.8	2.45	—	—	—	—

For $3 \leq n \leq 6$, first compute $v = \ln [(T - d_n)/(1 - T)]$ where d_n is given at the top of the table and T is the Shapiro-Wilk statistic. Then enter the table with v and n to find G , which is approximately normal.

TABLE A18 (Continued)

n	b_n	c_n	d_n	n	b_n	c_n	d_n
7	-2.356	1.245	0.4533	29	-6.074	1.934	0.1907
8	-2.696	1.333	0.4186	30	-6.150	1.949	0.1872
9	-2.968	1.400	0.3900	31	-6.248	1.965	0.1840
10	-3.262	1.471	0.3600	32	-6.324	1.976	0.1811
11	-3.485	1.515	0.3451	33	-6.402	1.988	0.1781
12	-3.731	1.571	0.3270	34	-6.480	2.000	0.1755
13	-3.936	1.613	0.3111	35	-6.559	2.012	0.1727
14	-4.155	1.655	0.2969	36	-6.640	2.024	0.1702
15	-4.373	1.695	0.2842	37	-6.721	2.037	0.1677
16	-4.567	1.724	0.2727	38	-6.803	2.049	0.1656
17	-4.713	1.739	0.2622	39	-6.887	2.062	0.1633
18	-4.885	1.770	0.2528	40	-6.961	2.075	0.1612
19	-5.018	1.786	0.2440	41	-7.035	2.088	0.1591
20	-5.153	1.802	0.2359	42	-7.111	2.101	0.1572
21	-5.291	1.818	0.2264	43	-7.188	2.114	0.1552
22	-5.413	1.835	0.2207	44	-7.266	2.128	0.1534
23	-5.508	1.848	0.2157	45	-7.345	2.141	0.1516
24	-5.605	1.862	0.2106	46	-7.414	2.155	0.1499
25	-5.704	1.876	0.2063	47	-7.484	2.169	0.1482
26	-5.803	1.890	0.2020	48	-7.555	2.183	0.1466
27	-5.905	1.905	0.1980	49	-7.615	2.198	0.1451
28	-5.988	1.919	0.1943	50	-7.677	2.212	0.1436

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For $7 \leq n \leq 50$, enter the table above with n to find the coefficients b_n , c_n , and d_n . Then compute

$$G = b_n + c_n \ln \{(T - d_n)/(1 - T)\}$$

which is approximately standard normal.

TABLE A19 Quantiles of the Smirnov Test Statistic for Two Samples of Equal Size n*

One-Sided Test: $p = 0.90$						One-Sided Test: $p = 0.90$					
Two-Sided Test: $p = 0.80$						Two-Sided Test: $p = 0.80$					
$n = 3$	2/3	2/3	0.95	0.975	0.99	0.995	$n = 22$	7/22	8/22	8/22	10/22
4	3/4	3/4	3/4	3/4			23	7/23	8/23	9/23	10/23
5	3/5	3/5	4/5	4/5	4/5		24	7/24	8/24	9/24	10/24
6	3/6	4/6	4/6	4/6	5/6	5/6	25	7/25	8/25	9/25	10/25
7	4/7	4/7	5/7	5/7	5/7	5/7	26	7/26	8/26	9/26	10/26
8	4/8	4/8	5/8	5/8	5/8	6/8	27	7/27	8/27	9/27	11/27
9	4/9	5/9	5/9	6/9	6/9	6/9	28	8/28	9/28	10/28	11/28
10	4/10	5/10	6/10	6/10	7/10	7/10	29	8/29	9/29	10/29	11/29
11	5/11	5/11	6/11	7/11	7/11	7/11	30	8/30	9/30	10/30	11/30
12	5/12	5/12	6/12	7/12	7/12	7/12	31	8/31	9/31	10/31	11/31
13	5/13	6/13	6/13	7/13	8/13	8/13	32	8/32	9/32	10/32	11/32
14	5/14	6/14	7/14	7/14	8/14	8/14	33	8/33	9/33	11/33	12/33
15	5/15	6/15	7/15	8/15	8/15	8/15	34	8/34	10/34	11/34	12/34
16	6/16	6/16	7/16	8/16	9/16	9/16	35	8/35	10/35	11/35	12/35
17	6/17	7/17	7/17	8/17	9/17	9/17	36	9/36	10/36	11/36	12/36
18	6/18	7/18	8/18	9/18	9/18	9/18	37	9/37	10/37	11/37	12/37
19	6/19	7/19	8/19	9/19	9/19	9/19	38	9/38	10/38	11/38	12/38
20	6/20	7/20	8/20	9/20	10/20	10/20	39	9/39	10/39	11/39	12/39
21	6/21	7/21	8/21	9/21	10/21	10/21	40	9/40	10/40	12/40	13/40
						Approximation for $n > 40$:					
						$\frac{1.52}{\sqrt{n}}$					
						$\frac{1.73}{\sqrt{n}}$					
						$\frac{1.92}{\sqrt{n}}$					
						$\frac{2.15}{\sqrt{n}}$					
						$\frac{2.30}{\sqrt{n}}$					

SOURCE: Adapted from Birnbaum and Hall (1960), with permission from the Institute of Mathematical Statistics.
*The entries in this table are selected quantiles w_p of the Smirnov two-sample test statistic T defined by Equations 6.3.2 and 6.3.3 for the one-sided test and defined by Equation 6.3.1 for the two-sided test. Reject H_0 at the level α if T exceeds the $1 - \alpha$ quantile of T as given in this table. The test statistic is a discrete random variable, so the exact level of significance may be less than the apparent α used in this table.

TABLE A20 Quantiles of the Smirnov Test Statistic for Two Samples of Different Size n and m*

One-Sided Test:		One-Sided Test:													
$p = 0.90$		$p = 0.90$						$p = 0.95$							
Two-Sided Test:		Two-Sided Test:													
$p = 0.80$		$p = 0.80$													
$N_1 = 1$		$N_1 = 1$													
		$N_2 = 9$													
		$N_2 = 10$													
		$N_2 = 11$													
		$N_2 = 12$													
		$N_2 = 13$													
		$N_2 = 14$													
		$N_2 = 15$													
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		$N_2 = 67$													
		$N_2 = 68$													
		$N_2 = 69$													
		$N_2 = 70$													

TABLE A20 (Continued)

One-Sided Test:		p = 0.90		p = 0.80		p = 0.95		p = 0.99		p = 0.995	
Two-Sided Test:		p = 0.90		p = 0.80		p = 0.95		p = 0.99		p = 0.995	
$N_1 = 7$	$N_2 = 8$	27/56	33/56	39/70	47/56	5/8	15/28	41/56	5/8	3/4	47/63
	$N_2 = 9$	31/63	5/9	39/70	5/7	40/63	5/7	5/7	40/63	5/7	47/63
	$N_2 = 10$	33/70	5/9	39/70	5/7	43/70	5/7	5/7	43/70	5/7	5/7
	$N_2 = 14$	3/7	1/2	1/2	4/7	4/7	15/28	17/28	4/7	9/14	9/14
$N_1 = 8$	$N_2 = 9$	4/9	13/24	21/40	23/40	5/8	7/12	27/40	5/8	3/4	3/4
	$N_2 = 10$	19/40	1/2	1/2	5/8	7/12	7/12	5/8	7/12	2/3	2/3
	$N_2 = 12$	11/24	1/2	1/2	5/8	9/16	9/16	5/8	9/16	5/8	5/8
	$N_2 = 16$	7/16	1/2	1/2	9/16	1/2	1/2	9/16	1/2	19/32	19/32
$N_1 = 9$	$N_2 = 10$	7/15	1/2	1/2	26/45	1/2	26/45	2/3	1/2	31/45	31/45
	$N_2 = 12$	4/9	1/2	1/2	5/9	1/2	5/9	11/18	1/2	2/3	2/3
	$N_2 = 15$	19/45	22/45	3/5	8/15	1/2	8/15	3/5	1/2	29/45	29/45
	$N_2 = 18$	7/18	4/9	5/9	1/2	1/2	1/2	5/9	1/2	11/18	11/18
$N_1 = 10$	$N_2 = 15$	13/36	5/12	5/12	17/36	1/2	17/36	19/36	1/2	5/9	5/9
	$N_2 = 20$	2/5	7/15	9/20	1/2	1/2	1/2	17/30	1/2	19/30	19/30
	$N_2 = 25$	7/20	9/20	9/20	1/2	1/2	1/2	11/20	1/2	3/5	3/5
	$N_2 = 40$	7/20	2/5	2/5	9/20	1/2	9/20	1/2	1/2	—	—
$N_1 = 12$	$N_2 = 15$	23/60	9/20	7/16	23/48	1/2	23/48	11/20	1/2	7/12	7/12
	$N_2 = 16$	3/8	7/16	5/12	17/36	1/2	17/36	13/24	1/2	7/12	7/12
	$N_2 = 18$	13/36	5/12	5/12	7/15	1/2	7/15	19/36	1/2	5/9	5/9
	$N_2 = 20$	11/30	2/5	2/5	31/60	1/2	31/60	17/30	1/2	17/30	17/30
$N_1 = 15$	$N_2 = 20$	7/20	2/5	2/5	13/30	1/2	13/30	29/60	1/2	31/60	31/60
	$N_2 = 25$	27/80	31/80	17/40	17/40	1/2	17/40	19/40	1/2	41/80	41/80
Large sample approximation		$1.07 \sqrt{\frac{m+n}{mn}}$	$1.22 \sqrt{\frac{m+n}{mn}}$	$1.36 \sqrt{\frac{m+n}{mn}}$	$1.52 \sqrt{\frac{m+n}{mn}}$	$1.63 \sqrt{\frac{m+n}{mn}}$	$1.63 \sqrt{\frac{m+n}{mn}}$	$1.63 \sqrt{\frac{m+n}{mn}}$	$1.63 \sqrt{\frac{m+n}{mn}}$	$1.63 \sqrt{\frac{m+n}{mn}}$	$1.63 \sqrt{\frac{m+n}{mn}}$

SOURCE: Adapted from Massey (1952), with permission from the Institute of Mathematical Statistics.
*The entries in this table are selected quantiles w_p of the Smirnov test statistic T for two samples, defined by Equations 6.3.1, 6.3.2, and 6.3.3. To enter the table let N_1 be the smaller sample size and let N_2 be the larger sample size. Reject H_0 at the level α if T exceeds $w_{1-\alpha}$ as given in this table. If n and m are not covered by this table, use the large sample approximation given at the end of the table, or consult exact tables by Kim and Jennrich, which appear in Hartner and Owen (1970) for $n, m \leq 100$.

TABLE A21 The t Distribution*

Degrees of Freedom	p = 0.6	0.75	0.9	0.95	0.975	0.99	0.995	0.9975	0.999	0.9995
1	0.325	1.000	3.078	6.314	12.706	31.821	63.657	127.32	318.31	636.62
2	0.289	0.816	2.920	5.986	12.706	31.821	63.657	127.32	318.31	636.62
3	0.277	0.765	2.838	5.753	12.706	31.821	63.657	127.32	318.31	636.62
4	0.271	0.741	2.776	5.598	12.706	31.821	63.657	127.32	318.31	636.62
5	0.267	0.727	2.731	5.508	12.706	31.821	63.657	127.32	318.31	636.62
6	0.265	0.718	2.693	5.451	12.706	31.821	63.657	127.32	318.31	636.62
7	0.263	0.711	2.663	5.409	12.706	31.821	63.657	127.32	318.31	636.62
8	0.262	0.706	2.642	5.373	12.706	31.821	63.657	127.32	318.31	636.62
9	0.261	0.703	2.633	5.353	12.706	31.821	63.657	127.32	318.31	636.62
10	0.260	0.700	2.624	5.338	12.706	31.821	63.657	127.32	318.31	636.62
11	0.260	0.697	2.618	5.328	12.706	31.821	63.657	127.32	318.31	636.62
12	0.259	0.695	2.613	5.321	12.706	31.821	63.657	127.32	318.31	636.62
13	0.259	0.694	2.609	5.316	12.706	31.821	63.657	127.32	318.31	636.62
14	0.258	0.692	2.606	5.312	12.706	31.821	63.657	127.32	318.31	636.62
15	0.258	0.691	2.603	5.309	12.706	31.821	63.657	127.32	318.31	636.62
16	0.258	0.690	2.601	5.307	12.706	31.821	63.657	127.32	318.31	636.62
17	0.257	0.689	2.599	5.305	12.706	31.821	63.657	127.32	318.31	636.62
18	0.257	0.688	2.597	5.303	12.706	31.821	63.657	127.32	318.31	636.62
19	0.257	0.688	2.596	5.302	12.706	31.821	63.657	127.32	318.31	636.62
20	0.257	0.687	2.595	5.301	12.706	31.821	63.657	127.32	318.31	636.62
21	0.257	0.686	2.594	5.300	12.706	31.821	63.657	127.32	318.31	636.62
22	0.256	0.686	2.593	5.299	12.706	31.821	63.657	127.32	318.31	636.62
23	0.256	0.685	2.592	5.298	12.706	31.821	63.657	127.32	318.31	636.62
24	0.256	0.685	2.591	5.297	12.706	31.821	63.657	127.32	318.31	636.62
25	0.256	0.684	2.590	5.296	12.706	31.821	63.657	127.32	318.31	636.62
26	0.256	0.684	2.589	5.295	12.706	31.821	63.657	127.32	318.31	636.62
27	0.256	0.684	2.588	5.294	12.706	31.821	63.657	127.32	318.31	636.62
28	0.256	0.683	2.587	5.293	12.706	31.821	63.657	127.32	318.31	636.62
29	0.256	0.683	2.586	5.292	12.706	31.821	63.657	127.32	318.31	636.62
30	0.256	0.683	2.585	5.291	12.706	31.821	63.657	127.32	318.31	636.62
40	0.255	0.681	2.580	5.284	12.706	31.821	63.657	127.32	318.31	636.62
60	0.254	0.679	2.574	5.274	12.706	31.821	63.657	127.32	318.31	636.62
120	0.254	0.677	2.568	5.268	12.706	31.821	63.657	127.32	318.31	636.62
∞	0.253	0.674	2.562	5.262	12.706	31.821	63.657	127.32	318.31	636.62

TABLE A22 The F Distribution with k_1 and k_2 Degrees of Freedom (0.75 Quantiles)

$k_1 \backslash k_2$	1	2	3	4	5	6	7	8	9
1	5.83	7.50	8.20	8.58	8.82	8.98	9.10	9.19	9.26
2	2.57	3.00	3.15	3.23	3.28	3.31	3.34	3.35	3.37
3	2.02	2.28	2.36	2.39	2.41	2.42	2.43	2.44	2.44
4	1.81	2.00	2.05	2.06	2.07	2.08	2.08	2.08	2.08
5	1.69	1.85	1.88	1.89	1.89	1.89	1.89	1.89	1.89
6	1.62	1.76	1.78	1.79	1.79	1.78	1.78	1.78	1.77
7	1.57	1.70	1.72	1.72	1.71	1.71	1.70	1.70	1.69
8	1.54	1.66	1.67	1.66	1.66	1.65	1.64	1.64	1.63
9	1.51	1.62	1.63	1.63	1.62	1.61	1.60	1.60	1.59
10	1.49	1.60	1.60	1.59	1.59	1.58	1.57	1.56	1.56
11	1.47	1.58	1.58	1.57	1.56	1.55	1.54	1.53	1.53
12	1.46	1.56	1.56	1.55	1.54	1.53	1.52	1.51	1.51
13	1.45	1.55	1.55	1.53	1.52	1.51	1.50	1.49	1.49
14	1.44	1.53	1.53	1.52	1.51	1.50	1.49	1.48	1.47
15	1.43	1.52	1.52	1.51	1.49	1.48	1.47	1.46	1.46
16	1.42	1.51	1.51	1.50	1.48	1.47	1.46	1.45	1.44
17	1.42	1.51	1.50	1.49	1.47	1.46	1.45	1.44	1.43
18	1.41	1.50	1.49	1.48	1.46	1.45	1.44	1.43	1.42
19	1.41	1.49	1.49	1.47	1.46	1.44	1.43	1.42	1.41
20	1.40	1.49	1.48	1.47	1.45	1.44	1.43	1.42	1.41
21	1.40	1.48	1.48	1.46	1.44	1.43	1.42	1.41	1.40
22	1.40	1.48	1.47	1.45	1.44	1.42	1.41	1.40	1.39
23	1.39	1.47	1.47	1.45	1.43	1.42	1.41	1.40	1.39
24	1.39	1.47	1.46	1.44	1.43	1.41	1.40	1.39	1.38
25	1.39	1.47	1.46	1.44	1.42	1.41	1.40	1.39	1.38
26	1.38	1.46	1.45	1.44	1.42	1.41	1.39	1.38	1.37
27	1.38	1.46	1.45	1.43	1.42	1.40	1.39	1.38	1.37
28	1.38	1.46	1.45	1.43	1.41	1.40	1.39	1.38	1.37
29	1.38	1.45	1.45	1.43	1.41	1.40	1.38	1.37	1.36
30	1.38	1.45	1.44	1.42	1.41	1.39	1.38	1.37	1.36
40	1.36	1.44	1.42	1.40	1.39	1.37	1.36	1.35	1.34
60	1.35	1.42	1.41	1.38	1.37	1.35	1.33	1.32	1.31
120	1.34	1.40	1.39	1.37	1.35	1.33	1.31	1.30	1.29
∞	1.32	1.39	1.37	1.35	1.33	1.31	1.29	1.28	1.27

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TABLE A22 (Continued)

	10	12	15	20	24	30	40	60	120	∞
10	9.32	9.41	9.49	9.58	9.63	9.67	9.71	9.76	9.80	9.85
20	3.38	3.39	3.41	3.43	3.43	3.44	3.45	3.46	3.47	3.48
30	2.44	2.45	2.46	2.46	2.46	2.47	2.47	2.47	2.47	2.47
40	2.08	2.08	2.08	2.08	2.08	2.08	2.08	2.08	2.08	2.08
50	1.89	1.89	1.89	1.88	1.88	1.88	1.88	1.87	1.87	1.87
60	1.77	1.77	1.76	1.76	1.75	1.75	1.75	1.74	1.74	1.74
70	1.69	1.68	1.68	1.67	1.67	1.66	1.66	1.65	1.65	1.65
80	1.63	1.62	1.62	1.61	1.60	1.60	1.59	1.59	1.58	1.58
90	1.59	1.58	1.57	1.56	1.56	1.55	1.54	1.54	1.53	1.53
100	1.55	1.54	1.53	1.52	1.52	1.51	1.51	1.50	1.49	1.48
120	1.52	1.51	1.50	1.49	1.49	1.48	1.47	1.47	1.46	1.45
140	1.50	1.49	1.48	1.47	1.46	1.45	1.45	1.44	1.43	1.42
160	1.48	1.47	1.46	1.45	1.44	1.43	1.42	1.42	1.41	1.40
180	1.46	1.45	1.44	1.43	1.42	1.41	1.41	1.40	1.39	1.38
200	1.45	1.44	1.43	1.41	1.41	1.40	1.39	1.38	1.37	1.36
250	1.44	1.43	1.41	1.40	1.39	1.38	1.37	1.36	1.35	1.34
300	1.43	1.41	1.40	1.39	1.38	1.37	1.36	1.35	1.34	1.33
400	1.42	1.40	1.39	1.38	1.37	1.36	1.35	1.34	1.33	1.32
500	1.41	1.40	1.38	1.37	1.36	1.35	1.34	1.33	1.32	1.30
600	1.40	1.39	1.37	1.36	1.35	1.34	1.33	1.32	1.31	1.29
800	1.39	1.38	1.37	1.35	1.34	1.33	1.32	1.31	1.30	1.28
1000	1.39	1.37	1.36	1.34	1.33	1.32	1.31	1.30	1.29	1.28
1200	1.38	1.37	1.35	1.34	1.33	1.32	1.31	1.30	1.28	1.27
1400	1.38	1.36	1.35	1.33	1.32	1.31	1.29	1.28	1.27	1.26
1600	1.37	1.36	1.34	1.33	1.32	1.31	1.29	1.28	1.26	1.25
1800	1.37	1.35	1.34	1.32	1.31	1.30	1.28	1.27	1.26	1.24
2000	1.36	1.35	1.33	1.32	1.31	1.30	1.28	1.27	1.26	1.24
2500	1.36	1.34	1.33	1.31	1.30	1.29	1.27	1.26	1.25	1.24
3000	1.35	1.34	1.32	1.31	1.30	1.29	1.27	1.26	1.25	1.23
4000	1.35	1.34	1.32	1.28	1.29	1.28	1.27	1.26	1.24	1.23
5000	1.33	1.31	1.30	1.28	1.26	1.25	1.24	1.22	1.21	1.19
6000	1.30	1.29	1.27	1.25	1.24	1.22	1.21	1.19	1.17	1.15
8000	1.28	1.26	1.24	1.22	1.21	1.19	1.18	1.16	1.13	1.10
10000	1.25	1.24	1.22	1.19	1.18	1.16	1.14	1.12	1.08	1.00

TABLE A22 (Continued) (0.90 Quantiles)

$k_1 \backslash k_2$	1	2	3	4	5	6	7	8	9
1	39.86	49.50	53.59	55.83	57.24	58.20	58.91	59.44	59.86
2	8.53	9.00	9.16	9.24	9.29	9.33	9.35	9.37	9.38
3	5.54	5.46	5.39	5.34	5.31	5.28	5.27	5.25	5.24
4	4.54	4.32	4.19	4.11	4.05	4.01	3.98	3.95	3.94
5	4.06	3.78	3.62	3.52	3.45	3.40	3.37	3.34	3.32
6	3.78	3.46	3.29	3.18	3.11	3.05	3.01	2.98	2.96
7	3.59	3.26	3.07	2.96	2.88	2.83	2.78	2.75	2.72
8	3.46	3.11	2.92	2.81	2.73	2.67	2.62	2.59	2.56
9	3.36	3.01	2.81	2.69	2.61	2.55	2.51	2.47	2.44
10	3.29	2.92	2.73	2.61	2.52	2.46	2.41	2.38	2.35
11	3.23	2.86	2.66	2.54	2.45	2.39	2.34	2.30	2.27
12	3.18	2.81	2.61	2.48	2.39	2.33	2.28	2.24	2.21
13	3.14	2.76	2.56	2.43	2.35	2.28	2.23	2.20	2.16
14	3.10	2.73	2.52	2.39	2.31	2.24	2.19	2.15	2.12
15	3.07	2.70	2.49	2.36	2.27	2.21	2.16	2.12	2.09
16	3.05	2.67	2.46	2.33	2.24	2.18	2.13	2.09	2.06
17	3.03	2.64	2.44	2.31	2.22	2.15	2.10	2.06	2.03
18	3.01	2.62	2.42	2.29	2.20	2.13	2.08	2.04	2.00
19	2.99	2.61	2.40	2.27	2.18	2.11	2.06	2.02	1.98
20	2.97	2.59	2.38	2.25	2.16	2.09	2.04	2.00	1.96
21	2.96	2.57	2.36	2.23	2.14	2.08	2.02	1.98	1.95
22	2.95	2.56	2.35	2.22	2.13	2.06	2.01	1.97	1.93
23	2.94	2.55	2.34	2.21	2.11	2.05	1.99	1.95	1.92
24	2.93	2.54	2.33	2.19	2.10	2.04	1.98	1.94	1.91
25	2.92	2.53	2.32	2.18	2.09	2.02	1.97	1.93	1.89
26	2.91	2.52	2.31	2.17	2.08	2.01	1.96	1.92	1.88
27	2.90	2.51	2.30	2.17	2.07	2.00	1.95	1.91	1.87
28	2.89	2.50	2.29	2.16	2.06	2.00	1.94	1.90	1.87
29	2.89	2.50	2.28	2.15	2.06	1.99	1.93	1.89	1.86
30	2.88	2.49	2.28	2.14	2.05	1.98	1.93	1.88	1.85
40	2.84	2.44	2.23	2.09	2.00	1.93	1.87	1.83	1.79
60	2.79	2.39	2.18	2.04	1.95	1.87	1.82	1.77	1.74
120	2.75	2.35	2.13	1.99	1.90	1.82	1.77	1.72	1.68
∞	2.71	2.30	2.08	1.94	1.85	1.77	1.72	1.67	1.63

TABLE A22 (Continued)

10	12	15	20	24	30	40	60	120	∞
60.19	60.71	61.22	61.74	62.00	62.26	62.53	62.79	63.06	63.33
9.39	9.41	9.42	9.44	9.45	9.46	9.47	9.47	9.48	9.49
5.23	5.22	5.20	5.18	5.18	5.17	5.16	5.15	5.14	5.13
3.92	3.90	3.87	3.84	3.83	3.83	3.80	3.79	3.78	3.76
3.30	3.27	3.24	3.21	3.19	3.17	3.16	3.14	3.12	3.10
2.94	2.90	2.87	2.84	2.82	2.80	2.78	2.76	2.74	2.72
2.70	2.67	2.63	2.59	2.58	2.56	2.54	2.51	2.49	2.47
2.54	2.50	2.46	2.42	2.40	2.38	2.36	2.34	2.32	2.29
2.42	2.38	2.34	2.30	2.28	2.25	2.23	2.21	2.18	2.16
2.32	2.28	2.24	2.20	2.18	2.16	2.13	2.11	2.08	2.06
2.25	2.21	2.17	2.12	2.10	2.03	2.05	2.03	2.00	1.97
2.19	2.15	2.10	2.06	2.04	2.01	1.99	1.96	1.93	1.90
2.14	2.10	2.05	2.01	1.98	1.96	1.93	1.90	1.88	1.85
2.10	2.05	2.01	1.96	1.94	1.91	1.89	1.86	1.83	1.80
2.06	2.02	1.97	1.92	1.90	1.87	1.85	1.82	1.79	1.76
2.03	1.99	1.94	1.89	1.87	1.84	1.81	1.78	1.75	1.72
2.00	1.96	1.91	1.86	1.84	1.81	1.78	1.75	1.72	1.69
1.98	1.93	1.89	1.84	1.81	1.78	1.75	1.72	1.69	1.68
1.96	1.91	1.86	1.81	1.79	1.76	1.73	1.70	1.67	1.63
1.94	1.89	1.84	1.79	1.77	1.74	1.71	1.68	1.64	1.61
1.92	1.87	1.83	1.78	1.75	1.72	1.69	1.66	1.62	1.59
1.90	1.86	1.81	1.76	1.73	1.70	1.67	1.64	1.60	1.57
1.89	1.84	1.80	1.74	1.72	1.69	1.66	1.62	1.59	1.55
1.88	1.83	1.78	1.73	1.70	1.67	1.64	1.61	1.57	1.53
1.87	1.82	1.77	1.72	1.69	1.66	1.63	1.59	1.56	1.52
1.86	1.81	1.76	1.71	1.68	1.65	1.61	1.58	1.54	1.50
1.85	1.80	1.75	1.70	1.66	1.63	1.59	1.56	1.52	1.49
1.84	1.79	1.74	1.69	1.66	1.63	1.59	1.56	1.52	1.48
1.83	1.78	1.73	1.68	1.65	1.62	1.58	1.55	1.51	1.47
1.82	1.77	1.72	1.67	1.64	1.61	1.57	1.54	1.50	1.46
1.76	1.71	1.66	1.61	1.57	1.54	1.51	1.47	1.42	1.38
1.71	1.66	1.60	1.54	1.51	1.48	1.44	1.40	1.35	1.29
1.65	1.60	1.55	1.48	1.45	1.41	1.37	1.32	1.26	1.19
1.60	1.55	1.49	1.42	1.38	1.34	1.30	1.24	1.17	1.00

TABLE A22 (Continued) (0.95 Quantiles)

k_1 k_2	1	2	3	4	5	6	7	8	9
1	161.4	199.5	215.7	224.6	230.2	234.0	236.8	238.9	240.5
2	18.51	19.00	19.16	19.25	19.30	19.33	19.35	19.37	19.38
3	10.13	9.55	9.28	9.12	9.01	8.94	8.89	8.85	8.81
4	7.71	6.94	6.59	6.39	6.26	6.16	6.09	6.04	6.00
5	6.61	5.79	5.41	5.19	5.05	4.95	4.88	4.82	4.77
6	5.99	5.14	4.76	4.53	4.39	4.28	4.21	4.15	4.10
7	5.59	4.74	4.35	4.12	3.97	3.87	3.79	3.73	3.68
8	5.32	4.46	4.07	3.84	3.69	3.58	3.50	3.44	3.39
9	5.12	4.26	3.86	3.63	3.48	3.37	3.29	3.23	3.18
10	4.96	4.10	3.71	3.48	3.33	3.22	3.14	3.07	3.02
11	4.84	3.98	3.59	3.36	3.20	3.09	3.01	2.95	2.90
12	4.75	3.89	3.49	3.26	3.11	3.00	2.91	2.85	2.80
13	4.67	3.81	3.41	3.18	3.03	2.92	2.83	2.77	2.71
14	4.60	3.74	3.34	3.11	2.96	2.85	2.76	2.70	2.65
15	4.54	3.68	3.29	3.06	2.90	2.79	2.71	2.64	2.59
16	4.49	3.63	3.24	3.01	2.85	2.74	2.66	2.59	2.54
17	4.45	3.59	3.20	2.96	2.81	2.70	2.61	2.55	2.49
18	4.41	3.55	3.16	2.93	2.77	2.66	2.58	2.51	2.46
19	4.38	3.52	3.13	2.90	2.74	2.63	2.54	2.48	2.42
20	4.35	3.49	3.10	2.87	2.71	2.60	2.51	2.45	2.39
21	4.32	3.47	3.07	2.84	2.68	2.57	2.49	2.42	2.37
22	4.30	3.44	3.05	2.82	2.66	2.55	2.46	2.40	2.34
23	4.28	3.42	3.03	2.80	2.64	2.53	2.44	2.37	2.32
24	4.26	3.40	3.01	2.78	2.62	2.51	2.42	2.36	2.30
25	4.24	3.39	2.99	2.76	2.60	2.49	2.40	2.34	2.28
26	4.23	3.37	2.98	2.74	2.59	2.47	2.39	2.32	2.27
27	4.21	3.35	2.96	2.73	2.57	2.46	2.37	2.31	2.25
28	4.20	3.34	2.95	2.71	2.56	2.45	2.36	2.29	2.24
29	4.18	3.33	2.93	2.70	2.55	2.43	2.35	2.28	2.22
30	4.17	3.32	2.92	2.69	2.53	2.42	2.33	2.27	2.21
40	4.08	3.23	2.84	2.61	2.45	2.34	2.25	2.18	2.12
60	4.00	3.15	2.76	2.53	2.37	2.25	2.17	2.10	2.04
120	3.92	3.07	2.68	2.45	2.29	2.17	2.09	2.02	1.96
∞	3.84	3.00	2.60	2.37	2.21	2.10	2.01	1.94	1.88

TABLE A22 (Continued)

10	12	15	20	24	30	40	60	120	∞
241.9	243.9	245.9	248.0	249.1	250.1	251.1	252.2	253.3	254.3
19.40	19.41	19.43	19.45	19.45	19.46	19.47	19.48	19.49	19.50
8.79	8.74	8.70	8.66	8.64	8.62	8.59	8.57	8.55	8.53
5.96	5.91	5.86	5.80	5.77	5.75	5.72	5.69	5.66	5.63
4.74	4.68	4.62	4.56	4.53	4.50	4.46	4.43	4.40	4.36
4.06	4.00	3.94	3.87	3.84	3.81	3.77	3.74	3.70	3.67
3.64	3.57	3.51	3.44	3.41	3.38	3.34	3.30	3.27	3.23
3.35	3.28	3.22	3.15	3.12	3.08	3.04	3.01	2.97	2.93
3.14	3.07	3.01	2.94	2.90	2.86	2.83	2.79	2.75	2.71
2.98	2.91	2.85	2.77	2.74	2.70	2.66	2.62	2.58	2.54
2.85	2.79	2.72	2.65	2.61	2.57	2.53	2.49	2.45	2.40
2.75	2.69	2.62	2.54	2.51	2.47	2.43	2.38	2.34	2.30
2.67	2.60	2.53	2.46	2.42	2.38	2.34	2.30	2.25	2.21
2.60	2.53	2.46	2.39	2.35	2.31	2.27	2.22	2.18	2.13
2.54	2.48	2.40	2.33	2.29	2.25	2.20	2.16	2.11	2.07
2.49	2.42	2.35	2.28	2.24	2.19	2.15	2.11	2.06	2.01
2.45	2.38	2.31	2.23	2.19	2.15	2.10	2.06	2.01	1.96
2.41	2.34	2.27	2.19	2.15	2.11	2.06	2.02	1.97	1.92
2.38	2.31	2.23	2.16	2.11	2.07	2.03	1.98	1.93	1.88
2.35	2.28	2.20	2.12	2.08	2.04	1.99	1.95	1.90	1.84
2.32	2.25	2.18	2.10	2.05	2.01	1.96	1.92	1.87	1.81
2.30	2.23	2.15	2.07	2.03	1.98	1.94	1.89	1.84	1.78
2.27	2.20	2.13	2.05	2.01	1.96	1.91	1.86	1.81	1.76
2.25	2.18	2.11	2.03	1.98	1.94	1.89	1.84	1.79	1.73
2.24	2.16	2.09	2.01	1.96	1.92	1.87	1.82	1.77	1.71
2.22	2.15	2.07	1.99	1.95	1.90	1.85	1.80	1.75	1.69
2.20	2.13	2.06	1.97	1.93	1.88	1.84	1.79	1.73	1.67
2.19	2.12	2.04	1.96	1.91	1.87	1.82	1.77	1.71	1.65
2.18	2.10	2.03	1.94	1.90	1.85	1.81	1.75	1.70	1.64
2.16	2.09	2.01	1.93	1.89	1.84	1.79	1.74	1.68	1.62
2.08	2.00	1.92	1.84	1.79	1.74	1.69	1.64	1.58	1.51
1.99	1.92	1.84	1.75	1.70	1.65	1.59	1.53	1.47	1.39
1.91	1.83	1.75	1.66	1.61	1.55	1.50	1.43	1.35	1.25
1.83	1.75	1.67	1.57	1.52	1.46	1.39	1.32	1.22	1.00

TABLE A22 (Continued) (0.975 Quantiles)

k_1	1	2	3	4	5	6	7	8	9
k_2									
1	647.8	799.5	864.2	899.6	921.8	937.1	948.2	956.7	963.3
2	38.51	39.00	39.17	39.25	39.30	39.33	39.36	39.37	39.39
3	17.44	16.04	15.44	15.10	14.88	14.73	14.62	14.54	14.47
4	12.22	10.65	9.98	9.60	9.36	9.20	9.07	8.98	8.90
5	10.01	8.43	7.76	7.39	7.15	6.98	6.85	6.76	6.68
6	8.81	7.26	6.60	6.23	5.99	5.82	5.70	5.60	5.52
7	8.07	6.54	5.89	5.52	5.29	5.12	4.99	4.90	4.82
8	7.57	6.06	5.42	5.05	4.82	4.65	4.53	4.43	4.36
9	7.21	5.71	5.08	4.72	4.48	4.32	4.20	4.10	4.03
10	6.94	5.46	4.83	4.47	4.24	4.07	3.95	3.85	3.78
11	6.72	5.26	4.63	4.28	4.04	3.88	3.76	3.66	3.59
12	6.55	5.10	4.47	4.12	3.89	3.73	3.61	3.51	3.44
13	6.41	4.97	4.35	4.00	3.77	3.60	3.48	3.39	3.31
14	6.30	4.86	4.24	3.89	3.66	3.50	3.38	3.29	3.21
15	6.20	4.77	4.15	3.80	3.58	3.41	3.29	3.20	3.12
16	6.12	4.69	4.08	3.73	3.50	3.34	3.22	3.12	3.05
17	6.04	4.62	4.01	3.66	3.44	3.28	3.16	3.06	2.99
18	5.98	4.56	3.95	3.61	3.38	3.22	3.10	3.01	2.93
19	5.92	4.51	3.90	3.56	3.33	3.17	3.05	2.96	2.88
20	5.87	4.46	3.86	3.51	3.29	3.13	3.01	2.91	2.84
21	5.83	4.42	3.82	3.48	3.25	3.09	2.97	2.87	2.80
22	5.79	4.38	3.78	3.44	3.22	3.05	2.93	2.84	2.76
23	5.75	4.35	3.75	3.41	3.18	3.02	2.90	2.81	2.73
24	5.72	4.32	3.72	3.38	3.15	2.99	2.87	2.78	2.70
25	5.69	4.29	3.69	3.35	3.13	2.97	2.85	2.75	2.68
26	5.66	4.27	3.67	3.33	3.10	2.94	2.82	2.73	2.65
27	5.63	4.24	3.65	3.31	3.08	2.92	2.80	2.71	2.63
28	5.61	4.22	3.63	3.29	3.06	2.90	2.78	2.69	2.61
29	5.59	4.20	3.61	3.27	3.04	2.88	2.76	2.67	2.59
30	5.57	4.18	3.59	3.25	3.03	2.87	2.75	2.65	2.57
40	5.42	4.05	3.46	3.13	2.90	2.74	2.62	2.53	2.45
60	5.29	3.93	3.34	3.01	2.79	2.63	2.51	2.41	2.33
120	5.15	3.80	3.23	2.89	2.67	2.52	2.39	2.30	2.22
∞	5.02	3.69	3.12	2.79	2.57	2.41	2.29	2.19	2.11

TABLE A22 (Continued)

10	12	15	20	24	30	40	60	120	∞
968.6	976.7	984.9	993.1	997.2	1001	1006	1010	1014	1018
39.40	39.41	39.43	39.45	39.46	39.46	39.47	39.48	39.49	39.50
14.42	14.34	14.25	14.17	14.12	14.08	14.04	13.99	13.95	13.90
8.84	8.75	8.66	8.56	8.51	8.46	8.41	8.36	8.31	8.26
6.62	6.52	6.43	6.33	6.28	6.23	6.18	6.12	6.07	6.02
5.46	5.37	5.27	5.17	5.12	5.07	5.01	4.96	4.90	4.85
4.76	4.67	4.57	4.47	4.42	4.36	4.31	4.25	4.20	4.14
4.30	4.20	4.10	4.00	3.95	3.89	3.84	3.78	3.73	3.67
3.96	3.87	3.77	3.67	3.61	3.56	3.51	3.45	3.39	3.33
3.72	3.62	3.52	3.42	3.37	3.31	3.26	3.20	3.14	3.08
3.53	3.43	3.33	3.23	3.17	3.12	3.06	3.00	2.94	2.88
3.37	3.28	3.18	3.07	3.02	2.96	2.91	2.85	2.79	2.72
3.25	3.15	3.05	2.95	2.89	2.84	2.78	2.72	2.66	2.60
3.15	3.05	2.95	2.84	2.79	2.73	2.67	2.61	2.55	2.49
3.06	2.96	2.80	2.76	2.70	2.64	2.59	2.52	2.46	2.40
2.99	2.89	2.79	2.68	2.63	2.57	2.51	2.45	2.38	2.32
2.92	2.82	2.72	2.62	2.56	2.50	2.44	2.38	2.32	2.25
2.87	2.77	2.67	2.56	2.50	2.44	2.38	2.32	2.26	2.19
2.82	2.72	2.62	2.51	2.45	2.39	2.33	2.27	2.20	2.13
2.77	2.68	2.57	2.46	2.41	2.35	2.29	2.22	2.16	2.09
2.73	2.64	2.53	2.42	2.37	2.31	2.25	2.18	2.11	2.04
2.70	2.60	2.50	2.39	2.33	2.27	2.21	2.14	2.08	2.00
2.67	2.57	2.47	2.36	2.30	2.24	2.18	2.11	2.04	1.97
2.64	2.54	2.44	2.33	2.27	2.21	2.15	2.08	2.01	1.94
2.61	2.51	2.41	2.30	2.24	2.18	2.12	2.05	1.98	1.91
2.59	2.49	2.39	2.28	2.22	2.16	2.09	2.03	1.95	1.88
2.57	2.47	2.36	2.25	2.19	2.13	2.07	2.00	1.93	1.85
2.55	2.45	2.34	2.23	2.17	2.11	2.05	1.98	1.91	1.83
2.53	2.43	2.32	2.21	2.15	2.09	2.03	1.96	1.89	1.81
2.51	2.41	2.31	2.20	2.14	2.07	2.01	1.94	1.87	1.81
2.39	2.29	2.18	2.07	2.01	1.94	1.88	1.80	1.72	1.64
2.27	2.17	2.06	1.94	1.88	1.82	1.74	1.67	1.58	1.48
2.16	2.05	1.94	1.82	1.76	1.69	1.61	1.53	1.43	1.31
2.05	1.94	1.83	1.71	1.64	1.57	1.48	1.39	1.27	1.00

TABLE A22 (Continued)

k_1	10	12	15	20	24	30	40	60	120	∞
k_2										
1	6056	6106	6157	6209	6235	6261	6287	6313	6339	6366
2	99.40	99.42	99.43	99.45	99.46	99.47	99.47	99.48	99.49	99.50
3	27.23	27.05	26.87	26.69	26.60	26.50	26.41	26.32	26.22	26.13
4	14.55	14.37	14.20	14.02	13.93	13.84	13.75	13.65	13.56	13.46
5	10.05	9.89	9.72	9.55	9.47	9.38	9.29	9.20	9.11	9.02
6	7.87	7.72	7.56	7.40	7.31	7.23	7.14	7.06	6.97	6.88
7	6.62	6.47	6.31	6.16	6.07	5.99	5.91	5.82	5.74	5.65
8	5.81	5.67	5.52	5.36	5.28	5.20	5.12	5.03	4.95	4.86
9	5.26	5.11	4.96	4.81	4.73	4.65	4.57	4.48	4.40	4.31
10	4.85	4.71	4.56	4.41	4.33	4.25	4.17	4.08	4.00	3.91
11	4.54	4.40	4.25	4.10	4.02	3.94	3.86	3.78	3.69	3.60
12	4.30	4.16	4.01	3.86	3.78	3.70	3.62	3.54	3.45	3.36
13	4.10	3.96	3.82	3.66	3.59	3.51	3.43	3.34	3.25	3.17
14	3.94	3.80	3.66	3.51	3.43	3.35	3.27	3.18	3.09	3.00
15	3.80	3.67	3.52	3.37	3.29	3.21	3.13	3.05	2.96	2.87
16	3.69	3.55	3.41	3.26	3.18	3.10	3.02	2.93	2.84	2.75
17	3.59	3.46	3.31	3.16	3.08	3.00	2.92	2.83	2.75	2.65
18	3.51	3.37	3.23	3.08	3.00	2.92	2.84	2.75	2.66	2.57
19	3.43	3.30	3.15	3.00	2.92	2.84	2.76	2.67	2.58	2.49
20	3.37	3.23	3.09	2.94	2.86	2.78	2.69	2.61	2.52	2.42
21	3.31	3.17	3.03	2.88	2.80	2.72	2.64	2.55	2.46	2.36
22	3.26	3.12	2.98	2.83	2.75	2.67	2.58	2.50	2.40	2.31
23	3.21	3.07	2.93	2.78	2.70	2.62	2.54	2.45	2.35	2.26
24	3.17	3.03	2.89	2.74	2.66	2.58	2.49	2.40	2.31	2.21
25	3.13	2.99	2.85	2.70	2.62	2.54	2.45	2.36	2.27	2.17
26	3.09	2.96	2.81	2.66	2.58	2.50	2.42	2.33	2.23	2.13
27	3.06	2.93	2.78	2.63	2.55	2.47	2.38	2.29	2.20	2.10
28	3.03	2.90	2.75	2.60	2.52	2.44	2.35	2.26	2.17	2.06
29	3.00	2.87	2.73	2.57	2.49	2.41	2.33	2.23	2.14	2.03
30	2.98	2.84	2.70	2.55	2.47	2.39	2.30	2.21	2.11	2.01
31	2.80	2.66	2.52	2.37	2.29	2.20	2.11	2.02	1.92	1.80
32	2.63	2.50	2.35	2.20	2.12	2.03	1.94	1.84	1.73	1.60
33	2.47	2.34	2.19	2.03	1.95	1.86	1.76	1.66	1.53	1.38
34	2.32	2.18	2.04	1.88	1.79	1.70	1.59	1.47	1.32	1.00

TABLE A22 (Continued) (0.99 Quantiles)

k_1	1	2	3	4	5	6	7	8	9
k_2									
1	4052	4999.5	5403	5625	5764	5859	5928	5981	6022
2	98.50	99.00	99.17	99.25	99.30	99.33	99.36	99.37	99.39
3	34.12	30.82	29.46	28.71	28.24	27.91	27.67	27.49	27.35
4	21.20	18.00	16.69	15.98	15.52	15.21	14.98	14.80	14.66
5	16.26	13.27	12.06	11.39	10.97	10.67	10.46	10.29	10.16
6	13.75	10.92	9.78	9.15	8.75	8.47	8.26	8.10	7.98
7	12.25	9.55	8.45	7.85	7.46	7.19	6.99	6.84	6.72
8	11.26	8.65	7.59	7.01	6.63	6.37	6.18	6.03	5.91
9	10.56	8.02	6.99	6.42	6.06	5.80	5.61	5.47	5.35
10	10.04	7.56	6.55	5.99	5.64	5.39	5.20	5.06	4.94
11	9.65	7.21	6.22	5.67	5.32	5.07	4.89	4.74	4.63
12	9.33	6.93	5.95	5.41	5.06	4.82	4.64	4.50	4.39
13	9.07	6.70	5.74	5.21	4.86	4.62	4.44	4.30	4.19
14	8.86	6.51	5.56	5.04	4.69	4.46	4.28	4.14	4.03
15	8.68	6.36	5.42	4.89	4.56	4.32	4.14	4.00	3.89
16	8.53	6.23	5.29	4.77	4.44	4.20	4.03	3.89	3.78
17	8.40	6.11	5.18	4.67	4.34	4.10	3.93	3.79	3.68
18	8.29	6.01	5.09	4.58	4.25	4.01	3.84	3.71	3.60
19	8.18	5.93	5.01	4.50	4.17	3.94	3.77	3.63	3.52
20	8.10	5.85	4.94	4.43	4.10	3.87	3.70	3.56	3.46
21	8.02	5.78	4.87	4.37	4.04	3.81	3.64	3.51	3.40
22	7.95	5.72	4.82	4.31	3.99	3.76	3.59	3.45	3.35
23	7.88	5.66	4.76	4.26	3.94	3.71	3.54	3.41	3.30
24	7.82	5.61	4.72	4.22	3.90	3.67	3.50	3.36	3.26
25	7.77	5.57	4.68	4.18	3.85	3.63	3.46	3.32	3.22
26	7.72	5.53	4.64	4.14	3.82	3.59	3.42	3.29	3.18
27	7.68	5.49	4.60	4.11	3.78	3.56	3.39	3.26	3.15
28	7.64	5.45	4.57	4.07	3.75	3.53	3.36	3.23	3.12
29	7.60	5.42	4.54	4.04	3.73	3.50	3.33	3.20	3.09
30	7.56	5.39	4.51	4.02	3.70	3.47	3.30	3.17	3.07
31	7.51	5.35	4.43	3.83	3.51	3.29	3.12	2.99	2.89
32	7.47	5.31	4.31	3.65	3.34	3.12	2.95	2.82	2.72
33	7.43	5.27	4.23	3.48	3.17	2.96	2.79	2.66	2.56
34	7.39	5.23	4.19	3.32	3.02	2.80	2.64	2.51	2.41