Appendix of Tables

SOURCE OF TABLES

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Table A Normal Distribution

Each table entry is the tail probability P, right tail from the value of z to plus infinity, and also left tail from minus infinity to $-z$, for all $P \leqslant .50$. Read down the first column to the first decimal value of z, and over to the correct column for the second decimal value; the number at the intersection is P.

z	*.00*	*.01*	*.02*	*.03*	*.04*	*.05*	*.06*	*.07*	*.08*	*0.9*
0.0	.5000	.4960	.4920	.4880	.4840	.4801	.4761	.4721	.4681	.4641
0.1	.4602	.4562	.4522	.4483	.4443	.4404	.4364	.4325	.4286	.4247
0.2	.4207	.4168	.4129	.4090	.4052	.4013	.3974	.3936	.3897	.3859
0.3	.3821	.3783	.3745	.3707	.3669	.3632	.3594	.3557	.3520	.3483
0.4	.3446	.3409	.3372	.3336	.3300	.3264	.3228	.3192	.3156	.3121
0.5	.3085	.3050	.3015	.2981	.2946	.2912	.2877	.2843	.2810	.2776
0.6	.2743	.2709	.2676	.2643	.2611	.2578	.2546	.2514	.2483	.2451
0.7	.2420	.2389	.2358	.2327	.2296	.2266	.2236	.2206	.2177	.2148
0.8	.2119	.2090	.2061	.2033	.2005	.1977	.1949	.1922	.1894	.1867
0.9	.1841	.1814	.1788	.1762	.1736	.1711	.1685	.1660	.1635	.1611
1.0	.1587	.1562	.1539	.1515	.1492	.1469	.1446	.1423	.1401	.1379
1.1	.1357	.1335	.1314	.1292	.1271	.1251	.1230	.1210	.1190	.1170
1.2	.1151	.1131	.1112	.1093	.1075	.1056	.1038	.1020	.1003	.0985
1.3	.0968	.0951	.0934	.0918	.0901	.0885	.0869	.0853	.0838	.0823
1.4	.0808	.0793	.0778	.0764	.0749	.0735	.0721	.0708	.0694	.0681
1.5	.0668	.0655	.0643	.0630	.0618	.0606	.0594	.0582	.0571	.0559
1.6	.0548	.0537	.0526	.0516	.0505	.0495	.0485	.0475	.0465	.0455
1.7	.0446	.0436	.0427	.0418	.0409	.0401	.0392	.0384	.0375	.0367
1.8	.0359	.0351	.0344	.0336	.0329	.0322	.0314	.0307	.0301	.0294
1.9	.0287	.0281	.0274	.0268	.0262	.0256	.0250	.0244	.0239	.0233
2.0	.0228	.0222	.0217	.0212	.0207	.0202	.0197	.0192	.0188	.0183
2.1	.0179	.0174	.0170	.0166	.0162	.0158	.0154	.0150	.0146	.0143
2.2	.0139	.0136	.0132	.0129	.0125	.0122	.0119	.0116	.0113	.0110
2.3	.0107	.0104	.0102	.0099	.0096	.0094	.0091	.0089	.0087	.0084
2.4	.0082	.0080	.0078	.0075	.0073	.0071	.0069	.0068	.0066	.0064
2.5	.0062	.0060	.0059	.0057	.0055	.0054	.0052	.0051	.0049	.0048
2.6	.0047	.0045	.0044	.0043	.0041	.0040	.0039	.0038	.0037	.0036
2.7	.0035	.0034	.0033	.0032	.0031	.0030	.0029	.0028	.0027	.0026
2.8	.0026	.0025	.0024	.0023	.0023	.0022	.0021	.0021	.0020	.0019
2.9	.0019	.0018	.0018	.0017	.0016	.0016	.0015	.0015	.0014	.0014
3.0	.0013	.0013	.0013	.0012	.0012	.0011	.0011	.0011	.0010	.0010
3.1	.0010	.0009	.0009	.0009	.0008	.0008	.0008	.0008	.0007	.0007
3.2	.0007	.0007	.0006	.0006	.0006	.0006	.0006	.0005	.0005	.0005
3.3	.0005	.0005	.0005	.0004	.0004	.0004	.0004	.0004	.0004	.0003
3.4	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0002
3.5	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002

Source: Adapted from Table 1 of Pearson, E. S., and H. O. Hartley, eds. (1954), *Biometrika Tables for Statisticians*, vol. 1, Cambridge University Press, Cambridge, England, with permission of the Biometrika Trustees.

Table B Chi-Square Distribution

Each table entry is the value of a chi-square random variable with v degrees of freedom such that its right-tail probability is the value given on the top row.

	Right-tail probability								
v	*0.95*	*0.90*	*0.50*	*0.25*	*0.10*	*0.05*	*0.01*	*0.005*	*0.001*
1	0.004	0.016	0.45	1.32	2.71	3.84	6.63	7.88	10.83
2	0.10	0.21	1.39	2.77	4.61	5.99	9.21	10.60	13.82
3	0.35	0.58	2.37	4.11	6.25	7.81	11.34	12.84	16.27
4	0.71	1.06	3.36	5.39	7.78	9.49	13.28	14.86	18.47
5	1.15	1.61	4.35	6.63	9.24	11.07	15.09	16.75	20.52
6	1.64	2.20	5.35	7.84	10.64	12.59	16.81	18.55	22.46
7	2.17	2.83	6.35	9.04	12.02	14.07	18.48	20.28	24.32
8	2.73	3.49	7.34	10.22	12.36	15.51	20.09	21.96	26.12
9	3.33	4.17	8.34	11.39	14.68	16.92	21.67	23.59	27.88
10	3.94	4.87	9.34	12.55	15.99	18.31	23.21	25.19	29.59
11	4.57	5.58	10.34	13.70	17.28	19.68	24.72	26.76	31.26
12	5.23	6.30	11.34	14.85	18.55	21.03	26.22	28.30	32.91
13	5.89	7.04	12.34	15.98	19.81	22.36	27.69	29.82	34.53
14	6.57	7.79	13.34	17.12	21.06	23.68	29.14	31.32	36.12
15	7.26	8.55	14.34	18.25	22.31	25.00	30.58	32.80	37.70
16	7.96	9.31	15.34	19.37	23.54	26.30	32.00	34.27	39.25
17	8.67	10.09	16.34	20.49	24.77	27.59	33.41	35.72	40.79
18	9.39	10.86	17.34	21.60	25.99	28.87	34.81	37.16	42.31
19	10.12	11.65	18.34	22.72	27.20	30.14	36.19	38.58	43.82
20	10.85	12.44	19.34	23.83	28.41	31.41	37.57	40.00	45.32
21	11.59	13.24	20.34	24.93	29.62	32.67	38.93	41.40	46.80
22	12.34	14.04	21.34	26.04	30.81	33.92	40.29	42.80	48.27
23	13.09	14.85	22.34	27.14	32.01	35.17	41.64	44.18	49.73
24	13.85	15.66	23.34	28.24	33.20	36.42	42.98	45.56	51.18
25	14.61	16.47	24.34	29.34	34.38	37.65	44.31	46.93	52.62
26	15.38	17.29	25.34	30.43	35.56	38.89	45.64	48.29	54.05
27	16.15	18.11	26.34	31.53	36.74	40.11	46.96	49.64	55.48
28	16.93	18.94	27.34	32.62	37.92	41.34	48.28	50.99	56.89
29	17.71	19.77	28.34	33.71	39.09	42.56	49.59	52.34	58.30
30	18.49	20.60	29.34	34.80	40.26	43.77	50.89	53.67	59.70

For $v > 30$, a right-tail or left-tail probability for Q a chi-square variable can be found from Table A with Z where $Z = \sqrt{2Q} - \sqrt{2v - 1}$.

Source: Adapted from Table 8 of Pearson, E. S. and H. O. Hartley, eds. (1954), *Biometrika Tables for Statisticians*, vol. 1, Cambridge University Press, Cambridge, England, with permission of the Biometrika Trustees.

Table C Cumulative Binomial Distribution

Each table entry is the left-tail probability of x or less successes in n Bernoulli trials where θ is the probability of a success on each trial.

		θ								
n	x	*.05*	*.10*	*.15*	*.20*	*.25*	*.30*	*.35*	*.40*	*.45*
1	0	.9500	.9000	.8500	.8000	.7500	.7000	.6500	.6000	.5500
	1	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
2	0	.9025	.8100	.7225	.6400	.5625	.4900	.4225	.3600	.3025
	1	.9975	.9900	.9775	.9600	.9375	.9100	.8775	.8400	.7975
	2	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
3	0	.8574	.7290	.6141	.5120	.4219	.3430	.2746	.2160	.1664
	1	.9928	.9720	.9392	.8960	.8438	.7840	.7182	.6480	.5748
	2	.9999	.9990	.9966	.9920	.9844	.9730	.9561	.9360	.9089
	3	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
4	0	.8145	.6561	.5220	.4096	.3164	.2401	.1785	.1296	.0915
	1	.9860	.9477	.8905	.8192	.7383	.6517	.5630	.4752	.3910
	2	.9995	.9963	.9880	.9728	.9492	.9163	.8735	.8208	.7585
	3	1.0000	.9999	.9995	.9984	.9961	.9919	.9850	.9744	.9590
	4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
5	0	.7738	.5905	.4437	.3277	.2373	.1681	.1160	.0778	.0503
	1	.9774	.9185	.8352	.7373	.6328	.5282	.4284	.3370	.2562
	2	.9988	.9914	.9734	.9421	.8965	.8369	.7648	.6826	.5931
	3	1.0000	.9995	.9978	.9933	.9844	.9692	.9460	.9130	.8688
	4	1.0000	1.0000	.9999	.9997	.9990	.9976	.9947	.9898	.9815
	5	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
6	0	.7351	.5314	.3771	.2621	.1780	.1176	.0754	.0467	.0277
	1	.9672	.8857	.7765	.6554	.5339	.4202	.3191	.2333	.1636
	2	.9978	.9842	.9527	.9011	.8306	.7443	.6471	.5443	.4415
	3	.9999	.9987	.9941	.9830	.9624	.9295	.8826	.8208	.7447
	4	1.0000	.9999	.9996	.9984	.9954	.9891	.9777	.9590	.9308
	5	1.0000	1.0000	1.0000	.9999	.9998	.9993	.9982	.9959	.9917
	6	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
7	0	.6983	.4783	.3206	.2097	.1335	.0824	.0490	.0280	.0152
	1	.9556	.8503	.7166	.5767	.4449	.3294	.2338	.1586	.1024
	2	.9962	.9743	.9262	.8520	.7564	.6471	.5323	.4199	.3164
	3	.9998	.9973	.9879	.9667	.9294	.8740	.8002	.7102	.6083
	4	1.0000	.9998	.9988	.9953	.9871	.9712	.9444	.9037	.8471
	5	1.0000	1.0000	.9999	.9996	.9987	.9962	.9910	.9812	.9643
	6	1.0000	1.0000	1.0000	1.0000	.9999	.9998	.9994	.9984	.9963
	7	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

(*Continued*)

Table C (*Continued*)

		θ									
n	*x*	*.50*	*.55*	*.60*	*.65*	*.70*	*.75*	*.80*	*.85*	*.90*	*.95*
1	0	.5000	.4500	.4000	.3500	.3000	.2500	.2000	.1500	.1000	.0500
	1	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
2	0	.2500	.2025	.1600	.1225	.0900	.0625	.0400	.0225	.0100	.0025
	1	.7500	.6975	.6400	.5775	.5100	.4375	.3600	.2775	.1900	.0975
	2	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
3	0	.1250	.0911	.0640	.0429	.0270	.0156	.0080	.0034	.0010	.0001
	1	.5000	.4252	.3520	.2818	.2160	.1562	.1040	.0608	.0280	.0072
	2	.8750	.8336	.7840	.7254	.6570	.5781	.4880	.3859	.2710	.1426
	3	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
4	0	.0625	.0410	.0256	.0150	.0081	.0039	.0016	.0005	.0001	.0000
	1	.3125	.2415	.1792	.1265	.0837	.0508	.0272	.0120	.0037	.0005
	2	.6875	.6090	.5248	.4370	.3483	.2617	.1808	.1095	.0523	.0140
	3	.9375	.9085	.8704	.8215	.7599	.6836	.5904	.4780	.3439	.1855
	4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
5	0	.0312	.0185	.0102	.0053	.0024	.0010	.0003	.0001	.0000	.0000
	1	.1875	.1312	.0870	.0540	.0308	.0156	.0067	.0022	.0005	.0000
	2	.5000	.4069	.3174	.2352	.1631	.1035	.0579	.0266	.0086	.0012
	3	.8125	.7438	.6630	.5716	.4718	.3672	.2627	.1648	.0815	.0226
	4	.9688	.9497	.9222	.8840	.8319	.7627	.6723	.5563	.4095	.2262
	5	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
6	0	.0156	.0083	.0041	.0018	.0007	.0002	.0001	.0000	.0000	.0000
	1	.1094	.0692	.0410	.0223	.0109	.0046	.0016	.0004	.0001	.0000
	2	.3438	.2553	.1792	.1174	.0705	.0376	.0170	.0059	.0013	.0001
	3	.6562	.5585	.4557	.3529	.2557	.1694	.0989	.0473	.0158	.0022
	4	.8906	.8364	.7667	.6809	.5798	.4661	.3446	.2235	.1143	.0328
	5	.9844	.9723	.9533	.9246	.8824	.8220	.7379	.6229	.4686	.2649
	6	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
7	0	.0078	.0037	.0016	.0006	.0002	.0001	.0000	.0000	.0000	.0000
	1	.0625	.0357	.0188	.0090	.0038	.0013	.0004	.0001	.0000	.0000
	2	.2266	.1529	.0963	.0556	.0288	.0129	.0047	.0012	.0002	.0000
	3	.5000	.3917	.2898	.1998	.1260	.0706	.0333	.0121	.0027	.0002
	4	.7734	.6836	.5801	.4677	.3529	.2436	.1480	.0738	.0257	.0038
	5	.9375	.8976	.8414	.7662	.6706	.5551	.4233	.2834	.1497	.0444
	6	.9922	.9848	.9720	.9510	.9176	.8665	.7903	.6794	.5217	.3017
	7	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

(*Continued*)

Table C (*Continued*)

		θ								
n	*x*	*.05*	*.10*	*.15*	*.20*	*.25*	*.30*	*.35*	*.40*	*.45*
8	0	.6634	.4305	.2725	.1678	.1001	.0576	.0319	.0168	.0084
	1	.9428	.8131	.6572	.5033	.3671	.2553	.1691	.1064	.0632
	2	.9942	.9619	.8948	.7969	.6785	.5518	.4278	.3154	.2201
	3	.9996	.9950	.9786	.9437	.8862	.8059	.7064	.5941	.4770
	4	1.0000	.9996	.9971	.9896	.9727	.9420	.8939	.8263	.7396
	5	1.0000	1.0000	.9998	.9988	.9958	.9887	.9747	.9502	.9115
	6	1.0000	1.0000	1.0000	.9999	.9996	.9987	.9964	.9915	.9819
	7	1.0000	1.0000	1.0000	1.0000	1.0000	.9999	.9998	.9993	.9983
	8	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
9	0	.6302	.3874	.2316	.1342	.0751	.0404	.0207	.0101	.0046
	1	.9288	.7748	.5995	.4362	.3003	.1960	.1211	.0705	.0385
	2	.9916	.9470	.8591	.7382	.6007	.4628	.3373	.2318	.1495
	3	.9994	.9917	.9661	.9144	.8343	.7297	.6089	.4826	.3614
	4	1.0000	.9991	.9944	.9804	.9511	.9012	.8283	.7334	.6214
	5	1.0000	.9999	.9994	.9969	.9900	.9747	.9464	.9006	.8342
	6	1.0000	1.0000	1.0000	.9997	.9987	.9957	.9888	.9750	.9502
	7	1.0000	1.0000	1.0000	1.0000	.9999	.9996	.9986	.9962	.9909
	8	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	.9999	.9997	.9992
	9	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
10	0	.5987	.3487	.1969	.1074	.0563	.0282	.0135	.0060	.0025
	1	.9139	.7361	.5443	.3758	.2440	.1493	.0860	.0464	.0233
	2	.9885	.9298	.8202	.6778	.5256	.3828	.2616	.1673	.0996
	3	.9990	.9872	.9500	.8791	.7759	.6496	.5138	.3823	.2660
	4	.9999	.9984	.9901	.9672	.9219	.8497	.7515	.6331	.5044
	5	1.0000	.9999	.9986	.9936	.9803	.9527	.9051	.8338	.7384
	6	1.0000	1.0000	.9999	.9991	.9965	.9894	.9740	.9452	.8980
	7	1.0000	1.0000	1.0000	.9999	.9996	.9984	.9952	.9877	.9726
	8	1.0000	1.0000	1.0000	1.0000	1.0000	.9999	.9995	.9983	.9955
	9	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	.9999	.9997
	10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
11	0	.5688	.3138	.1673	.0859	.0422	.0198	.0088	.0036	.0014
	1	.8981	.6974	.4922	.3221	.1971	.1130	.0606	.0302	.0139
	2	.9848	.9104	.7788	.6174	.4552	.3127	.2001	.1189	.0652
	3	.9984	.9815	.9306	.8389	.7133	.5696	.4256	.2963	.1911
	4	.9999	.9972	.9841	.9496	.8854	.7897	.6683	.5328	.3971
	5	1.0000	.9997	.9973	.9883	.9657	.9218	.8513	.7535	.6331
	6	1.0000	1.0000	.9997	.9980	.9924	.9784	.9499	.9006	.8262
	7	1.0000	1.0000	1.0000	.9998	.9988	.9957	.9878	.9707	.9390
	8	1.0000	1.0000	1.0000	1.0000	.9999	.9994	.9980	.9941	.9852
	9	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	.9998	.9993	.9978
	10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	.9998
	11	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

(*Continued*)

Table C (*Continued*)

		θ									
n	*x*	*.50*	*.55*	*.60*	*.65*	*.70*	*.75*	*.80*	*.85*	*.90*	*.95*
8	0	.0039	.0017	.0007	.0002	.0001	.0000	.0000	.0000	.0000	.0000
	1	.0352	.0181	.0085	.0036	.0013	.0004	.0001	.0000	.0000	.0000
	2	.1445	.0885	.0498	.0253	.0113	.0042	.0012	.0002	.0000	.0000
	3	.3633	.2604	.1737	.1061	.0580	.0273	.0104	.0029	.0004	.0000
	4	.6367	.5230	.4059	.2936	.1941	.1138	.0563	.0214	.0050	.0004
	5	.8555	.7799	.6846	.5722	.4482	.3215	.2031	.1052	.0381	.0058
	6	.9648	.9368	.8936	.8309	.7447	.6329	.4967	.3428	.1869	.0572
	7	.9961	.9916	.9832	.9681	.9424	.8999	.8322	.7275	.5695	.3366
	8	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
9	0	.0020	.0008	.0003	.0001	.0000	.0000	.0000	.0000	.0000	.0000
	1	.0195	.0091	.0038	.0014	.0004	.0001	.0000	.0000	.0000	.0000
	2	.0898	.0498	.0250	.0112	.0043	.0013	.0003	.0000	.0000	.0000
	3	.2539	.1658	.0994	.0536	.0253	.0100	.0031	.0006	.0001	.0000
	4	.5000	.3786	.2666	.1717	.0988	.0489	.0196	.0056	.0009	.0000
	5	.7461	.6386	.5174	.3911	.2703	.1657	.0856	.0339	.0083	.0006
	6	.9102	.8505	.7682	.6627	.5372	.3993	.2618	.1409	.0530	.0084
	7	.9805	.9615	.9295	.8789	.8040	.6997	.5638	.4005	.2252	.0712
	8	.9980	.9954	.9899	.9793	.9596	.9249	.8658	.7684	.6126	.3698
	9	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
10	0	.0010	.0003	.0001	.0000	.0000	.0000	.0000	.0000	.0000	.0000
	1	.0107	.0045	.0017	.0005	.0001	.0000	.0000	.0000	.0000	.0000
	2	.0547	.0274	.0123	.0048	.0016	.0004	.0001	.0000	.0000	.0000
	3	.1719	.1020	.0548	.0260	.0106	.0035	.0009	.0001	.0000	.0000
	4	.3770	.2616	.1662	.0949	.0473	.0197	.0064	.0014	.0001	.0000
	5	.6230	.4956	.3669	.2485	.1503	.0781	.0328	.0099	.0016	.0001
	6	.8281	.7340	.6177	.4862	.3504	.2241	.1209	.0500	.0128	.0010
	7	.9453	.9004	.8327	.7384	.6172	.4744	.3222	.1798	.0702	.0115
	8	.9893	.9767	.9536	.9140	.8507	.7560	.6242	.4557	.2639	.0861
	9	.9990	.9975	.9940	.9865	.9718	.9437	.8926	.8031	.6513	.4013
	10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
11	0	.0005	.0002	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
	1	.0059	.0022	.0007	.0002	.0000	.0000	.0000	.0000	.0000	.0000
	2	.0327	.0148	.0059	.0020	.0006	.0001	.0000	.0000	.0000	.0000
	3	.1133	.0610	.0293	.0122	.0043	.0012	.0002	.0000	.0000	.0000
	4	.2744	.1738	.0994	.0501	.0216	.0076	.0020	.0003	.0000	.0000
	5	.5000	.3669	.2465	.1487	.0782	.0343	.0117	.0027	.0003	.0000
	6	.7256	.6029	.4672	.3317	.2103	.1146	.0504	.0159	.0028	.0001
	7	.8867	.8089	.7037	.5744	.4304	.2867	.1611	.0694	.0185	.0016
	8	.9673	.9348	.8811	.7999	.6873	.5448	.3826	.2212	.0896	.0152
	9	.9941	.9861	.9698	.9394	.8870	.8029	.6779	.5078	.3026	.1019
	10	.9995	.9986	.9964	.9912	.9802	.9578	.9141	.8327	.6862	.4312
	11	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

(*Continued*)

Table C (*Continued*)

		θ								
n	*x*	*.05*	*.10*	*.15*	*.20*	*.25*	*.30*	*.35*	*.40*	*.45*
12	0	.5404	.2824	.1422	.0687	.0317	.0138	.0057	.0022	.0008
	1	.8816	.6590	.4435	.2749	.1584	.0850	.0424	.0196	.0083
	2	.9804	.8891	.7358	.5583	.3907	.2528	.1513	.0834	.0421
	3	.9978	.9744	.9078	.7946	.6488	.4925	.3467	.2253	.1345
	4	.9998	.9957	.9761	.9274	.8424	.7237	.5833	.4382	.3044
	5	1.0000	.9995	.9954	.9806	.9456	.8822	.7873	.6652	.5269
	6	1.0000	.9999	.9993	.9961	.9857	.9614	.9154	.8418	.7393
	7	1.0000	1.0000	.9999	.9994	.9972	.9905	.9745	.9427	.8883
	8	1.0000	1.0000	1.0000	.9999	.9996	.9983	.9944	.9847	.9644
	9	1.0000	1.0000	1.0000	1.0000	1.0000	.9998	.9992	.9972	.9921
	10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	.9999	.9997	.9989
	11	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	.9999
	12	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
13	0	.5133	.2542	.1209	.0550	.0238	.0097	.0037	.0013	.0004
	1	.8646	.6213	.3983	.2336	.1267	.0637	.0296	.0126	.0049
	2	.9755	.8661	.7296	.5017	.3326	.2025	.1132	.0579	.0269
	3	.9969	.9658	.9033	.7473	.5843	.4206	.2783	.1686	.0929
	4	.9997	.9935	.9740	.9009	.7940	.6543	.5005	.3530	.2279
	5	1.0000	.9991	.9947	.9700	.9198	.8346	.7159	.5744	.4268
	6	1.0000	.9999	.9987	.9930	.9757	.9376	.8705	.7712	.6437
	7	1.0000	1.0000	.9998	.9988	.9944	.9818	.9538	.9023	.8212
	8	1.0000	1.0000	1.0000	.9998	.9990	.9960	.9874	.9679	.9302
	9	1.0000	1.0000	1.0000	1.0000	.9999	.9993	.9975	.9922	.9797
	10	1.0000	1.0000	1.0000	1.0000	1.0000	.9999	.9997	.9987	.9959
	11	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	.9999	.9995
	12	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
	13	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
14	0	.4877	.2288	.1028	.0440	.0178	.0068	.0024	.0008	.0002
	1	.8470	.5846	.3567	.1979	.1010	.0475	.0205	.0081	.0029
	2	.9699	.8416	.6479	.4481	.2811	.1608	.0839	.0398	.0170
	3	.9958	.9559	.8535	.6982	.5213	.3552	.2205	.1243	.0632
	4	.9996	.9908	.9533	.8702	.7415	.5842	.4227	.2793	.1672
	5	1.0000	.9985	.9885	.9561	.8883	.7805	.6405	.4859	.3373
	6	1.0000	.9998	.9978	.9884	.9617	.9067	.8164	.6925	.5461
	7	1.0000	1.0000	.9997	.9976	.9897	.9685	.9247	.8499	.7414
	8	1.0000	1.0000	1.0000	.9996	.9978	.9917	.9757	.9417	.8811
	9	1.0000	1.0000	1.0000	1.0000	.9997	.9983	.9940	.9825	.9574
	10	1.0000	1.0000	1.0000	1.0000	1.0000	.9998	.9989	.9961	.9886
	11	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	.9999	.9994	.9978
	12	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	.9999	.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

(*Continued*)

Table C (*Continued*)

		θ									
n	*x*	*.50*	*.55*	*.60*	*.65*	*.70*	*.75*	*.80*	*.85*	*.90*	*.95*
12	0	.0002	.0001	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
	1	.0032	.0011	.0003	.0001	.0000	.0000	.0000	.0000	.0000	.0000
	2	.0193	.0079	.0028	.0008	.0002	.0000	.0000	.0000	.0000	.0000
	3	.0730	.0356	.0153	.0056	.0017	.0004	.0001	.0000	.0000	.0000
	4	.1938	.1117	.0573	.0255	.0095	.0028	.0006	.0001	.0000	.0000
	5	.3872	.2607	.1582	.0846	.0386	.0143	.0039	.0007	.0001	.0000
	6	.6128	.4731	.3348	.2127	.1178	.0544	.0194	.0046	.0005	.0000
	7	.8062	.6956	.5618	.4167	.2763	.1576	.0726	.0239	.0043	.0002
	8	.9270	.8655	.7747	.6533	.5075	.3512	.2054	.0922	.0256	.0022
	9	.9807	.9579	.9166	.8487	.7472	.6093	.4417	.2642	.1109	.0196
	10	.9968	.9917	.9804	.9576	.9150	.8416	.7251	.5565	.3410	.1184
	11	.9998	.9992	.9978	.9943	.9862	.9683	.9313	.8578	.7176	.4596
	12	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
13	0	.0001	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
	1	.0017	.0005	.0001	.0000	.0000	.0000	.0000	.0000	.0000	.0000
	2	.0112	.0041	.0013	.0003	.0001	.0000	.0000	.0000	.0000	.0000
	3	.0461	.0203	.0078	.0025	.0007	.0001	.0000	.0000	.0000	.0000
	4	.1334	.0698	.0321	.0126	.0040	.0010	.0002	.0000	.0000	.0000
	5	.2905	.1788	.0977	.0462	.0182	.0056	.0012	.0002	.0000	.0000
	6	.5000	.3563	.2288	.1295	.0624	.0243	.0070	.0013	.0001	.0000
	7	.7095	.5732	.4256	.2841	.1654	.0802	.0300	.0053	.0009	.0000
	8	.8666	.7721	.6470	.4995	.3457	.2060	.0991	.0260	.0065	.0003
	9	.9539	.9071	.8314	.7217	.5794	.4157	.2527	.0967	.0342	.0031
	10	.9888	.9731	.9421	.8868	.7975	.6674	.4983	.2704	.1339	.0245
	11	.9983	.9951	.9874	.9704	.9363	.8733	.7664	.6017	.3787	.1354
	12	.9999	.9996	.9987	.9963	.9903	.9762	.9450	.8791	.7458	.4867
	13	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
14	0	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
	1	.0009	.0003	.0001	.0000	.0000	.0000	.0000	.0000	.0000	.0000
	2	.0065	.0022	.0006	.0001	.0000	.0000	.0000	.0000	.0000	.0000
	3	.0287	.0114	.0039	.0011	.0002	.0000	.0000	.0000	.0000	.0000
	4	.0898	.0462	.0175	.0060	.0017	.0003	.0000	.0000	.0000	.0000
	5	.2120	.1189	.0583	.0243	.0083	.0022	.0004	.0000	.0000	.0000
	6	.3953	.2586	.1501	.0753	.0315	.0103	.0024	.0003	.0000	.0000
	7	.6047	.4539	.3075	.1836	.0933	.0383	.0116	.0022	.0002	.0000
	8	.7880	.6627	.5141	.3595	.2195	.1117	.0439	.0115	.0015	.0000
	9	.9102	.8328	.7207	.5773	.4158	.2585	.1298	.0467	.0092	.0004
	10	.9713	.9368	.8757	.7795	.6448	.4787	.3018	.1465	.0441	.0042
	11	.9935	.9830	.9602	.9161	.8392	.7189	.5519	.3521	.1584	.0301
	12	.9991	.9971	.9919	.9795	.9525	.8990	.8021	.6433	.4154	.1530
	13	.9999	.9998	.9992	.9976	.9932	.9822	.9560	.8972	.7712	.5123
	14	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

(*Continued*)

Table C (*Continued*)

		θ								
n	*x*	*.05*	*.10*	*.15*	*.20*	*.25*	*.30*	*.35*	*.40*	*.45*
15	0	.4633	.2059	.0874	.0352	.0134	.0047	.0016	.0005	.0001
	1	.8290	.5490	.3186	.1671	.0802	.0353	.0142	.0052	.0017
	2	.9638	.8159	.6042	.3980	.2361	.1268	.0617	.0271	.0107
	3	.9945	.9444	.8227	.6482	.4613	.2969	.1727	.0905	.0424
	4	.9994	.9873	.9383	.8358	.6865	.5155	.3519	.2173	.1204
	5	.9999	.9978	.9832	.9389	.8516	.7216	.5643	.4032	.2608
	6	1.0000	.9997	.9964	.9819	.9434	.8689	.7548	.6098	.4522
	7	1.0000	1.0000	.9994	.9958	.9927	.9500	.8868	.7869	.6535
	8	1.0000	1.0000	.9999	.9992	.9958	.9848	.9578	.9050	.8182
	9	1.0000	1.0000	1.0000	.9999	.9992	.9963	.9876	.9662	.9231
	10	1.0000	1.0000	1.0000	1.0000	.9999	.9993	.9972	.9907	.9745
	11	1.0000	1.0000	1.0000	1.0000	1.0000	.9999	.9995	.9981	.9937
	12	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	.9999	.9997	.9989
	13	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	.9999
	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	0	.4401	.1853	.0743	.0281	.0100	.0033	.0010	.0003	.0001
	1	.8108	.5147	.2839	.1407	.0635	.0261	.0098	.0033	.0010
	2	.9571	.7892	.5614	.3518	.1971	.0994	.0451	.0183	.0066
	3	.9930	.9316	.7899	.5981	.4050	.2459	.1339	.0651	.0281
	4	.9991	.9830	.9209	.7982	.6302	.4499	.2892	.1666	.0853
	5	.9999	.9967	.9765	.9183	.8103	.6598	.4900	.3288	.1976
	6	1.0000	.9995	.9944	.9733	.9204	.8247	.6881	.5272	.3660
	7	1.0000	.9999	.9989	.9930	.9729	.9256	.8406	.7161	.5629
	8	1.0000	1.0000	.9998	.9985	.9925	.9743	.9329	.8577	.7441
	9	1.0000	1.0000	1.0000	.9998	.9984	.9929	.9771	.9417	.8759
	10	1.0000	1.0000	1.0000	1.0000	.9997	.9984	.9938	.9809	.9514
	11	1.0000	1.0000	1.0000	1.0000	1.0000	.9997	.9987	.9951	.9851
	12	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	.9998	.9991	.9965
	13	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	.9991	.9994
	14	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	.9999
	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

(*Continued*)

Table C (*Continued*)

		θ									
n	*x*	*.50*	*.55*	*.60*	*.65*	*.70*	*.75*	*.80*	*.85*	*.90*	*.95*
15	0	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
	1	.0005	.0001	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
	2	.0037	.0011	.0003	.0001	.0000	.0000	.0000	.0000	.0000	.0000
	3	.0176	.0063	.0019	.0005	.0001	.0000	.0000	.0000	.0000	.0000
	4	.0592	.0255	.0093	.0028	.0007	.0001	.0000	.0000	.0000	.0000
	5	.1509	.0769	.0338	.0124	.0037	.0008	.0001	.0000	.0000	.0000
	6	.3036	.1818	.0950	.0422	.0152	.0042	.0008	.0001	.0000	.0000
	7	.5000	.3465	.2131	.1132	.0500	.0173	.0042	.0006	.0000	.0000
	8	.6964	.5478	.3902	.2452	.1311	.0566	.0181	.0036	.0003	.0000
	9	.8491	.7392	.5968	.4357	.2784	.1484	.0611	.0168	.0022	.0001
	10	.9408	.8796	.7827	.6481	.4845	.3135	.1642	.0617	.0127	.0006
	11	.9824	.9576	.9095	.8273	.7031	.5387	.3518	.1773	.0556	.0055
	12	.9963	.9893	.9729	.9383	.8732	.7639	.6020	.3958	.1841	.0362
	13	.9995	.9983	.9948	.9858	.9647	.9198	.8329	.6814	.4510	.1710
	14	1.0000	.9999	.9995	.9984	.9953	.9866	.9648	.9126	.7941	.5367
	15	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.000	1.0000	1.0000	1.0000
16	0	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
	1	.0003	.0001	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
	2	.0021	.0006	.0001	.0000	.0000	.0000	.0000	.0000	.0000	.0000
	3	.0106	.0035	.0009	.0002	.0000	.0000	.0000	.0000	.0000	.0000
	4	.0384	.0149	.0049	.0013	.0003	.0000	.0000	.0000	.0000	.0000
	5	.1051	.0486	.0191	.0062	.0016	.0003	.0000	.0000	.0000	.0000
	6	.2272	.1241	.0583	.0229	.0071	.0016	.0002	.0000	.0000	.0000
	7	.4018	.2559	.1423	.0671	.0257	.0075	.0015	.0002	.0000	.0000
	8	.5982	.4371	.2839	.1594	.0744	.0271	.0070	.0011	.0001	.0000
	9	.7728	.6340	.4728	.3119	.1753	.0796	.0267	.0056	.0005	.0000
	10	.8949	.8024	.6712	.5100	.3402	.1897	.0817	.0235	.0033	.0001
	11	.9616	.9147	.8334	.7108	.5501	.3698	.2018	.0791	.0170	.0009
	12	.9894	.9719	.9349	.8661	.7541	.5950	.4019	.2101	.0684	.0070
	13	.9979	.9934	.9817	.9549	.9006	.8729	.6482	.4386	.2108	.0429
	14	.9997	.9990	.9967	.9902	.9739	.9365	.8593	.7161	.4853	.1892
	15	1.0000	.9999	.9997	.9990	.9967	.9900	.9719	.9257	.8147	.5599
	16	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

(*Continued*)

Table C (*Continued*)

		θ								
n	*x*	*.05*	*.10*	*.15*	*.20*	*.25*	*.30*	*.35*	*.40*	*.45*
17	0	.4181	.1668	.0631	.0225	.0075	.0023	.0007	.0002	.0000
	1	.7922	.4818	.2525	.1182	.0501	.0193	.0067	.0021	.0006
	2	.9497	.7618	.5198	.3096	.1637	.0774	.0327	.0123	.0041
	3	.9912	.9174	.7556	.5489	.3530	.2019	.1028	.0464	.0184
	4	.9988	.9779	.9013	.7582	.5739	.3887	.2348	.1260	.0596
	5	.9999	.9953	.9681	.8943	.7653	.5968	.4197	.2639	.1471
	6	1.0000	.9992	.9917	.9623	.8929	.7752	.6188	.4478	.2902
	7	1.0000	.9999	.9983	.9891	.9598	.8954	.7872	.6405	.4743
	8	1.0000	1.0000	.9997	.9974	.9876	.9597	.9006	.8011	.6626
	9	1.0000	1.0000	1.0000	.9995	.9969	.9873	.9617	.9081	.8166
	10	1.0000	1.0000	1.0000	.9999	.9994	.9968	.9880	.9652	.9174
	11	1.0000	1.0000	1.0000	1.0000	.9999	.9993	.9970	.9894	.9699
	12	1.0000	1.0000	1.0000	1.0000	1.0000	.9999	.9994	.9975	.9914
	13	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	.9999	.9995	.9981
	14	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	.9999	.9997
	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	.3972	.1501	.0536	.0180	.0056	.0016	.0004	.0001	.0000
	1	.7735	.4503	.2241	.0991	.0395	.0142	.0046	.0013	.0003
	2	.9419	.7338	.4797	.2713	.1353	.0600	.0236	.0082	.0025
	3	.9891	.9018	.7202	.5010	.3057	.1646	.0783	.0328	.0120
	4	.9985	.9718	.8794	.7164	.5187	.3327	.1886	.0942	.0411
	5	.9998	.9936	.9581	.8671	.7175	.5344	.3550	.2088	.1077
	6	1.0000	.9988	.9882	.9487	.8610	.7217	.5491	.3743	.2258
	7	1.0000	.9998	.9973	.9837	.9431	.8593	.7283	.5634	.3915
	8	1.0000	1.0000	.9995	.9957	.9807	.9404	.8609	.7368	.5778
	9	1.0000	1.0000	.9999	.9991	.9946	.9790	.9403	.8653	.7473
	10	1.0000	1.0000	1.0000	.9998	.9988	.9939	.9788	.9424	.8720
	11	1.0000	1.0000	1.0000	1.0000	.9998	.9986	.9938	.9797	.9463
	12	1.0000	1.0000	1.0000	1.0000	1.0000	.9997	.9986	.9942	.9817
	13	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	.9997	.9987	.9951
	14	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	.9998	.9990
	15	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	.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

(*Continued*)

Table C (*Continued*)

		θ									
n	*x*	*.50*	*.55*	*.60*	*.65*	*.70*	*.75*	*.80*	*.85*	*.90*	*.95*
17	0	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
	1	.0001	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
	2	.0012	.0003	.0001	.0000	.0000	.0000	.0000	.0000	.0000	.0000
	3	.0064	.0019	.0005	.0001	.0000	.0000	.0000	.0000	.0000	.0000
	4	.0245	.0086	.0025	.0006	.0001	.0000	.0000	.0000	.0000	.0000
	5	.0717	.0301	.0106	.0030	.0007	.0001	.0000	.0000	.0000	.0000
	6	.1662	.0826	.0348	.0120	.0032	.0006	.0001	.0000	.0000	.0000
	7	.3145	.1834	.0919	.0383	.0127	.0031	.0005	.0000	.0000	.0000
	8	.5000	.3374	.1989	.0994	.0403	.0124	.0026	.0003	.0000	.0000
	9	.6855	.5257	.3595	.2128	.1046	.0402	.0109	.0017	.0001	.0000
	10	.8338	.7098	.5522	.3812	.2248	.1071	.0377	.0083	.0008	.0000
	11	.9283	.8529	.7361	.5803	.4032	.2347	.1057	.0319	.047	.0001
	12	.9755	.9404	.8740	.7652	.6113	.4261	.2418	.0987	.0221	.0012
	13	.9936	.9816	.9536	.8972	.7981	.6470	.4511	.2444	.0826	.0088
	14	.9988	.9959	.9877	.9673	.9226	.8363	.6904	.4802	.2382	.0503
	15	.9999	.9994	.9979	.9933	.9807	.9499	.8818	.7475	.5182	.2078
	16	1.0000	1.0000	.9998	.9993	.9977	.9925	.9775	.9369	.8332	.5819
	17	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
18	0	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
	1	.0001	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
	2	.0007	.0001	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
	3	.0038	.0010	.0002	.0000	.0000	.0000	.0000	.0000	.0000	.0000
	4	.0154	.0049	.0013	.0003	.0000	.0000	.0000	.0000	.0000	.0000
	5	.0481	.0183	.0058	.0014	.0003	.0000	.0000	.0000	.0000	.0000
	6	.1189	.0537	.0203	.0062	.0014	.0002	.0000	.0000	.0000	.0000
	7	.2403	.1280	.0576	.0212	.0061	.0012	.0002	.0000	.0000	.0000
	8	.4073	.2527	.1347	.0597	.0210	.0054	.0009	.0001	.0000	.0000
	9	.5927	.4222	.2632	.1391	.0596	.0193	.0043	.0005	.0000	.0000
	10	.7597	.6085	.4366	.2717	.1407	.0569	.0163	.0027	.0002	.0000
	11	.8811	.7742	.6257	.4509	.2783	.1390	.0513	.0118	.0012	.0000
	12	.9519	.8923	.7912	.6450	.4656	.2825	.1329	.0419	.0064	.0002
	13	.9846	.9589	.9058	.8114	.6673	.4813	.2836	.1206	.0282	.0015
	14	.9962	.9880	.9672	.9217	.8354	.6943	.4990	.2798	.0982	.0109
	15	.9993	.9975	.9918	.9764	.9400	.8647	.7287	.5203	.2662	.0581
	16	.9999	.9997	.9987	.9954	.9858	.9605	.9009	.7759	.5497	.2265
	17	1.0000	1.0000	.9999	.9996	.9984	.9944	.9820	.9464	.8499	.6028
	18	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

(*Continued*)

Table C (*Continued*)

		θ								
n	*x*	*.05*	*.10*	*.15*	*.20*	*.25*	*.30*	*.35*	*.40*	*.45*
19	0	.3774	.1351	.0456	.0144	.0042	.0011	.0003	.0001	.0000
	1	.7547	.4203	.1985	.0829	.0310	.0104	.0031	.0008	.0002
	2	.9335	.7054	.4413	.2369	.1113	.0462	.0170	.0055	.0015
	3	.9868	.8850	.6841	.4551	.2631	.1332	.0591	.0230	.0077
	4	.9980	.9648	.8556	.6733	.4654	.2822	.1500	.0696	.0280
	5	.9998	.9914	.9463	.8369	.6678	.4739	.2968	.1629	.0777
	6	1.0000	.9983	.9837	.9324	.8251	.6655	.4812	.3081	.1727
	7	1.0000	.9997	.9959	.9767	.9225	.8180	.6656	.4878	.3169
	8	1.0000	1.0000	.9992	.9933	.9713	.9161	.8145	.6675	.4940
	9	1.0000	1.0000	.9999	.9984	.9911	.9674	.9125	.8139	.6710
	10	1.0000	1.0000	1.0000	.9997	.9977	.9895	.9653	.9115	.8159
	11	1.0000	1.0000	1.0000	1.0000	.9995	.9972	.9886	.9648	.9129
	12	1.0000	1.0000	1.0000	1.0000	.9999	.9994	.9969	.9884	.9658
	13	1.0000	1.0000	1.0000	1.0000	1.0000	.9999	.9993	.9969	.9891
	14	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	.9999	.9994	.9972
	15	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	.9999	.9995
	16	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	.9999
	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	0	.3585	.1216	.0388	.0115	.0032	.0008	.0002	.0000	.0000
	1	.7358	.3917	.1756	.0692	.0243	.0076	.0021	.0005	.0001
	2	.9245	.6769	.4049	.2061	.0913	.0355	.0121	.0036	.0009
	3	.9841	.8670	.6477	.4114	.2252	.1071	.0444	.0160	.0049
	4	.9974	.9568	.8298	.6296	.4148	.2375	.1182	.0510	.0189
	5	.9997	.9887	.9327	.8042	.6172	.4164	.2454	.1256	.0553
	6	1.0000	.9976	.9781	.9133	.7858	.6080	.4166	.2500	.1299
	7	1.0000	.9996	.9941	.9679	.8982	.7723	.6010	.4159	.2520
	8	1.0000	.9999	.9987	.9900	.9591	.8867	.7624	.5956	.4143
	9	1.0000	1.0000	.9998	.9974	.9861	.9520	.8782	.7553	.5914
	10	1.0000	1.0000	1.0000	.9994	.9961	.9829	.9468	.8725	.7507
	11	1.0000	1.0000	1.0000	.9999	.9991	.9949	.9804	.9435	.8692
	12	1.0000	1.0000	1.0000	1.0000	.9998	.9987	.9940	.9790	.9420
	13	1.0000	1.0000	1.0000	1.0000	1.0000	.9997	.9985	.9935	.9786
	14	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	.9997	.9984	.9936
	15	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	.9997	.9985
	16	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	.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

(*Continued*)

Table C (*Continued*)

		θ									
n	*x*	*.50*	*.55*	*.60*	*.65*	*.70*	*.75*	*.80*	*.85*	*.90*	*95*
19	0	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
	1	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
	2	.0004	.0001	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
	3	.0022	.0005	.0001	.0000	.0000	.0000	.0000	.0000	.0000	.0000
	4	.0096	.0028	.0006	.0001	.0000	.0000	.0000	.0000	.0000	.0000
	5	.0318	.0109	.0031	.0007	.0001	.0000	.0000	.0000	.0000	.0000
	6	.0835	.0342	.0116	.0031	.0006	.0001	.0000	.0000	.0000	.0000
	7	.1796	.0871	.0352	.0114	.0028	.0005	.0000	.0000	.0000	.0000
	8	.3238	.1841	.0885	.0347	.0105	.0023	.0003	.0000	.0000	.0000
	9	.5000	.3290	.1861	.0875	.0326	.0089	.0016	.0001	.0000	.0000
	10	.6762	.5060	.3325	.1855	.0839	.0287	.0067	.0008	.0000	.0000
	11	.8204	.6831	.5122	.3344	.1820	.0775	.0233	.0041	.0003	.0000
	12	.9165	.8273	.6919	.5188	.3345	.1749	.0676	.0163	.0017	.0000
	13	.9682	.9223	.8371	.7032	.5261	.3322	.1631	.0537	.0086	.0002
	14	.9904	.9720	.9304	.8500	.7178	.5346	.3267	.1444	.0352	.0020
	15	.9978	.9923	.9770	.9409	.8668	.7369	.5449	.3159	.1150	.0132
	16	.9996	.9985	.9945	.9830	.9538	.8887	.7631	.5587	.2946	.0665
	17	1.0000	.9998	.9992	.9969	.9896	.9690	.9171	.8015	.5797	.2453
	18	1.0000	1.0000	.9999	.9997	.9989	.9958	.9856	.9544	.8649	.6226
	19	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
20	0	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
	1	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
	2	.0002	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
	3	.0013	.0003	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
	4	.0059	.0015	.0003	.0000	.0000	.0000	.0000	.0000	.0000	.0000
	5	.0207	.0064	.0016	.0003	.0000	.0000	.0000	.0000	.0000	.0000
	6	.0577	.0214	.0065	.0015	.0003	.0000	.0000	.0000	.0000	.0000
	7	.1316	.0580	.0210	.0060	.0013	.0002	.0000	.0000	.0000	.0000
	8	.2517	.1308	.0565	.0196	.0051	.0009	.0001	.0000	.0000	.0000
	9	.4119	.2493	.1275	.0532	.0171	.0039	.0006	.0000	.0000	.0000
	10	.5881	.4086	.2447	.1218	.0480	.0139	.0026	.0002	.0000	.0000
	11	.7483	.5857	.4044	.2376	.1133	.0409	.0100	.0013	.0001	.0000
	12	.8684	.7480	.5841	.3990	.2277	.1018	.0321	.0059	.0004	.0000
	13	.9423	.8701	.7500	.5834	.3920	.2142	.0867	.0219	.0024	.0000
	14	.9793	.9447	.8744	.7546	.5836	.3828	.1958	.0673	.0113	.0003
	15	.9941	.9811	.9490	.8818	.7625	.5852	.3704	.1702	.0432	.0026
	16	.9987	.9951	.9840	.9556	.8929	.7748	.5886	.3523	.1330	.0159
	17	.9998	.9991	.9964	.9879	.9645	.9087	.7939	.5951	.3231	.0755
	18	1.0000	.9999	.9995	.9979	.9924	.9757	.9308	.8244	.6083	.2642
	19	1.0000	1.0000	1.0000	.9998	.9992	.9968	.9885	.9612	.8784	.6415
	20	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Source: Adapted from Table 2 of *Tables of the Binomial Distribution,* (*January 1950 with Corrigenda* 1952 and 1958), National Bureau of Standards, U.S. Government Printing Office, Washington, D.C., with permission.

Table D Total Number of Runs Distribution

Each table entry labeled P is the tail probability from each extreme to the value of R, the total number of runs in a sequence of $n = n_1 + n_2$ symbols of two types for $n_1 \leqslant n_2$.

Left-tail probabilities

n_1	n_2	R	P	n_1	n_2	R	P	n_1	n_2	R	P	n_1	n_2	R	P
2	2	2	.333	2	18	2	.011	3	14	2	.003	4	10	2	.002
2	3	2	.200			3	.105			3	.025			3	.014
		3	.500			4	.284			4	.101			4	.068
2	4	2	.133	3	3	2	.100			5	.350			5	.203
		3	.400			3	.300	3	15	2	.002			6	.419
2	5	2	.095	3	4	2	.057			3	.022	4	11	2	.001
		3	.333			3	.200			4	.091			3	.011
2	6	2	.071	3	5	2	.036			5	.331			4	.055
		3	.286			3	.143	3	16	2	.002			5	.176
2	7	2	.056			4	.429			3	.020			6	.374
		3	.250	3	6	2	.024			4	.082	4	12	2	.001
2	8	2	.044			3	.107			5	.314			3	.009
		3	.222			4	.345	3	17	2	.002			4	.045
2	9	2	.036	3	7	2	.017			3	.018			5	.154
		3	.200			3	.083			4	.074			6	.335
		4	.491			4	.283			5	.298	4	13	2	.001
2	10	2	.030	3	8	2	.012	4	4	2	.029			3	.007
		3	.182			3	.067			3	.114			4	.037
		4	.455			4	.236			4	.371			5	.136
2	11	2	.026	3	9	2	.009	4	5	2	.016			6	.302
		3	.167			3	.055			3	.071	4	14	2	.001
		4	.423			4	.200			4	.262			3	.006
2	12	2	.022			5	.491			5	.500			4	.031
		3	.154	3	10	2	.007	4	6	2	.010			5	.121
		4	.396			3	.045			3	.048			6	.274
2	13	2	.019			4	.171			4	.190	4	15	2	.001
		3	.143			5	.455			5	.405			3	.005
		4	.371	3	11	2	.005	4	7	2	.006			4	.027
2	14	2	.017			3	.038			3	.033			5	.108
		3	.133			4	.148			4	.142			6	.249
		4	.350			5	.423			5	.333	4	16	2	.000
2	15	2	.015	3	12	2	.004	4	8	2	.004			3	.004
		3	.125			3	.033			3	.024			4	.023
		4	.331			4	.130			4	.109			5	.097
2	16	2	.013			5	.396			5	.279			6	.227
		3	.118	3	13	2	.004	4	9	2	.003	5	5	2	.008
		4	.314			3	.029			3	.018			3	.040
2	17	2	.012			4	.114			4	.085			4	.167
		3	.111			5	.371			5	.236			5	.357
		4	.298							6	.471				

(*Continued*)

Table D (*Continued*)

Left-tail probabilities

n_1	n_2	R	P	n_1	n_2	R	P	n_1	n_2	R	P	n_1	n_2	R	P
5	6	2	.004	5	14	2	.000	6	11	2	.000	7	9	2	.000
		3	.024			3	.002			3	.001			3	.001
		4	.110			4	.011			4	.009			4	.010
		5	.262			5	.044			5	.036			5	.035
5	7	2	.003			6	.125			6	.108			6	.108
		3	.015			7	.299			7	.242			7	.231
		4	.076			8	.496			8	.436			8	.427
		5	.197	5	15	2	.000	6	12	2	.000	7	10	2	.000
		6	.424			3	.001			3	.001			3	.001
5	8	2	.002			4	.009			4	.007			4	.006
		3	.010			5	.037			5	.028			2	.024
		4	.054			6	.108			6	.087			6	.080
		5	.152			7	.272			7	.205			7	.182
		6	.347			8	.460			8	.383			8	.355
5	9	2	.001	6	6	2	.002	6	13	2	.000	7	11	2	.000
		3	.007			3	.013			3	.001			3	.001
		4	.039			4	.067			4	.005			4	.004
		5	.119			5	.175			5	.022			5	.018
		6	.287			6	.392			6	.070			6	.060
5	10	2	.001	6	7	2	.001			7	.176			7	.145
		3	.005			3	.008			8	.338			8	.296
		4	.029			4	.043	6	14	2	.000			9	.484
		5	.095			5	.121			3	.001	7	12	2	.000
		6	.239			6	.296			4	.004			3	.000
		7	.455			7	.500			5	.017			4	.003
5	11	2	.000	6	8	2	.001			6	.058			5	.013
		3	.004			3	.005			7	.151			6	.046
		4	.022			4	.028			8	.299			7	.117
		5	.077			5	.086	7	7	2	.001			8	.247
		6	.201			6	.226			3	.004			9	.428
		7	.407			7	.413			4	.025	7	13	2	.000
5	12	2	.000	6	9	2	.000			5	.078			3	.000
		3	.003			3	.003			6	.209			4	.002
		4	.017			4	.019			7	.383			5	.010
		5	.063			5	.063	7	8	2	.000			6	.035
		6	.170			6	.175			3	.002			7	.095
		7	.365			7	.343			4	.015			8	.208
5	13	2	.000	6	10	2	.000			5	.051			9	.378
		3	.002			3	.002			6	.149	8	8	2	.000
		4	.013			4	.013			7	.296			3	.001
		5	.053			5	.047							4	.009
		6	.145			6	.137							5	.032
		7	.330			7	.287							6	.100
						8	.497							7	.214
														8	.405

(*Continued*)

Table D (*Continued*)

Left-tail probabilities

n_1	n_2	R	P	n_1	n_2	R	P	n_1	n_2	R	P	n_1	n_2	R	P
8	9	2	.000	9	9	2	.000	10	10	2	.000	11	11	2	.000
		3	.001			3	.000			3	.000			3	.000
		4	.005			4	.003			4	.001			4	.000
		5	.020			5	.012			5	.004			5	.002
		6	.069			6	.044			6	.019			6	.007
		7	.157			7	.109			7	.051			7	.023
		8	.319			8	.238			8	.128			8	.063
		9	.500			9	.399			9	.242			9	.135
8	10	2	.000	9	10	2	.000			10	.414			10	.260
		3	.000			3	.000	10	11	2	.000			11	.410
		4	.003			4	.002			3	.000	11	12	2	.000
		5	.013			5	.008			4	.001			3	.000
		6	.048			6	.029			5	.003			4	.000
		7	.117			7	.077			6	.012			5	.001
		8	.251			8	.179			7	.035			6	.005
		9	.419			9	.319			8	.092			7	.015
8	11	2	.000	9	11	2	.000			9	.185			8	.044
		3	.000			3	.000			10	.335			9	.099
		4	.002			4	.001			11	.500			10	.202
		5	.009			5	.005	10	12	2	.000			11	.335
		6	.034			6	.020			3	.000	12	12	2	.000
		7	.088			7	.055			4	.000			3	.000
		8	.199			8	.135			5	.002			4	.000
		9	.352			9	.255			6	.008			5	.001
8	12	2	.000			10	.430			7	.024			6	.003
		3	.000	9	12	2	.000			8	.067			7	.009
		4	.001			3	.000			9	.142			8	.030
		5	.006			4	.001			10	.271			9	.070
		6	.025			5	.003			11	.425			10	.150
		7	.067			6	.014							11	.263
		8	.159			7	.040							12	.421
		9	.297			8	.103								
		10	.480			9	.205								
						10	.362								

(*Continued*)

Table D (*continued*)

							Right-tail probabilities								
n_1	n_2	R	P	n_1	n_2	R	P	n_1	n_2	R	P	n_1	n_2	R	P
2	2	4	.333	4	8	9	.071	5	11	11	.058	6	12	12	.075
2	3	5	.100			8	.212			10	.154			11	.217
		4	.500			7	.467			9	.374			10	.395
2	4	5	.200	4	9	9	.098	5	12	11	.075	6	13	13	.034
2	5	5	.286			8	.255			10	.181			12	.092
2	6	5	.357	4	10	9	.126	5	12	9	.421			11	.257
2	7	5	.417			8	.294	5	13	11	.092			10	.439
2	8	5	.467	4	11	9	.154			10	.208	6	14	13	.044
3	3	6	.100			8	.330			9	.465			12	.111
		5	.300	4	12	9	.181	5	14	11	.111			11	.295
3	4	7	.029			8	.363			10	.234			10	.480
		6	.200	4	13	9	.208	5	15	11	.129	7	7	14	.001
		5	.457			8	.393			10	.258			13	.004
3	5	7	.071	4	14	9	.234	6	6	12	.002			12	.025
		6	.286			8	.421			11	.013			11	.078
3	6	7	.119	4	15	9	.258			10	.067			10	.209
		6	.357			8	.446			9	.175			9	.383
3	7	7	.167	4	16	9	.282			8	.392	7	8	15	.000
		6	.417			8	.470	6	7	13	.001			14	.002
3	8	7	.212	5	5	10	.008			12	.008			13	.012
		6	.467			9	.040			11	.034			12	.051
3	9	7	.255			8	.167			10	.121			11	.133
3	10	7	.294			7	.357			9	.267			10	.296
3	11	7	.330	5	6	11	.002			8	.500			9	.486
3	12	7	.363			10	.024	6	8	13	.002	7	9	15	.001
3	13	7	.393			9	.089			12	.016			14	.006
3	14	7	.421			8	.262			11	.063			13	.025
3	15	7	.446			7	.478			10	.179			12	.084
3	16	7	.470	5	7	11	.008			9	.354			11	.194
3	17	7	.491			10	.045	6	9	13	.006			10	.378
4	4	8	.029			9	.146			12	.028	7	10	15	.002
		7	.114			8	.348			11	.098			14	.010
		6	.371	5	8	11	.016			10	.238			13	.043
4	5	9	.008			10	.071			9	.434			12	.121
		8	.071			9	.207	6	10	13	.010			11	.257
		7	.214			8	.424			12	.042			10	.451
		6	.500	5	9	11	.028			11	.136	7	11	15	.004
4	6	9	.024			10	.098			10	.294			14	.017
		8	.119			9	.266	6	11	13	.017			13	.064
		7	.310			8	.490			12	.058			12	.160
4	7	9	.045	5	10	11				11	.176			11	.318
		8	.167			10	.126			10	.346	7	12	15	.007
		7	.394			9	.322	6	12	13	.025			14	.025

(*Continued*)

Table D (*continued*)

			Right-tail probabilities								
n_1	n_2	R	P	n_1	n_2	R	P	n_1	n_2	R	P
7	12	13	.089	9	9	18	.00	10	13	13	.320
		12	.199			17	.000			12	.500
		11	.376			16	.003	10	12	21	.000
7	13	15	.010			15	.012			20	.000
		14	.034			14	.044			19	.001
		13	.116			13	.109			18	.006
		12	.238			12	.238			17	.020
		11	.430			11	.399			16	.056
8	8	16	.000	9	10	19	.000			15	.125
		15	.001			18	.000			14	.245
		14	.009			17	.001			13	.395
		13	.032			16	.008	11	11	22	.000
		12	.100			15	.026			21	.000
		11	.214			14	.077			20	.000
		10	.405			13	.166			19	.002
8	9	17	.000			12	.319			18	.007
		16	.001			11	.490			17	.023
		15	.004	9	11	19	.000			16	.063
		14	.020			18	.001			15	.135
		13	.061			17	.003			14	.260
		12	.157			16	.015			13	.410
		11	.298			15	.045	11	12	23	.000
		10	.500			14	.115			22	.000
8	10	17	.000			13	.227			21	.000
		16	.002			12	.395			20	.001
		15	.010	10	10	20	.000			19	.004
		14	.036			19	.000			18	.015
		13	.097			18	.000			17	.041
		12	.218			17	.001			16	.099
		11	.379			16	.004			15	.191
8	11	17	.001			17	.019			14	.335
		16	.004			16	.051			13	.493
		15	.018			15	.128	12	12	24	.000
		14	.057			14	.242			23	.000
		13	.138			13	.414			22	.000
		12	.278	10	11	21	.000			21	.001
		11	.453			20	.000			20	.003
8	12	17	.001			19	.000			19	.009
		16	.007			18	.003			18	.030
		15	.029			17	.010			17	.070
		14	.080			16	.035			16	.150
		13	.183			15	.085			15	.263
		12	.337			14	.185			14	.421

Source: Adapted from F. S. Swed and C. Eisenhart (1943), Tables for testing the randomness of grouping in a sequence of alternatives, *Annals of Mathematical Statistics*, 14, 66–87, with permission.

Table E Runs Up and Down Distribution

Each table entry labeled P is the tail probability from each extreme to the value of R, the total number of runs up and down in a sequence of n observations, or equivalently, $n - 1$ plus or minus signs.

n	R	*Left-tail P*	R	*Right-tail P*	n	R	*Left-tail P*	R	*Right-tail P*
3	1	.3333	2	.6667	13	1	.0000		
4			3	.4167		2	.0000		
	1	.0833	2	.9167		3	.0001	12	.0072
5	1	.0167	4	.2667		4	.0026	11	.0568
	2	.2500	3	.7500		5	.0213	10	.2058
6	1	.0028				6	.0964	9	.4587
	2	.0861	5	.1694		7	.2749	8	.7251
	3	.4139	4	.5861	14	1	.0000		
7	1	.0004	6	.1079		2	.0000		
	2	.0250	5	.4417		3	.0000		
	3	.1909	4	.8091		4	.0007	13	.0046
8	1	.0000				5	.0079	12	.0391
	2	.0063	7	.0687		6	.0441	11	.1536
	3	.0749	6	.3250		7	.1534	10	.3722
	4	.3124	5	.6876		8	.3633	9	.6367
9	1	.0000			15	1	.0000		
	2	.0014				2	.0000		
	3	.0257	8	.0437		3	.0000		
	4	.1500	7	.2347		4	.0002		
	5	.4347	6	.5653		5	.0027	14	.0029
10	1	.0000				6	.0186	13	.0267
	2	.0003	9	.0278		7	.0782	12	.1134
	3	.0079	8	.1671		8	.2216	11	.2970
	4	.0633	7	.4524		9	.4520	10	.5480
	5	.2427	6	.7573	16	1	.0000		
11	1	.0000				2	.0000		
	2	.0001				3	.0000		
	3	.0022	10	.0177		4	.0001	15	.0019
	4	.0239	9	.1177		5	.0009	14	.0182
	5	.1196	8	.3540		6	.0072	13	.0828
	6	.3438	7	.6562		7	.0367	12	.2335
12	1	.0000				8	.1238	11	.4631
	2	.0000				9	.2975	10	.7025
	3	.0005							
	4	.0082	11	.0113					
	5	.0529	10	.0821					
	6	.1918	9	.2720					
	7	.4453	8	.5547					

(*Continued*)

Table E (*Continued*)

n	*R*	*Left-tail P*	*R*	*Right-tail P*
17	1	.0000		
	2	.0000		
	3	.0000		
	4	.0000		
	5	.0003	16	.0012
	6	.0026	15	.0123
	7	.0160	14	.0600
	8	.0638	13	.1812
	9	.1799	12	.3850
	10	.3770	11	.6230
18	1	.0000		
	2	.0000		
	3	.0000		
	4	.0000		
	5	.0001		
	6	.0009	17	.0008
	7	.0065	16	.0083
	8	.0306	15	.0431
	9	.1006	14	.1389
	10	.2443	13	.3152
	11	.4568	12	.5432
19	1	.0000		
	2	.0000		
	3	.0000		
	4	.0000		
	4	.0000		
	5	.0000	18	.0005
	6	.0003	17	.0056
	7	.0025	16	.0308
	8	.0137	15	.1055
	9	.0523	14	.2546
	10	.1467	13	.4663
	11	.3144	12	.6856
20	1	.0000		
	2	.0000		
	3	.0000		
	4	.0000		
	5	.0000		
	6	.0001	19	.0003
	7	.0009	18	.0038
	8	.0058	17	.0218
	9	.0255	16	.0793
	10	.0821	15	.2031
	11	.2012	14	.3945
	12	.3873	13	.6127
21	1	.0000		
	2	.0000		
	3	.0000		
	4	.0000		
	5	.0000		
	6	.0000		
	7	.0003	20	.0002
	8	.0023	19	.0025
	9	.0117	18	.0154
	10	.0431	17	.0591
	11	.1202	16	.1602
	12	.2622	15	.3293
	13	.4603	14	.5397
22	1	.0000		
	2	.0000		
	3	.0000		
	4	.0000		
	5	.0000		
	6	.0000	21	.0001
	7	.0001	20	.0017
	8	.0009	19	.0108
	9	.0050	18	.0437
	10	.0213	17	.1251
	11	.0674	16	.2714
	12	.1661	15	.4688
	13	.3276	14	.6724
23	1	.0000		
	2	.0000		
	3	.0000		
	4	.0000		
	5	.0000		
	6	.0000		
	7	.0000	22	.0001
	8	.0003	21	.0011
	9	.0021	20	.0076
	10	.0099	19	.0321
	11	.0356	18	.0968
	12	.0988	17	.2211
	13	.2188	16	.4020
	14	.3953	15	.6047

(*Continued*)

Table E (*Continued*)

n	*R*	*Left-tail P*	*R*	*Right-tail P*	*n*	*R*	*Left-tail P*	*R*	*Right-tail P*
24	1	.0000			25	1	.0000		
	2	.0000				2	.0000		
	3	.0000				3	.0000		
	4	.0000				4	.0000		
	5	.0000				5	.0000		
	6	.0000				6	.0000		
	7	.0000				7	.0000	24	.0000
	8	.0001	23	.0000		8	.0000	23	.0005
	9	.0008	22	.0007		9	.0003	22	.0037
	10	.0044	21	.0053		10	.0018	21	.0170
	11	.0177	20	.0235		11	.0084	20	.0564
	12	.0554	19	.0742		12	.0294	19	.1423
	13	.1374	18	.1783		13	.0815	18	.2852
	14	.2768	17	.3405		14	.1827	17	.4708
	15	.4631	16	.5369		15	.3384	16	.6616

Source: Adapted from E. S. Edgington (1961), Probability table for number of runs of signs of first differences, *Journal of the American Statistical Association*, 56, 156–159, with permission.

Table F Kolmogorov-Smirnov One-Sample Statistic

Each table entry is the value of a Kolmogorov-Smirnov one-sample statistic D_n for sample size n such that its right-tail probability is the value given on the top row.

n	.200	.100	.050	.020	.010	n	.200	.100	.050	.020	.010
1	.900	.950	.975	.990	.995	21	.226	.259	.287	.321	.344
2	.684	.776	.842	.900	.929	22	.221	.253	.281	.314	.337
3	.565	.636	.780	.785	.829	23	.216	.247	.275	.307	.330
4	.493	.565	.624	.689	.734	24	.212	.242	.269	.301	.323
5	.447	.509	.563	.627	.669	25	.208	.238	.264	.295	.317
6	.410	.468	.519	.577	.617	26	.204	.233	.259	.290	.311
7	.381	.436	.483	.538	.576	27	.200	.229	.254	.284	.305
8	.358	.410	.454	.507	.542	28	.197	.225	.250	.279	.300
9	.339	.387	.430	.480	.513	29	.193	.221	.246	.275	.295
10	.323	.369	.409	.457	.489	30	.190	.218	.242	.270	.290
11	.308	.352	.391	.437	.468	31	.187	.214	.238	.266	.285
12	.296	.338	.375	.419	.449	32	.184	.211	.234	.262	.281
13	.285	.325	.361	.404	.432	33	.182	.208	.231	.258	.277
14	.275	.314	.349	.390	.418	34	.179	.205	.227	.254	.273
15	.266	.304	.338	.377	.404	35	.177	.202	.224	.251	.269
16	.258	.295	.327	.366	.392	36	.174	.199	.221	.247	.265
17	.250	.286	.318	.355	.381	37	.172	.196	.218	.244	.262
18	.244	.279	.309	.346	.371	38	.170	.194	.215	.241	.258
19	.237	.271	.301	.337	.361	39	.168	.191	.213	.238	.255
20	.232	.265	.294	.329	.352	40	.165	.189	.210	.235	.252

For $n > 40$, right-tail critical values based on the asymptotic distribution can be calculated as follows:

.200	.100	.050	.020	.010
$1.07/\sqrt{n}$	$1.22/\sqrt{n}$	$1.36/\sqrt{n}$	$1.52/\sqrt{n}$	$1.63/\sqrt{n}$

Source: Adapted from L. H. Miller (1956), Table of percentage points of Kolmogorov statistics, *Journal of the American Statistical Association*, **51**, 111–121, with permission.

Table G Binomial Distribution for $\theta = 0.5$

Each table entry labeled P is the tail probability from each extreme to the value of K, the number of successes in N Bernoulli trials with probability of success $\theta = 0.5$ on each trial.

N	*Left tail*	P	*Right tail*	N	*Left tail*	P	*Right tail*	N	*Left tail*	P	*Right tail*
1	0	.5000	1	12	0	.0002	12	17	0	.0000	17
2	0	.2500	2		1	.0032	11		1	.0001	16
	1	.7500	1		2	.0193	10		2	.0012	15
3	0	.1250	3		3	.0730	9		3	.0064	14
	1	.5000	2		4	.1938	8		4	.0245	13
4	0	.0625	4		5	.3872	7		5	.0717	12
	1	.3125	3		6	.6128	6		6	.1662	11
	2	.6875	2	13	0	.0001	13		7	.3145	10
5	0	.0312	5		1	.0017	12		8	.5000	9
	1	.1875	4		2	.0112	11	18	0	.0000	18
	2	.5000	3		3	.0461	10		1	.0001	17
6	0	.0156	6		4	.1334	9		2	.0007	16
	1	.1094	5		5	.2905	8		3	.0038	15
	2	.3438	4		6	.5000	7		4	.0154	14
	3	.6562	3	14	0	.0000	14		5	.0481	13
7	0	.0078	7		1	.0009	13		6	.1189	12
	1	.0625	6		2	.0065	12		7	.2403	11
	2	.2266	5		3	.0287	11		8	.4073	10
	3	.5000	4		4	.0898	10		9	.5927	9
8	0	.0039	8		5	.2120	9	19	0	.0000	19
	1	.0352	7		6	.3953	8		1	.0000	18
	2	.1445	6		7	.6047	7		2	.0004	17
	3	.3633	5	15	0	.0000	15		3	.0022	16
	4	.6367	4		1	.0005	14		4	.0096	15
9	0	.0020	9		2	.0037	13		5	.0318	14
	1	.0195	8		3	.0176	12		6	.0835	13
	2	.0898	7		4	.0592	11		7	.1796	12
	3	.2539	6		5	.1509	10		8	.3238	11
	4	.5000	5		6	.3036	9		9	.5000	10
10	0	.0010	10		7	.5000	8	20	0	.0000	20
	1	.0107	9	16	0	.0000	16		1	.0000	19
	2	.0547	8		1	.0003	15		2	.0002	18
	3	.1719	7		2	.0021	14		3	.0013	17
	4	.3770	6		3	.0106	13		4	.0059	16
	5	.6230	5		4	.0384	12		5	.0207	15
11	0	.0005	11		5	.1051	11		6	.0577	14
	1	.0059	10		6	.2272	10		7	.1316	13
	2	.0327	9		7	.4018	9		8	.2517	12
	3	.1133	8		8	.5982	8		9	.4119	11
	4	.2744	7						10	.5881	10
	5	.5000	6								

Table H Probabilities for the Wilcoxon Signed-Rank Statistic

Each table entry labeled P is the tail probability from each extreme to the value of T, the Wilcoxon signed-rank statistic for sample side N, where T is interpreted as either T^+ or T^-.

N	*Left tail*	*P*	*Right tail*	*N*	*Left tail*	*P*	*Right tail*	*N*	*Left tail*	*P*	*Right tail*
2	0	.250	3	7	0	.008	28	9	0	.002	45
	1	.500	2		1	.016	27		1	.004	44
3	0	.125	6		2	.023	26		2	.006	43
	1	.250	5		3	.039	25		3	.010	42
	2	.375	4		4	.055	24		4	.014	41
	3	.625	3		5	.078	23		5	.020	40
4	0	.062	10		6	.109	22		6	.027	39
	1	.125	9		7	.148	21		7	.037	38
	2	.188	8		8	.188	20		8	.049	37
	3	.312	7		9	.234	19		9	.064	36
	4	.438	6		10	.289	18		10	.082	35
	5	.562	5		11	.344	17		11	.102	34
5	0	.031	15		12	.406	16		12	.125	33
	1	.062	14		13	.469	15		13	.150	32
	2	.094	13		14	.531	14		14	.180	31
	3	.156	12	8	0	.004	36		15	.213	30
	4	.219	11		1	.008	35		16	.248	29
	5	.312	10		2	.012	34		17	.285	28
	6	.406	9		3	.020	33		18	.326	27
	7	.500	8		4	.027	32		19	.367	26
6	0	.016	21		5	.039	31		20	.410	25
	1	.031	20		6	.055	30		21	.455	24
	2	.047	19		7	.074	29		22	.500	23
	3	.078	18		8	.098	28	10	0	.001	55
	4	.109	17		9	.125	27		1	.002	54
	5	.156	16		10	.156	26		2	.003	53
	6	.219	15		11	.191	25		3	.005	52
	7	.281	14		12	.230	24		4	.007	51
	8	.344	13		13	.273	23		5	.010	50
	9	.422	12		14	.320	22		6	.014	49
	10	.500	11		15	.371	21		7	.019	48
					16	.422	20		8	.024	47
					17	.473	19		9	.032	46
					18	.527	18		10	.042	45

(*Continued*)

Table H (*Continued*)

N	*Left tail*	*P*	*Right tail*	*N*	*Left tail*	*P*	*Right tail*	*N*	*Left tail*	*P*	*Right tail*
10	11	.053	44	11	28	.350	38	13	0	.000	91
	12	.065	43		29	.382	37		1	.000	90
	13	.080	42		30	.416	36		2	.000	89
	14	.097	41		31	.449	35		3	.001	88
	15	.116	40		32	.483	34		4	.001	87
	16	.138	39		33	.517	33		5	.001	86
	17	.161	38	12	0	.000	78		6	.002	85
	18	.188	37		1	.000	77		7	.002	84
	19	.216	36		2	.001	76		8	.003	83
	20	.246	35		3	.001	75		9	.004	82
	21	.278	34		4	.002	74		10	.005	81
	22	.312	33		5	.002	73		11	.007	80
	23	.348	32		6	.003	72		12	.009	79
	24	.385	31		7	.005	71		13	.011	78
	25	.423	30		8	.006	70		14	.013	77
	26	.461	29		9	.008	69		15	.016	76
	27	.500	28		10	.010	68		16	.020	75
11	0	.000	66		11	.013	67		17	.024	74
	1	.001	65		12	.017	66		18	.029	73
	2	.001	64		13	.021	65		19	.034	72
	3	.002	63		14	.026	64		20	.040	71
	4	.003	62		15	.032	63		21	.047	70
	5	.005	61		16	.039	62		22	.055	69
	6	.007	60		17	.0456	61		23	.064	68
	7	.009	59		18	.055	60		24	.073	67
	8	.0125	58		19	.065	59		25	.084	66
	9	.016	57		20	.076	58		26	.095	65
	10	.021	56		21	.088	57		27	.108	64
	11	.027	55		22	.102	56		28	.122	63
	12	.034	54		23	.117	55		29	.137	62
	13	.042	53		24	.133	54		30	.153	61
	14	.051	52		25	.151	53		31	.170	60
	15	.062	51		26	.170	52		32	.188	59
	16	.074	50		27	.190	51		33	.207	58
	17	.087	49		28	.212	50		34	.227	57
	18	.103	48		29	.235	49		35	.249	56
	19	.120	47		30	.259	48		36	.271	55
	20	.139	46		31	.285	47		37	.294	54
	21	.160	45		32	.311	46		38	.318	53
	22	.183	44		33	.339	45		39	.342	52
	23	.207	43		34	.367	44		40	.368	51
	24	.232	42		35	.396	43		41	.393	50
	25	.260	41		36	.425	42		42	.420	49
	26	.289	40		37	.455	41		43	.446	48
	27	.319	39		38	.485	40		44	.473	47
					39	.515	39		45	.500	46

(*Continued*)

Table H (*Continued*)

N	*Left tail*	*P*	*Right tail*	*N*	*Left tail*	*P*	*Right tail*	*N*	*Left tail*	*P*	*Right tail*
14	0	.000	105	14	46	.357	59	15	39	.126	81
	1	.000	104		47	.380	58		40	.138	80
	2	.000	103		48	.404	57		41	.151	79
	3	.000	102		49	.428	56		42	.165	78
	4	.000	101		50	.452	55		43	.180	77
	5	.001	100		51	.476	54		44	.195	76
	6	.001	99		52	.500	53		45	.211	75
	7	.001	98	15	0	.000	120		46	.227	74
	8	.002	97		1	.000	119		47	.244	73
	9	.002	96		2	.000	118		48	.262	72
	10	.003	95		3	.000	117		49	.281	71
	11	.003	94		4	.000	116		50	.300	70
	12	.004	93		5	.000	115		51	.319	69
	13	.005	92		6	.000	114		52	.339	68
	14	.007	91		7	.001	113		53	.360	67
	15	.008	90		8	.001	112		54	.381	66
	16	.010	89		9	.001	111		55	.402	65
	17	.012	88		10	.001	110		56	.423	64
	18	.0158	87		11	.002	109		57	.445	63
	19	.018	86		12	.002	108		58	.467	62
	20	.021	85		13	.003	107		59	.489	61
	21	.025	84		14	.003	106		60	.511	60
	22	.029	83		15	.004	105				
	23	.034	82		16	.005	104				
	24	.039	81		17	.006	103				
	25	.045	80		18	.008	102				
	26	.052	79		19	.009	101				
	27	.059	78		20	.011	100				
	28	.068	77		21	.013	99				
	29	.077	76		22	.015	98				
	30	.086	75		23	.018	97				
	31	.097	74		24	.021	96				
	32	.108	73		25	.024	95				
	33	.121	72		26	.028	94				
	34	.134	71		27	.032	93				
	35	.148	70		28	.036	92				
	36	.163	69		29	.042	91				
	37	.179	68		30	.047	90				
	38	.196	67		31	.053	89				
	39	.213	66		32	.060	88				
	40	.232	65		33	.068	87				
	41	.251	64		34	.076	86				
	42	.271	63		35	.084	85				
	43	.292	62		36	.094	84				
	44	.313	61		37	.104	83				
	45	.335	60		38	.115	82				

Source: Adapted from F. Wilcoxon, S.K. Katti, and R. A. Wilcox (1973), Critical values and probability levels for the Wilcoxon rank sum test and the Wilcoxon signed rank test, pp. 171–259 in Institute of Mathematical Statistics, ed., *Selected Tables in Mathematical Statistics* vol. I, American Mathematical Society, Providence, Rhode Island, with permission.

Table I Kolmogorov-Smirnov Two-Sample Statistic

Each table entry labeled P is the right-tail probability of $mnD_{m,n}$, the Kolmogorov-Smirnov two-sample statistic for sample sizes m and n where $m \leqslant n$. The second portion of the table gives the value of $mnD_{m,n}$ such that its right-tail probability is the value given on the top row.

m	n	mnD	P	m	n	mnD	P	m	n	mnD	P
2	2	4	.333	3	6	18	.024	4	5	20	.016
2	3	6	.200			15	.095			16	.079
2	4	8	.133			12	.333			15	.143
2	5	10	.095	3	7	21	.017	4	6	24	.010
		8	.286			18	.067			20	.048
2	6	12	.071			15	.167			18	.095
		10	.214	3	8	24	.012			16	.181
2	7	14	.056			21	.048	4	7	28	.006
		12	.167			18	.121			24	.030
2	8	16	.044	3	9	27	.009			21	.067
		14	.133			24	.036			20	.121
2	9	18	.036			21	.091	4	8	32	.004
		16	.109			18	.236			28	.020
2	10	20	.030	3	10	30	.007			24	.085
		18	.091			27	.028			20	.222
		16	.182			24	.070	4	9	36	.003
2	11	22	.026			21	.140			32	.014
		20	.077	3	11	33	.005			28	.042
		18	.154			30	.022			27	.062
2	12	24	.022			27	.055			24	.115
		22	.066			24	.110	4	10	40	.002
		20	.132	3	12	36	.004			36	.010
3	3	9	.100			33	.018			32	.030
3	4	12	.057			30	.044			30	.046
		9	.229			27	.088			28	.084
3	5	15	.036			24	.189			26	.126
		12	.143	4	4	16	.029				
						12	.229				

(*Continued*)

Table I (*Continued*)

m	n	mnD	P	m	n	mnD	P	m	n	mnD	P
4	11	44	.001	5	10	50	.001	6	10	60	.000
		40	.007			45	.004			54	.002
		36	.022			40	.019			50	.004
		33	.035			35	.061			48	.009
		32	.063			30	.166			44	.019
		29	.098	5	11	55	.000			42	.031
		28	.144			50	.003			40	.042
4	12	48	.001			45	.010			38	.066
		44	.005			44	.014			36	.092
		40	.016			40	.029			34	.125
		36	.048			39	.044	7	7	49	.001
		32	.112			35	.074			42	.008
5	5	25	.008			34	.106			35	.053
		20	.079	6	6	36	.002			28	.212
		15	.357			30	.026	7	8	56	.000
5	6	30	.004			24	.143			49	.002
		25	.026	6	7	42	.001			48	.005
		24	.048			36	.008			42	.013
		20	.108			35	.015			41	.024
5	7	35	.003			30	.038			40	.033
		30	.015			29	.068			35	.056
		28	.030			28	.091			34	.087
		25	.066			24	.147			33	.118
		23	.166	6	8	48	.001	7	9	63	.000
5	8	40	.022			42	.005			56	.001
		35	.009			40	.009			54	.003
		32	.020			36	.023			49	.008
		30	.042			34	.043			47	.015
		27	.079			32	.061			45	.021
		25	.126			30	.093			42	.034
5	9	45	.001			28	.139			40	.055
		40	.006	6	9	54	.000			38	.079
		36	.014			48	.003			36	.098
		35	.028			45	.006			35	.127
		31	.056			42	.014	8	8	64	.000
		30	.086			39	.028			56	.002
		27	.119			36	.061			48	.019
						33	.095			40	.087
						30	.176			32	.283

(*Continued*)

Table I (*Continued*)

$m = n$	*.200*	*.100*	*.050*	*.020*	*.010*
9	45	54	54	63	63
10	50	60	70	70	80
11	66	66	77	88	88
12	72	72	84	96	96
13	78	91	91	104	117
14	84	98	112	112	126
15	90	105	120	135	135
16	112	112	128	144	160
17	119	136	136	153	170
18	126	144	162	180	180
19	133	152	171	190	190
20	140	160	180	200	220

For m and n large, right-tail critical values based on the asymptotic distribution can be calculated as follows:

$$\frac{.200}{1.07\sqrt{N/mn}} \qquad \frac{.100}{1.22\sqrt{N/mn}} \qquad \frac{.050}{1.36\sqrt{N/mn}} \qquad \frac{.020}{1.52\sqrt{N/mn}} \qquad \frac{.010}{1.63\sqrt{N/mn}}$$

Source: Adapted from P. J. Kim and R. I. Jennrich (1973), Tables of the exact sampling distribution of the two-sample Kolmogorov-Smirnov criterion $D_{mn}(m \leqslant n)$, pp. 79–170, in Institute of Mathematical Statistics, ed., *Selected Tables in Mathematical Statistics*, Vol. I, American Mathematical Society, Providence, Rhode Island, with permission.

Table J Probabilities for the Wilcoxon Rank-Sum Statistic

Each table entry labeled P is the tail probability from each extreme to the value of W_N, the Wilcoxon statistic for sample sizes m and n where $m \leq n$.

n	*Left tail*	P	*Right tail*	n	*Left tail*	P	*Right tail*	n	*Left tail*	P	*Right tail*
	$m = 1$				$m = 2$				$m = 2$		
1	1	.500	2	2	3	.167	7	8	3	.022	19
2	1	.333	3		4	.333	6		4	.044	18
	2	.667	2		5	.667	5		5	.089	17
3	1	.250	4	3	3	.100	9		6	.133	16
	2	.500	3		4	.200	8		7	.200	15
4	1	.200	5		5	.400	7		8	.267	14
	2	.400	4		6	.600	6		9	.356	13
	3	.600	3	4	3	.067	11		10	.444	12
5	1	.167	6		4	.133	10		11	.556	11
	2	.333	5		5	.267	9	9	3	.018	21
	3	.500	4		6	.400	8		4	.036	20
6	1	.143	7		7	.600	7		5	.073	19
	2	.286	6	5	3	.048	13		6	.109	18
	3	.429	5		4	.095	12		7	.164	17
	4	.571	4		5	.190	11		8	.218	16
7	1	.125	8		6	.286	10		9	.291	15
	2	.250	7		7	.429	9		10	.364	14
	3	.375	6		8	.571	8		11	.455	13
	4	.500	5	6	3	.036	15		12	.545	12
8	1	.111	9		4	.071	14	10	3	.015	23
	2	.222	8		5	.143	13		4	.030	22
	3	.333	7		6	.214	12		5	.061	21
	4	.444	6		7	.321	11		6	.091	20
	5	.556	5		8	.429	10		7	.136	19
9	1	.100	10		9	.571	9		8	.182	18
	2	.200	9	7	3	.028	17		9	.242	17
	3	.300	8		4	.056	16		10	.303	16
	4	.400	7		5	.111	15		11	.379	15
	5	.500	6		6	.167	14		12	.455	14
10	1	.091	11		7	.250	13		13	.545	13
	2	.182	10		8	.333	12				
	3	.273	9		9	.444	11				
	4	.364	8		10	.556	10				
	5	.455	7								
	6	.545	6								

(*Continued*)

Table J (*Continued*)

n	*Left tail*	P	*Right tail*	n	*Left tail*	P	*Right tail*	n	*Left tail*	P	*Right tail*
	$m = 3$				$m = 3$				$m = 4$		
3	6	.050	15	8	6	.006	30	4	10	.014	26
	7	.100	14		7	.012	29		11	.029	25
	8	.200	13		8	.024	28		12	.057	24
	9	.350	12		9	.042	27		13	.100	23
	10	.500	11		10	.067	26		14	.171	22
4	6	.029	18		11	.097	25		15	.243	21
	7	.057	17		12	.139	24		16	.343	20
	8	.114	16		13	.188	23		17	.443	19
	9	.200	15		14	.248	22		18	.557	18
	10	.314	14		15	.315	21	5	10	.008	30
	11	.429	13		16	.388	20		11	.016	29
	12	.571	12		17	.461	19		12	.032	28
5	6	.018	21		18	.539	18		13	.056	27
	7	.036	20	9	6	.005	33		14	.095	26
	8	.071	19		7	.009	32		15	.143	25
	9	.125	18		8	.018	31		16	.206	24
	10	.196	17		9	.032	30		17	.278	23
	11	.286	16		10	.050	29		18	.365	22
	12	.393	15		11	.073	28		19	.452	21
	13	.500	14		12	.105	27		20	.548	20
6	6	.012	24		13	.141	26	6	10	.005	34
	7	.024	23		14	.186	25		11	.010	33
	8	.048	22		15	.241	24		12	.019	32
	9	.083	21		16	.300	23		13	.033	31
	10	.131	20		17	.364	22		14	.057	30
	11	.190	19		18	.432	21		15	.086	29
	12	.274	18		19	.500	20		16	.129	28
	13	.357	17	10	6	.003	36		17	.176	27
	14	.452	16		7	.007	35		18	.238	26
	15	.548	15		8	.014	34		19	.305	25
7	6	.008	27		9	.024	33		20	.381	24
	7	.017	26		10	.038	32		21	.457	23
	8	.033	25		11	.056	31		22	.543	22
	9	.058	24		12	.080	30				
	10	.092	23		13	.108	29				
	11	.133	22		14	.143	28				
	12	.192	21		15	.185	27				
	13	.258	20		16	.234	26				
	14	.333	19		17	.287	25				
	15	.417	18		18	.346	24				
	16	.500	17		19	.406	23				
					20	.469	22				
					21	.531	21				

(*Continued*)

Table J (*Continued*)

n	*Left tail*	P	*Right tail*	n	*Left tail*	P	*Right tail*	n	*Left tail*	P	*Right tail*
		$m = 4$				$m = 4$				$m = 5$	
7	10	.003	38	9	10	.001	46	5	15	.004	40
	11	.006	37		11	.003	45		16	.008	39
	12	.012	36		12	.006	44		17	.016	38
	13	.021	35		13	.010	43		18	.028	37
	14	.036	34		14	.017	42		19	.048	36
	15	.055	33		15	.025	41		20	.075	35
	16	.082	32		16	.038	40		21	.111	34
	17	.115	31		17	.053	39		22	.155	33
	18	.158	30		18	.074	38		23	.210	32
	19	.206	29		19	.099	37		24	.274	31
	20	.264	28		20	.130	36		25	.345	30
	21	.324	27		21	.165	35		26	.421	29
	22	.394	26		22	.207	34		27	.500	28
	23	.464	25		23	.252	33	6	15	.002	45
	24	.536	24		24	.302	32		16	.004	44
8	10	.002	42		25	.355	31		17	.009	43
	11	.004	41		26	.413	30		18	.015	42
	12	.008	40		27	.470	29		19	.026	41
	13	.014	39		28	.530	28		20	.041	40
	14	.024	38	10	10	.001	50		21	.063	39
	15	.036	37		11	.002	49		22	.089	38
	16	.055	36		12	.004	48		23	.123	37
	17	.077	35		13	.007	47		24	.165	36
	18	.107	34		14	.012	46		25	.214	35
	19	.141	33		15	.018	45		26	.268	34
	20	.184	32		16	.027	44		27	.331	33
	21	.230	31		17	.038	43		28	.396	32
	22	.285	30		18	.053	42		29	.465	31
	23	.341	29		19	.071	41		30	.535	30
	24	.404	28		20	.094	40				
	25	.467	27		21	.120	39				
	26	.533	26		22	.152	38				
					23	.187	37				
					24	.227	36				
					25	.270	35				
					26	.318	34				
					27	.367	33				
					28	.420	32				
					29	.473	31				
					30	.527	30				

(*Continued*)

Table J (*Continued*)

n	*Left tail*	P	*Right tail*	n	*Left tail*	P	*Right tail*	n	*Left tail*	P	*Right tail*
		$m = 5$				$m = 5$				$m = 6$	
7	15	.001	50	9	15	.000	60	6	21	.001	57
	16	.003	49		16	.001	59		22	.002	56
	17	.005	48		17	.002	58		23	.004	55
	18	.009	47		18	.003	57		24	.008	54
	19	.015	46		19	.006	56		25	.013	53
	20	.024	45		20	.009	55		26	.021	52
	21	.037	44		21	.014	54		27	.032	51
	22	.053	43		22	.021	53		28	.047	50
	23	.074	42		23	.030	52		29	.066	49
	24	.101	41		24	.041	51		30	.090	48
	25	.134	40		25	.056	50		31	.120	47
	26	.172	39		26	.073	49		32	.155	46
	27	.216	38		27	.095	48		33	.197	45
	28	.265	37		28	.120	47		34	.242	44
	29	.319	36		29	.149	46		35	.294	43
	30	.378	35		30	.182	45		36	.350	42
	31	.438	34		31	.219	44		37	.409	41
	32	.500	33		32	.259	43		38	.469	40
8	15	.001	55		33	.303	42		39	.531	39
	16	.002	54		34	.350	41	7	21	.001	63
	17	.003	53		35	.399	40		22	.001	62
	18	.005	52		36	.449	39		23	.002	61
	19	.009	51		37	.500	38		24	.004	60
	20	.015	50	10	15	.000	65		25	.007	59
	21	.023	49		16	.001	64		26	.011	58
	22	.033	48		17	.001	63		27	.017	57
	23	.047	47		18	.002	62		28	.026	56
	24	.064	46		19	.004	61		29	.037	55
	25	.085	45		20	.006	60		30	.051	54
	26	.111	44		21	.010	59		31	.069	53
	27	.142	43		22	.014	58		32	.090	52
	28	.177	42		23	.020	57		33	.117	51
	29	.218	41		24	.028	56		34	.147	50
	30	.262	40		25	.038	55		35	.183	49
	31	.311	39		26	.050	54		36	.223	48
	32	.362	38		27	.065	53		37	.267	47
	33	.416	37		28	.082	52		38	.314	46
	34	.472	36		29	.103	51		39	.365	45
	35	.528	35		30	.127	50		40	.418	44
					31	.155	49		41	.473	43
					32	.0185	48		42	.527	42
					33	.220	47				
					34	.257	46				
					35	.297	45				
					36	.339	44				
					37	.384	43				
					38	.430	42				
					39	.477	41				
					40	.523	40				

(*Continued*)

Table J (*Continued*)

n	*Left tail*	P	*Right tail*	n	*Left tail*	P	*Right tail*	n	*Left tail*	P	*Right tail*
		$m = 6$				$m = 6$				$m = 7$	
8	21	.000	69	9	41	.228	55	7	28	.000	77
	22	.001	68		42	.264	54		29	.001	76
	23	.001	67		43	.303	53		30	.001	75
	24	.002	66		44	.344	52		31	.002	74
	25	.004	65		45	.388	51		32	.003	73
	26	.006	64		46	.432	50		33	.006	72
	27	.010	63		47	.477	49		34	.009	71
	28	.015	62		48	.523	48		35	.013	70
	29	.021	61	10	21	.000	81		36	.019	69
	30	.030	60		22	.000	80		37	.027	68
	31	.041	59		23	.000	79		38	.036	67
	32	.054	58		24	.001	78		39	.049	66
	33	.071	57		25	.001	77		40	.064	65
	34	.091	56		26	.002	76		41	.082	64
	35	.114	55		27	.004	75		42	.104	63
	36	.141	54		28	.005	74		43	.130	62
	37	.172	53		29	.008	73		44	.159	61
	38	.207	52		30	.011	72		45	.191	60
	39	.245	51		31	.016	71		46	.228	59
	40	.286	50		32	.021	70		47	.267	58
	41	.331	49		33	.028	69		48	.310	57
	42	.377	48		34	.036	68		49	.355	56
	43	.426	47		35	.047	67		50	.402	55
	44	.475	46		36	.059	66		51	.451	54
	45	.525	45		37	.074	65		52	.500	53
9	21	.000	75		38	.090	64	8	28	.000	84
	22	.000	74		39	.110	63		29	.000	83
	23	.001	73		40	.132	62		30	.001	82
	24	.001	72		41	.157	61		31	.001	81
	25	.002	71		42	.184	60		32	.002	80
	26	.004	70		43	.214	59		33	.003	79
	27	.006	69		44	.246	58		34	.005	78
	28	.009	68		45	.281	57		35	.007	77
	29	.013	67		46	.318	56		36	.010	76
	30	.018	66		47	.356	55		37	.014	75
	31	.025	65		48	.396	54		38	.020	74
	32	.033	64		49	.437	53		39	.027	73
	33	.044	63		50	.479	52		40	.036	72
	34	.057	62		51	.521	51		41	.047	71
	35	.072	61						42	.060	70
	36	.091	60						43	.076	69
	37	.112	59						44	.095	68
	38	.136	58						45	.116	67
	39	.164	57						46	.140	66
	40	.194	56						47	.168	65

(*Continued*)

Table J (*Continued*)

n	*Left tail*	P	*Right tail*	n	*Left tail*	P	*Right tail*	n	*Left tail*	P	*Right tail*
		$m = 7$				$m = 7$				$m = 8$	
8	48	.198	64	10	28	.000	98	8	36	.000	100
	49	.232	63		29	.000	97		37	.000	99
	50	.268	62		30	.000	96		38	.000	98
	51	.306	61		31	.000	95		39	.001	97
	52	.347	60		32	.001	94		40	.001	96
	53	.389	59		33	.001	93		41	.001	95
	54	.433	58		34	.002	92		42	.002	94
	55	.478	57		35	.002	91		43	.003	93
	56	.522	56		36	.003	90		44	.005	92
9	28	.000	91		37	.005	89		45	.007	91
	29	.000	90		38	.007	88		46	.010	90
	30	.000	89		39	.009	87		47	.014	89
	31	.001	88		40	.012	86		48	.019	88
	32	.001	87		41	.017	85		49	.025	87
	33	.002	86		42	.022	84		50	.032	86
	34	.003	85		43	.028	83		51	.041	85
	35	.004	84		44	.035	82		52	.052	84
	36	.006	83		45	.044	81		53	.065	83
	37	.008	82		46	.054	80		54	.080	82
	38	.011	81		47	.067	79		55	.097	81
	39	.016	80		48	.081	78		56	.117	80
	40	.021	79		49	.097	77		57	.139	79
	41	.027	78		50	.115	76		58	.164	78
	42	.036	77		51	.135	75		59	.191	77
	43	.045	76		52	.157	74		60	.221	76
	44	.057	75		53	.182	73		61	.253	75
	45	.071	74		54	.209	72		62	.287	74
	46	.087	73		55	.237	71		63	.323	73
	47	.105	72		56	.268	70		64	.360	72
	48	.126	71		57	.300	69		65	.399	71
	49	.150	70		58	.335	68		66	.439	70
	50	.176	69		59	.370	67		67	.480	69
	51	.204	68		60	.406	66		68	.520	68
	52	.235	67		61	.443	65	9	36	.000	108
	53	.268	66		62	.481	64		37	.000	107
	54	.303	65		63	.519	63		38	.000	106
	55	.340	64						39	.000	105
	56	.379	63						40	.000	104
	57	.419	62						41	.001	103
	58	.459	61						42	.001	102
	59	.500	60						43	.002	101

(*Continued*)

Table J (*Continued*)

n	*Left tail*	P	*Right tail*	n	*Left tail*	P	*Right tail*	n	*Left tail*	P	*Right tail*
		$m = 8$				$m = 8$				$m = 9$	
9	44	.003	100	10	36	.000	116	9	45	.000	126
	45	.004	99		37	.000	115		46	.000	125
	46	.006	98		38	.000	114		47	.000	124
	47	.008	97		39	.000	113		48	.000	123
	48	.010	96		40	.000	112		49	.000	122
	49	.014	95		41	.000	111		50	.000	121
	50	.018	94		42	.001	110		51	.001	120
	51	.023	93		43	.001	109		52	.001	119
	52	.030	92		44	.002	108		53	.001	118
	53	.037	91		45	.002	107		54	.002	117
	54	.046	90		46	.003	106		55	.003	116
	55	.057	89		47	.004	105		56	.004	115
	56	.069	88		48	.006	104		57	.005	114
	57	.084	87		49	.008	103		58	.007	113
	58	.100	86		50	.010	102		59	.009	112
	59	.118	85		51	.013	101		60	.012	111
	60	.138	84		52	.017	100		61	.016	110
	61	.161	83		53	.022	99		62	.020	109
	62	.185	82		54	.027	98		63	.025	108
	63	.212	81		55	.034	97		64	.031	107
	64	.240	80		56	.042	96		65	.039	106
	65	.271	79		57	.051	95		66	.047	105
	66	.303	78		58	.061	94		67	.057	104
	67	.336	77		59	.073	93		68	.068	103
	68	.371	76		60	.086	92		69	.081	102
	69	.407	75		61	.102	91		70	.095	101
	70	.444	74		62	.118	90		71	.111	100
	71	.481	73		63	.137	89		72	.129	99
	72	.519	72		64	.158	88		73	.149	98
					65	.180	87		74	.170	97
					66	.204	86		75	.193	96
					67	.230	85		76	.218	95
					68	.257	84		77	.245	94
					69	.286	83		78	.273	93
					70	.317	82		79	.302	92
					71	.348	81		80	.333	91
					72	.381	80		81	.365	90
					73	.414	79		82	.398	89
					74	.448	78		83	.432	88
					75	.483	77		84	.466	87
					76	.517	76		85	.500	86

(*Continued*)

Table J (*Continued*)

n	*Left tail*	P	*Right tail*	n	*Left tail*	P	*Right tail*	n	*Left tail*	P	*Right tail*
	$m = 9$				$m = 9$				$m = 10$		
10	45	.000	135	10	78	.178	102	10	73	.007	137
	46	.000	134		79	.200	101		74	.009	136
	47	.000	133		80	.223	100		75	.012	135
	48	.000	132		81	.248	99		76	.014	134
	49	.000	131		82	.274	98		77	.018	133
	50	.000	130		83	.302	97		78	.022	132
	51	.000	129		84	.330	96		79	.026	131
	52	.000	128		85	.360	95		80	.032	130
	53	.001	127		86	.390	94		81	.038	129
	54	.001	126		87	.421	93		82	.045	128
	55	.001	125		88	.452	92		83	.053	127
	56	.002	124		89	.484	91		84	.062	126
	57	.003	123		90	.516	90		85	.072	125
	58	.004	122						86	.083	124
	59	.005	121						87	.095	123
	60	.007	120			$m = 10$			88	.109	122
	61	.009	119						89	.124	121
	62	.011	118	10	55	.000	155		90	.140	120
	63	.014	117		56	.000	154		91	.157	119
	64	.017	116		57	.000	153		92	.176	118
	65	.022	115		58	.000	152		93	.197	117
	66	.027	114		59	.000	151		94	.218	116
	67	.033	113		60	.000	150		95	.241	115
	68	.039	112		61	.000	149		96	.264	114
	69	.047	111		62	.000	148		97	.289	113
	70	.056	110		63	.000	147		98	.315	112
	71	.067	109		64	.001	146		99	.342	111
	72	.078	108		65	.001	145		100	.370	110
	73	.091	107		66	.001	144		101	.398	109
	74	.106	106		67	.001	143		102	.427	108
	75	.121	105		68	.002	142		103	.456	107
	76	.139	104		69	.003	141		104	.485	106
	77	.158	103		70	.003	140		105	.515	105
					71	.004	139				
					72	.006	138				

Source: Adapted from F. Wilcoxon, S. K. Katti, and R. A. Wilcox (1973), Critical values and probability levels for the Wilcoxon rank sum test and the Wilcoxon signed rank test, pp. 172–259, in Institute of Mathematical Statistics, ed., *Selected Tables in Mathematical Statistics*, vol. I, American Mathematical Society, Providence, Rhode Island, with permission.

Table K Kruskal-Wallis Test Statistic

Each table entry is the smallest value of the Kruskal-Wallis H such that its right-tail probability is less than or equal to the value given on the top row for $k = 3$, each sample size less than or equal to 5.

	Right-tail probability for H				
n_1, n_2, n_3	*0.100*	*0.050*	*0.020*	*0.010*	*0.001*
2, 2, 2	4.571	—	—	—	—
3, 2, 1	4.286	—	—	—	—
3, 2, 2	4.500	4.714	—	—	—
3, 3, 1	4.571	5.143	—	—	—
3, 3, 2	4.556	5.361	6.250	—	—
3, 3, 3	4.622	5.600	6.489	7.200	—
4, 2, 1	4.500	—	—	—	—
4, 2, 2	4.458	5.333	6.000	—	—
4, 3, 1	4.056	5.208	—	—	—
4, 3, 2	4.511	5.444	6.144	6.444	—
4, 3, 3	4.709	5.791	6.564	6.745	—
4, 4, 1	4.167	4.967	6.667	6.667	—
4, 4, 2	4.555	5.455	6.600	7.036	—
4, 4, 3	4.545	5.598	6.712	7.144	8.909
4, 4, 4	4.654	5.692	6.962	7.654	9.269
5, 2, 1	4.200	5.000	—	—	—
5, 2, 2	4.373	5.160	6.000	6.533	—
5, 3, 1	4.018	4.960	6.044	—	—
5, 3, 2	4.651	5.251	6.124	6.909	—
5, 3, 3	4.533	5.648	6.533	7.079	8.727
5, 4, 1	3.987	4.985	6.431	6.955	—
5, 4, 2	4.541	5.273	6.505	7.205	8.591
5, 4, 3	4.549	5.656	6.676	7.445	8.795
5, 4, 4	4.668	5.657	6.953	7.760	9.168
5, 5, 1	4.109	5.127	6.145	7.309	—
5, 5, 2	4.623	5.338	6.446	7.338	8.938
5, 5, 3	4.545	5.705	6.866	7.578	9.284
5, 5, 4	4.523	5.666	7.000	7.823	9.606
5, 5, 5	4.560	5.780	7.220	8.000	9.920

For $k>3$, right-tail probabilities on H are found from Table B with $k-1$ degrees of freedom.

Source: Adapted from R. L. Iman, D. Quade, and D. A. Alexander (1975), Exact probability levels for the Kruskal-Wallis test, pp. 329–384, in Institute of Mathematical Statistics ed., *Selected Tables in Mathematical Statistics*, vol. III, American Mathematical Society, Providence, Rhode Island, with permission.

Table L Kendall's Tau Statistic

Each table entry labelled P is the right-tail probability for T, the Kendall tau statistic for sample size n, and also the left-tail probability for $-T$. The second portion of the table gives the value of $T(-T)$ such that its right (left-tail) probability is the value given in the top row.

n	T	P	n	T	P	n	T	P	n	T	P
3	1.000	.167	7	1.000	.000	9	1.000	.000	10	1.000	.000
	.333	.500		.905	.001		.944	.000		.956	.000
4	1.000	.042		.810	.005		.889	.000		.911	.000
	.667	.167		.714	.015		.833	.000		.867	.000
	.333	.375		.619	.035		.778	.001		.822	.000
	.000	.625		.524	.068		.722	.003		.778	.000
5	1.000	.008		.429	.119		.667	.006		.733	.001
	.800	.042		.333	.191		.611	.012		.689	.002
	.600	.117		.238	.281		.556	.022		.644	.005
	.400	.242		.143	.386		.500	.038		.600	.008
	.200	.408		.048	.500		.444	.060		.556	.014
	.000	.592	8	1.000	.000		.389	.090		.511	.023
6	1.000	.001		.929	.000		.333	.130		.467	.036
	.867	.008		.857	.001		.278	.179		.422	.054
	.733	.028		.786	.003		.222	.238		.378	.078
	.600	.068		.714	.007		.167	.306		.333	.108
	.467	.136		.643	.016		.111	.381		.289	.146
	.333	.235		.571	.031		.056	.460		.244	.190
	.200	.360		.500	.054		.000	.540		.200	.242
	.067	.500		.429	.089					.156	.300
				.357	.138					.111	.364
				.286	.199					.067	.431
				.214	.274					.022	.500
				.143	.360						
				.071	.452						
				.000	.548						

(*Continued*)

Table L (*Continued*)

n	*.100*	*.050*	*.025*	*.010*	*.005*
11	.345	.418	.491	.564	.600
12	.303	.394	.455	.545	.576
13	.308	.359	.436	.513	.564
14	.275	.363	.407	.473	.516
15	.276	.333	.390	.467	.505
16	.250	.317	.383	.433	.483
17	.250	.309	.368	.426	.471
18	.242	.294	.346	.412	.451
19	.228	.287	.333	.392	.439
20	.221	.274	.326	.379	.421
21	.210	.267	.314	.371	.410
22	.203	.264	.307	.359	.394
23	.202	.257	.296	.352	.391
24	.196	.246	.290	.341	.377
25	.193	.240	.287	.333	.367
26	.188	.237	.280	.329	.360
27	.179	.231	.271	.322	.356
28	.180	.228	.265	.312	.344
29	.172	.222	.261	.310	.340
30	.172	.218	.255	.301	.333

Source: The tail probabilities ($n \leqslant 10$) are adapted from M. G. Kendall (1948, 4th ed. 1970), *Rank Correlation Methods*, Charles Griffin & Co., Ltd., London and High Wycombe, with permission. The quantiles ($11 \leqslant n \leqslant 30$) are adapted from L. Kaarsemaker and A. van Wijngaarden (1953), Tables for use in rank correlation, *Statistica Neerlandica*, **7**, 41–54, with permission.

Table M Spearman's Coefficient of Rank Correlation

Each table entry labeled P is the right-tail probability for R, Spearman's coefficient of rank correlation for sample size n, and also the left-tail probability for $-R$. The second portion of he table gives the value of $R(-R)$ such that its right-tail (left-tail) probability is the value given on the top row.

n	R	P	n	R	P	n	R	P	n	R	P
3	1.000	.167	7	1.000	.000	8	.810	.011	9	1.000	.000
	.500	.500		.964	.001		.786	.014		.983	.000
4	1.000	.042		.929	.003		.762	.018		.967	.000
	.800	.167		.893	.006		.738	.023		.950	.000
	.600	.208		.857	.012		.714	.029		.933	.000
	.400	.375		.821	.017		.690	.035		.917	.001
	.200	.458		.786	.024		.667	.042		.900	.001
	.000	.542		.750	.033		.643	.048		.883	.002
5	1.000	.008		.714	.044		.619	.057		.867	.002
	.900	.042		.679	.055		.595	.066		.850	.003
	.800	.067		.643	.069		.571	.076		.833	.004
	.700	.117		.607	.083		.548	.085		.817	.005
	.600	.175		.571	.100		.524	.098		.800	.007
	.500	.225		.536	.118		.500	.108		.783	.009
	.400	.258		.500	.133		.476	.122		.767	.011
	.300	.342		.464	.151		.452	.134		.750	.013
	.200	.392		.429	.177		.429	.150		.733	.016
	.100	.475		.393	.198		.405	.163		.717	.018
	.000	.525		.357	.222		.381	.180		.700	.022
6	1.000	.001		.321	.249		.357	.195		.683	.025
	.943	.008		.286	.278		.333	.214		.667	.029
	.886	.017		.250	.297		.310	.231		.650	.033
	.829	.029		.214	.331		.286	.250		.633	.038
	.771	.051		.179	.357		.262	.268		.617	.043
	.714	.068		.143	.391		.238	.291		.600	.048
	.657	.088		.107	.420		.214	.310		.583	.054
	.600	.121		.071	.453		.190	.332		.567	.060
	.543	.149		.036	.482		.167	.352		.550	.066
	.486	.178		.000	.518		.143	.376		.533	.074
	.429	.210	8	1.000	.000		.119	.397		.517	.081
	.371	.249		.976	.000		.095	.420		.500	.089
	.314	.282		.952	.001		.071	.441		.483	.097
	.257	.329		.929	.001		.048	.467		.467	.106
	.200	.357		.905	.002		.024	.488		.450	.115
	.143	.401		.881	.004		.000	.512		.433	.125
	.086	.460		.857	.005					.417	.135
	.029	.500		.833	.008					.400	.146

(*Continued*)

Table M (*Continued*)

n	R	P	n	R	P	n	R	P	n	R	P
9	.383	.156	10	.964	.000	10	.636	.027	10	.309	.193
	.367	.168		.952	.000		.624	.030		.297	.203
	.350	.179		.939	.000		.612	.033		.285	.214
	.333	.193		.927	.000		.600	.037		.273	.224
	.317	.205		.915	.000		.588	.040		.261	.235
	.300	.218		.903	.000		.576	.044		.248	.246
	.283	.231		.891	.001		.564	.048		.236	.257
	.267	.247		.879	.001		.552	.052		.224	.268
	.250	.260		.867	.001		.539	.057		.212	.280
	.233	.276		.855	.001		.527	.062		.200	.292
	.217	.290		.842	.002		.515	.067		.188	.304
	.200	.307		.830	.002		.503	.072		.176	.316
	.183	.322		.818	.003		.491	.077		.164	.328
	.167	.339		.806	.004		.479	.083		.152	.341
	.150	.354		.794	.004		.467	.089		.139	.354
	.133	.372		.782	.005		.455	.096		.127	.367
	.117	.388		.770	.007		.442	.102		.115	.379
	.100	.405		.758	.008		.430	.109		.103	.393
	.083	.422		.745	.009		.418	.116		.091	.406
	.067	.440		.733	.010		.406	.124		.079	.419
	.050	.456		.721	.012		.394	.132		.067	.433
	.033	.474		.709	.013		.382	.139		.055	.446
	.017	.491		.697	.015		.370	.148		.042	.459
	.000	.509		.685	.017		.358	.156		.030	.473
10	1.000	.000		.673	.019		.345	.165		.018	.486
	.988	.000		.661	.022		.333	.174		.006	.500
	.976	.000		.648	.025		.321	.184			

(*Continued*)

Table M (*Continued*)

n	*.100*	*.050*	*.025*	*.010*	*.005*	*.001*
11	.427	.536	.618	.709	.764	.855
12	.406	.503	.587	.678	.734	.825
13	.385	.484	.560	.648	.703	.797
14	.367	.464	.538	.626	.679	.771
15	.354	.446	.521	.604	.657	.750
16	.341	.429	.503	.585	.635	.729
17	.329	.414	.488	.566	.618	.711
18	.317	.401	.474	.550	.600	.692
19	.309	.391	.460	.535	.584	.675
20	.299	.380	.447	.522	.570	.660
21	.292	.370	.436	.509	.556	.647
22	.284	.361	.425	.497	.544	.633
23	.278	.353	.416	.486	.532	.620
24	.275	.344	.407	.476	.521	.608
25	.265	.337	.398	.466	.511	.597
26	.260	.331	.390	.457	.501	.586
27	.255	.324	.383	.449	.492	.576
28	.250	.318	.376	.441	.483	.567
29	.245	.312	.369	.433	.475	.557
30	.241	.307	.363	.426	.467	.548

Source: The tail probabilities ($n \leqslant 10$) are adapted from M. G. Kendall (1948, 4th ed. 1970), *Rank Correlation Methods,* Charles Griffin & Co., Ltd., London and High Wycombe, with permission. The quantiles ($11 \leqslant n \leqslant 30$) are adapted from G. J. Glasser and R. F. Winter (1961), Critical values of the rank correlation coefficient for testing the hypothesis of independence, *Biometrika*, **48**, 444–448, with permission of the Biometrika Trustees and the authors.

Table N Friedman's Analysis-of-Variance Statistic and Kendall's Coefficient of Concordance

Each table entry labeled P is the right-tail probability for the sum of squares S used in Friedman's analysis-of-variance statistic with n treatments and k blocks and in Kendall's coefficient of concordance with k sets of ranking of n objects.

n	k	S	P	n	k	S	P	n	k	S	P	n	k	S	P
3	2	8	.167	3	7	98	.000	4	2	20	.042	4	4	80	.000
		6	.500			96	.000			18	.167			78	.001
	3	18	.028			86	.000			16	.208			76	.001
		14	.194			78	.001			14	.375			74	.001
		8	.361			74	.003			12	.458			72	.002
	4	32	.005			72	.004		3	45	.002			70	.003
		26	.042			62	.008			43	.002			68	.003
		24	.069			56	.016			41	.017			66	.006
		18	.125			54	.021			37	.033			64	.007
		14	.273			50	.027			35	.054			62	.012
		8	.431			42	.051			33	.075			58	.014
	5	50	.001			38	.085			29	.148			56	.019
		42	.008			32	.112			27	.175			54	.033
		38	.024			26	.192			25	.207			52	.036
		32	.039			24	.237			21	.300			50	.052
		26	.093			18	.305			19	.342			48	.054
		24	.124			14	.486			17	.446			46	.068
		18	.182		8	128	.000							44	.077
		14	.367			126	.000							42	.094
	6	72	.000			122	.000							40	.105
		62	.002			114	.000							38	.141
		56	.006			104	.000							36	.158
		54	.008			98	.001							34	.190
		50	.012			96	.001							32	.200
		42	.029			86	.002							30	.242
		38	.052			78	.005							26	.324
		32	.072			74	.008							24	.355
		26	.142			72	.010							22	.389
		24	.184			62	.018							20	.432
		18	.252			56	.030								
		14	.430			54	.038								
						50	.047								
						42	.079								
						38	.120								
						32	.149								
						26	.236								
						24	.285								
						18	.355								

Source: Adapted from M. G. Kendall (1948, 4th ed. 1970), *Rank Correlation Methods*, Charles Griffin & Co., Ltd., London and High Wycombe, with permission.

Table O Lilliefors's Test for Normal Distribution Critical Values

Table entries for any sample size N are the values of a Lilliefors's random variable with right-tail probability as given in the top row.

Sample Size (N)	*Significance level*			
	0.100	*0.05*	*0.010*	*0.001*
4	.344	.375	.414	.432
5	.320	.344	.398	.427
6	.298	.323	.369	.421
7	.281	.305	.351	.399
8	.266	.289	.334	.383
9	.252	.273	.316	.366
10	.240	.261	.305	.350
11	.231	.251	.291	.331
12	.223	.242	.281	.327
14	.208	.226	.262	.302
16	.195	.213	.249	.291
18	.185	.201	.234	.272
20	.176	.192	.223	.266
25	.159	.173	.202	.236
30	.146	.159	.186	.219
40	.127	.139	.161	.190
50	.114	.125	.145	.173
60	.105	.114	.133	.159
75	.094	.102	.119	.138
100	.082	.089	.104	.121
Over 100	$.816/\sqrt{N}$	$.888/\sqrt{N}$	$1.038/\sqrt{N}$	$1.212/\sqrt{N}$

Source: Adapted from R. L. Edgeman and R. C. Scott (1987), Lilliefors's tests for transformed variables, *Brazilian Journal of Probability and Statistics*, **1**, 101–112, with permission.

Table P Significance Points of $T_{XY.Z}$ (*for Kendall's Partial Rank-Correlation Coefficient*)

	One-tailed level of significance			
m	*0.005*	*0.01*	*0.025*	*0.05*
3	1	1	1	1
4	1	1	1	0.707
5	1	0.816	0.802	0.667
6	0.866	0.764	0.667	0.600
7	0.761	0.712	0.617	0.527
8	0.713	0.648	0.565	0.484
9	0.660	0.602	0.515	0.443
10	0.614	0.562	0.480	0.413
11	0.581	0.530	0.453	0.387
12	0.548	0.505	0.430	0.365
13	0.527	0.481	0.410	0.347
14	0.503	0.458	0.391	0.331
15	0.482	0.439	0.375	0.317
16	0.466	0.423	0.361	0.305
17	0.450	0.410	0.348	0.294
18	0.434	0.395	0.336	0.284
19	0.421	0.382	0.326	0.275
20	0.410	0.372	0.317	0.267
25	0.362	0.328	0.278	0.235
30	0.328	0.297	0.251	0.211

Source: Adapted from S. Maghsoodloo (1975), Estimates of the quantiles of Kendall's partial rank correlation coefficient and additional quantile estimates, *Journal of Statistical Computation and Simulation*, **4**, 155–164, and S. Maghsoodloo, and L. L. Pallos (1981), Asymptotic behavior of Kendall's partial rank correlation coefficient and additional quantile estimates, *Journal of Statistical Computation and Simulation*, **13**, 41–48, with permission.

Table Q Page's *L* Statistic

Each table entry for n treatments and k blocks is the value of L such that its right-tail probability is less than or equal to 0.001 for the upper number, 0.01 for the middle number, and 0.05 for the lower number.

	n					
k	*3*	*4*	*5*	*6*	*7*	*8*
			109	178	269	388
2		60	106	173	261	376
	28	58	103	166	252	362
		89	160	260	394	567
3	42	87	155	252	382	549
	41	84	150	244	370	532
	56	117	210	341	516	743
4	55	114	204	331	501	722
	54	111	197	321	487	701
	70	145	259	420	637	917
5	68	141	251	409	620	893
	66	137	244	397	603	869
	83	172	307	499	757	1090
6	81	167	299	486	737	1063
	79	163	291	474	719	1037
	96	198	355	577	876	1262
7	93	193	346	563	855	1232
	91	189	338	550	835	1204
	109	225	403	655	994	1433
8	106	220	383	640	972	1401
	104	214	384	625	950	1371
	121	252	451	733	1113	1603
9	119	246	441	717	1088	1569
	116	240	431	701	1065	1537
	134	278	499	811	1230	1773
10	131	272	487	793	1205	1736
	128	266	477	777	1180	1703
	147	305	546	888	1348	1943
11	144	298	534	869	1321	1905
	141	292	523	852	1295	1868
	160	331	593	965	1465	2112
12	156	324	581	946	1437	2072
	153	317	570	928	1410	2035

Source: Adapted from E. P. Page (1963), Ordered hypotheses for multiple treatments: A significance test for linear ranks, *Journal of the American Statistical Association*, **58**, 216–230, with permission.

Table R Critical Values and Associated Probabilities for the Jonckheere-Terpstra Test

Each entry is the critical value $B_\alpha = B(\alpha, k, n_1, n_2, \ldots, n_k)$ of a Jonckheere-Terpstra statistic B for given $\alpha, k, n, n_2, \ldots, n_k$, such that $P(B \geq B_\alpha | H_o) \leq \alpha$. The actual right-tail probability is equal to the value given in parentheses.

			$k = 3$											
n_1	n_2	n_3	$\alpha = 0.5$		$\alpha = 0.2$		$\alpha = 0.1$		$\alpha = 0.05$		$\alpha = 0.025$		$\alpha = 0.01$		$\alpha = 0.005$	
2	2	2	7	(.42222)	9	(.16667)	10	(.08889)	11	(.03333)	12	(.01111)	—		—	
2	2	3	9	(.43810)	12	(.13810)	13	(.07619)	14	(.03810)	15	(.01429)	16	(.00476)	16	(.00476)
2	2	4	11	(.44762)	14	(.18095)	16	(.07143)	17	(.03810)	18	(.01905)	19	(.00714)	20	(.00238)
2	2	5	13	(.45503)	17	(.15344)	19	(.06614)	20	(.03968)	21	(.02116)	23	(.00397)	23	(.00397)
2	2	6	15	(.46032)	19	(.18492)	21	(.09444)	23	(.03968)	24	(.02381)	26	(.00635)	27	(.00238)
2	2	7	17	(.46465)	22	(.16364)	24	(.08788)	26	(.04040)	28	(.01515)	29	(.00808)	30	(.00404)
2	2	8	19	(.46801)	24	(.18855)	27	(.08215)	29	(.04040)	31	(.01684)	33	(.00539)	34	(.00269)
2	3	3	12	(.40000)	15	(.15179)	16	(.09643)	18	(.03036)	19	(.01429)	20	(.00536)	21	(.00179)
2	3	4	14	(.45714)	18	(.16190)	20	(.07381)	21	(.04524)	23	(.01349)	24	(.00635)	25	(.00138)
2	3	5	17	(.42500)	21	(.16944)	23	(.08770)	25	(.03810)	26	(.02302)	28	(.00675)	29	(.00317)
2	3	6	19	(.46645)	24	(.17554)	26	(.09957)	28	(.04957)	30	(.02100)	32	(.00714)	33	(.00368)
2	3	7	22	(.44003)	27	(.18030)	30	(.08232)	32	(.04268)	34	(.01032)	36	(.00732)	37	(.00368)
2	3	8	24	(.47273)	30	(.18430)	33	(.09192)	36	(.03768)	38	(.01810)	40	(.00754)	41	(.00451)
2	4	4	17	(.46254)	21	(.19810)	24	(.07556)	26	(.03206)	27	(.01905)	29	(.00540)	30	(.00254)
2	4	5	20	(.46739)	25	(.18095)	28	(.07662)	30	(.03680)	31	(.02395)	33	(.00880)	34	(.00491)
2	4	6	23	(.47071)	29	(.16797)	32	(.07742)	34	(.04076)	36	(.01898)	38	(.00758)	39	(.00440)
2	4	7	26	(.47366)	32	(.19305)	36	(.07797)	38	(.04406)	40	(.02261)	43	(.00660)	44	(.00408)
2	4	8	29	(.47590)	36	(.18077)	39	(.09879)	42	(.04686)	45	(.01863)	47	(.00892)	49	(.00377)
2	5	5	24	(.44228)	29	(.19000)	32	(.09157)	35	(.03565)	36	(.02453)	39	(.00643)	40	(.00373)
2	5	6	27	(.47403)	33	(.19708)	37	(.08178)	39	(.04715)	41	(.02486)	44	(.00777)	45	(.00491)
2	5	7	31	(.45303)	38	(.17057)	41	(.09355)	44	(.04477)	47	(.01820)	49	(.00894)	51	(.00393)
2	5	8	34	(.47849)	42	(.17764)	46	(.08500)	49	(.04283)	52	(.01885)	54	(.00996)	56	(.00482)
2	6	6	31	(.47662)	38	(.18816)	42	(.08528)	45	(.04027)	47	(.02235)	50	(.00786)	52	(.00343)

2	6	7	35	(.47875)	43	(.18087)	47	(.08803)	50	(.04521)	53	(.02040)	56	(.00789)	58	(.00376)
2	6	8	39	(.48051)	48	(.17491)	52	(.09031)	55	(.04953)	58	(.02449)	62	(.00788)	64	(.00404)
2	7	7	40	(.46130)	48	(.18948)	53	(.08358)	56	(.04543)	59	(.02225)	62	(.00964)	65	(.00360)
2	7	8	44	(.48219)	53	(.19675)	58	(.09468)	62	(.04555)	65	(.02381)	69	(.00857)	71	(.00474)
2	8	8	49	(.48359)	59	(.19248)	64	(.09833)	69	(.04231)	72	(.02319)	76	(.00913)	79	(.00404)
3	3	3	15	(.41548)	18	(.19405)	20	(.09464)	22	(.03690)	23	(.02083)	25	(.00476)	25	(.00476)
3	3	4	18	(.42667)	22	(.17500)	24	(.09310)	26	(.04214)	28	(.01548)	29	(.00857)	30	(.00429)
3	3	5	21	(.43528)	26	(.16147)	28	(.09177)	30	(.04621)	32	(.02002)	34	(.00714)	35	(.00390)
3	3	6	24	(.44210)	29	(.18912)	32	(.09075)	34	(.04946)	36	(.02408)	39	(.00622)	40	(.00357)
3	3	7	27	(.44761)	33	(.17619)	36	(.08989)	39	(.03849)	41	(.01941)	43	(.00868)	45	(.00335)
3	3	8	30	(.45216)	36	(.19843)	40	(.08914)	43	(.04144)	45	(.02259)	48	(.00759)	49	(.00498)
3	4	4	21	(.46779)	26	(.18528)	29	(.08043)	31	(.03974)	33	(.01688)	35	(.00589)	36	(.00320)
3	4	5	25	(.44304)	30	(.19325)	33	(.09481)	36	(.03791)	38	(.01789)	40	(.00732)	41	(.00440)
3	4	6	28	(.47434)	34	(.19973)	38	(.08432)	40	(.04923)	43	(.01865)	45	(.00856)	47	(.00343)
3	4	7	32	(.45344)	39	(.17279)	42	(.09566)	45	(.04644)	48	(.01926)	50	(.00963)	52	(.00435)
3	4	8	35	(.47863)	43	(.17947)	47	(.08672)	50	(.04419)	53	(.01974)	56	(.00752	58	(.00354)
3	5	5	29	(.44913)	35	(.18365)	38	(.09706)	41	(.04382)	43	(.02324)	46	(.00740)	47	(.00475)
3	5	6	33	(.45405)	40	(.17607)	43	(.09882)	46	(.04890)	49	(.02085)	52	(.00741)	54	(.00328)
3	5	7	37	(.45809)	44	(.19851)	49	(.08220)	52	(.04211)	55	(.01903)	58	(.00740)	60	(.00356)
3	5	8	41	(.46147)	49	(.19057)	54	(.08461)	57	(.04627)	60	(.02284)	64	(.00737)	66	(.00380)
3	6	6	37	(.47913)	45	(.18533)	49	(.09226)	52	(.04855)	55	(.02267)	58	(.00919)	60	(.00459)
3	6	7	42	(.46187)	50	(.19315)	55	(.08704)	58	(.04821)	61	(.02420)	65	(.00807)	67	(.00425)

(*Continued*)

Table R (*Continued*)

			$k=3$											
n_1	n_2	n_3	$\alpha = 0.5$		$\alpha = 0.2$		$\alpha = 0.1$		$\alpha = 0.05$		$\alpha = 0.025$		$\alpha = 0.01$		$\alpha = 0.005$	
3	6	8	46	(.48241)	55	(.19983)	60	(.09770)	64	(.04788)	68	(.02027)	71	(.00950)	74	(.00397)
3	7	7	47	(.46502)	56	(.18868)	61	(.09112)	65	(.04421)	68	(.02337)	72	(.00861)	74	(.00486)
3	7	8	52	(.46769)	62	(.18490)	67	(.09460)	71	(.04917)	75	(.02265)	79	(.00907)	82	(.00410)
3	8	8	57	(.48503)	68	(.19289)	74	(.09197)	79	(.04251)	82	(.02477)	87	(.00869)	90	(.00418)
4	4	4	25	(.47160)	31	(.17558)	34	(.08439)	36	(.04632)	38	(.02286)	40	(.00993)	42	(.00367)
4	4	5	29	(.47465)	36	(.16825)	39	(.08738)	42	(.03873)	44	(.02027)	46	(.00959)	48	(.00402)
4	4	6	33	(.47708)	40	(.19294)	44	(.08984)	47	(.04376)	49	(.02497)	52	(.00931)	54	(.00429)
4	4	7	37	(.47909)	45	(.18488)	49	(.09184)	52	(.04822)	55	(.02244)	58	(.00906)	60	(.00450)
4	4	8	41	(.48077)	50	(.17830)	54	(.09353)	58	(.04204)	61	(.02049)	64	(.00885)	66	(.00468)
4	5	5	34	(.45453)	41	(.17872)	45	(.08177)	48	(.03928)	50	(.02220)	53	(.00815)	55	(.00371)
4	5	6	38	(.47932)	46	(.18750)	50	(.09435)	54	(.03970)	56	(.02382)	59	(.00987)	62	(.00347)
4	5	7	43	(.46215)	51	(.19494)	56	(.08875)	59	(.04959)	63	(.01963)	66	(.00858)	68	(.00459)
4	5	8	47	(.48252)	57	(.17722)	61	(.09919)	65	(.04905)	69	(.02102)	72	(.00998)	75	(.00425)
4	6	6	43	(.48114)	52	(.18307)	56	(.09810)	60	(.04546)	63	(.02287)	67	(.00769)	69	(.00408)
4	6	7	48	(.48267)	58	(.17938)	63	(.08619)	67	(.04174)	70	(.02208)	74	(.00818)	76	(.00463)
4	6	8	53	(.48397)	63	(.19820)	69	(.08972)	73	(.04561)	77	(.02141)	81	(.00859)	84	(.00390)
4	7	7	54	(.46809)	64	(.18800)	69	(.09759)	74	(.04318)	77	(.02426)	82	(.00783)	84	(.00465)
4	7	8	59	(.48519)	70	(.19552)	76	(.09450)	81	(.04441)	85	(.02170)	89	(.00946)	92	(.00466)
4	8	8	65	(.48624)	77	(.19320)	83	(.09869)	88	(.04966)	93	(.02191)	98	(.00831)	101	(.00428)
5	5	5	39	(.45888)	47	(.17478)	51	(.08666)	54	(.04558)	57	(.02136)	60	(.00873)	62	(.00440)
5	5	6	44	(.46248)	52	(.19706)	57	(.09078)	61	(.04151)	64	(.02066)	67	(.00921)	70	(.00360)
5	5	7	49	(.46569)	58	(.19200)	63	(.09430)	67	(.04665)	71	(.02008)	74	(.00960)	77	(.00413)
5	5	8	54	(.46806)	64	(.18774)	69	(.09734)	74	(.04300)	77	(.02413)	81	(.00992)	84	(.00461)
5	6	6	49	(.48280)	59	(.18118)	64	(.08787)	68	(.04301)	71	(.02299)	75	(.00868)	77	(.00498)
5	6	7	55	(.46829)	65	(.18952)	70	(.09906)	75	(.04427)	79	(.02042)	83	(.00824)	85	(.00494)
5	6	8	60	(.48527)	71	(.19681)	77	(.09575)	82	(.04535)	86	(.02235)	90	(.00985)	93	(.00490)
5	7	7	61	(.47066)	72	(.18741)	78	(.09019)	82	(.04981)	86	(.02499)	91	(.00904)	94	(.00447)
5	7	8	67	(.47271)	79	(.18559)	85	(.09438)	90	(.04739)	94	(.02489)	99	(.00077)	103	(.00410)

5	8	8	73	(.48727)	86	(.19344)	93	(.09319)	98	(.04917)	103	(.02322)	108	(.00968)	112	(.00434)
6	6	6	55	(.48418)	66	(.17959)	71	(.09285)	75	(.04897)	79	(.02306)	83	(.00954)	86	(.00447)
6	6	7	61	(.48536)	72	(.19831)	78	(.09721)	83	(.04645)	87	(.02311	92	(.00827)	95	(.00406)
6	6	8	67	(.48638)	79	(.19561)	86	(.08914)	91	(.04436)	95	(.02313)	100	(.00899)	103	(.00471)
6	7	7	68	(.47285)	80	(.18689)	86	(.09563)	91	(.04835)	96	(.02153)	101	(.00829)	104	(.00432)
6	7	8	74	(.48733)	87	(.19456)	94	(.09426)	100	(.04351)	104	(.02380)	110	(.00829)	113	(.00454)
6	8	8	81	(.48816)	95	(.19364)	102	(.09885)	108	(.04873)	113	(.02437)	119	(.00923)	123	(.00439)
7	7	7	75	(.47473)	88	(.18643)	95	(.08944)	100	(.04711)	105	(.02225)	110	(.00929)	114	(.00418)
7	7	8	82	(.47637)	96	(.18602)	103	(.09414)	109	(.04605)	114	(.02288)	120	(.00859)	123	(.00494)
7	8	8	89	(.48892)	104	(.19380)	112	(.09402)	118	(.04834)	124	(.02209)	130	(.00885)	134	(.00443)
8	8	8	97	(.48960)	113	(.19393)	121	(.09891)	128	(.04798)	34	(.02310)	140	(.00992)	145	(.00445)

k = 4

n_1	n_2	n_3	n_4	$\alpha = 0.5$		$\alpha = 0.2$		$\alpha = 0.1$		$\alpha = 0.05$		$\alpha = 0.025$		$\alpha = 0.01$		$\alpha = 0.005$	
2	2	2	2	13	(.45079)	16	(.19286)	18	(.08294)	19	(.04841)	21	(.01230)	22	(.00516)	23	(.00159)
3	3	3	3	28	(.47240)	34	(.18229)	37	(.09067)	40	(.03744)	42	(.01834)	44	(.00797)	45	(.00498)
4	4	4	4	49	(.48174)	58	(.19096)	63	(.08950)	67	(.04198)	70	(.02150)	73	(.00998)	76	(.00414)
5	5	5	5	76	(.48679)	89	(.18455)	95	(.09621)	100	(.04983)	105	(.02296)	110	(.00928)	114	(.00404)
6	6	6	6	109	(.48987)	126	(.18631)	134	(.09607)	141	(.04743)	147	(.02336)	154	(.00894)	158	(.00481)

(*Continued*)

Table R (*Continued*)

					$k=5$											
n_1	n_2	n_3	n_4	n_5	$\alpha = 0.5$		$\alpha = 0.2$		$\alpha = 0.1$		$\alpha = 0.05$		$\alpha = 0.025$		$\alpha = 0.01$		$\alpha = 0.005$	
2	2	2	2	2	21	(.46466)	26	(.16246)	28	(.08779)	30	(.04116)	32	(.01623)	33	(.00939)	35	(.00257)
3	3	3	3	3	46	(.48020)	54	(.19822)	59	(.08738)	62	(.04752)	65	(.02335)	69	(.00755)	71	(.00392)
4	4	4	4	4	81	(.48695)	94	(.18756)	100	(.09910)	106	(.04523)	110	(.02450)	116	(.00839)	119	(.00455)
5	5	5	5	5	126	(.49058)	144	(.19032)	153	(.09542)	160	(.04970)	167	(.02318)	174	(.00958)	179	(.00470)
6	6	6	6	6	181	(.49279)	204	(.19719)	216	(.09842)	226	(.04884)	235	(.02292)	244	(.00969)	251	(.00456)

						$k=6$												
n_1	n_2	n_3	n_4	n_5	n_6	$\alpha = 0.5$		$\alpha = 0.2$		$\alpha = 0.1$		$\alpha = 0.05$		$\alpha = 0.025$		$\alpha = 0.01$		$\alpha = 0.005$	
2	2	2	2	2	2	31	(.47293)	37	(.18713)	40	(.09533)	43	(.04083)	45	(.02071)	47	(.00944)	49	(.00379)
3	3	3	3	3	3	69	(.46981)	80	(.18058)	85	(.09686)	90	(.04524)	94	(.02201)	98	(.00958)	101	(.00473)
4	4	4	4	4	4	121	(.49006)	138	(.19092)	147	(.09181)	154	(.04567)	160	(.02274)	167	(.00888)	171	(.00486)
5	5	5	5	5	5	189	(.48567)	212	(.19377)	224	(.09679)	234	(.04775)	242	(.02477)	252	(.00964)	259	(.00456)
6	6	6	6	6	6	271	(.49452)	302	(.19304)	317	(.09982)	330	(.04490)	342	(.02361)	354	(.00999)	363	(.00485)

Because of the symmetry of the distribution of B under H_0 critical values and associated probabilities for all possible sample size combinations from 2 to 8 from 3 populations can be obtained from the table. For example, if $n_1 = 4$, $n_2 = 5$, and $n_3 = 2$, the required values are given by the table entry for $n_1 = 2$, $n_2 = 4$, and $n_3 = 5$.

Source: Adapted from Tables 1 and 2 of R. E. Odeh (1971), On Jonckheere's k-sample test against ordered alternatives, *Technometrices*, **13**, 912–918, with permission.

Table S Rank von Neumann Statistic

Each table entry for $n \leqslant 10$ is the exact left-tail or right-tail P value of the corresponding listed value of NM. Only those values of NM that are close to the typical values of $\alpha = 0.005$, 0.01, 0.025, 0.05 and 0.10 are included. The table entries for $n > 10$ are the left-tail critical values of RVN for the same typical α values. Since these entries are based on a beta approximation which is symmetric about 2, corresponding right-tail critical values are easily found. For example if $n = 40$, $\alpha = 0.005$, the left-tail critical value of RVN is 1.22 and hence the right-tail critical value is 2.78.

	P values for selected values of NM			
n	NM	*Left-tail P*	NM	*Right-tail P*
4	3	0.0833	17	0.0833
	6	0.2500	14	0.2500
5	4	0.0167	35	0.0333
	7	0.0500	33	0.0667
	10	0.1333	30	0.1333
6	5	0.0028	65	0.0028
	8	0.0083	63	0.0083
	11	0.0250	62	0.0139
	14	0.0472	60	0.0194
	16	0.0750	59	0.0306
	17	0.0806	56	0.0361
	19	0.1306	55	0.0694
			52	0.0972
			51	0.1139
7	14	0.0048	101	0.0040
	15	0.0079	100	0.0056
	17	0.0119	98	0.0087
	18	0.0151	97	0.0103
	20	0.0262	93	0.0206
	24	0.0444	92	0.0254
	25	0.0563	88	0.0464
	31	0.0988	87	0.0536
	32	0.1155	81	0.0988
			80	0.1115
8	23	0.0049	149	0.0043
	24	0.0073	148	0.0052
	26	0.0095	144	0.0084
	27	0.0111	143	0.0105
	32	0.0221	136	0.0249
	33	0.0264	135	0.0286
	39	0.0481	129	0.0481
	40	0.0529	128	0.0530
	48	0.0978	120	0.0997

(*Continued*)

Table S (*Continued*)

	P values for selected values of NM			
n	NM	*Left-tail P*	NM	*Right-tail P*
	49	0.1049	119	0.1074
9	34	0.0045	208	0.0046
	35	0.0055	207	0.0053
	40	0.0096	202	0.0091
	41	0.0109	201	0.0104
	49	0.0236	191	0.0245
	50	0.0255	190	0.0262
	59	0.0486	181	0.0499
	60	0.0516	180	0.0528
	71	0.0961	169	0.0978
	72	0.1010	168	0.1030
10	51	0.0050	282	0.0046
	59	0.0100	281	0.0051
	72	0.0242	273	0.0097
	73	0.0260	272	0.0103
	85	0.0493	259	0.0240
	86	0.0517	258	0.0252
	101	0.0985	246	0.0475
	102	0.1017	245	0.0504
			229	0.0990
			228	0.1023

	Left-tail critical values of RVN				
n	*0.005*	*0.010*	*0.025*	*0.050*	*0.100*
10	0.62	0.72	0.89	1.04	1.23
11	0.67	0.77	0.93	1.08	1.26
12	0.71	0.81	0.96	1.11	1.29
13	0.74	0.84	1.00	1.14	1.32
14	0.78	0.87	1.03	1.17	1.34
15	0.81	0.90	1.05	1.19	1.36
16	0.84	0.93	1.08	1.21	1.38
17	0.87	0.96	1.10	1.24	1.40
18	0.89	0.98	1.13	1.26	1.41
19	0.92	1.01	1.15	1.27	1.43
20	0.94	1.03	1.17	1.29	1.44

(*Continued*)

Table S (*Continued*)

	Left-tail critical values of RVN				
n	*0.005*	*0.010*	*0.025*	*0.050*	*0.100*
21	0.96	1.05	1.18	1.31	1.45
22	0.98	1.07	1.20	1.32	1.46
23	1.00	1.09	1.22	1.33	1.48
24	1.02	1.10	1.23	1.35	1.49
25	1.04	1.12	1.25	1.36	1.50
26	1.05	1.13	1.26	1.37	1.51
27	1.07	1.15	1.27	1.38	1.51
28	1.08	1.16	1.28	1.39	1.52
29	1.10	1.18	1.30	1.40	1.53
30	1.11	1.19	1.31	1.41	1.54
32	1.13	1.21	1.33	1.43	1.55
34	1.16	1.23	1.35	1.45	1.57
36	1.18	1.25	1.36	1.46	1.58
38	1.20	1.27	1.38	1.48	1.59
40	1.22	1.29	1.39	1.49	1.60
42	1.24	1.30	1.41	1.50	1.61
44	1.25	1.32	1.42	1.51	1.62
46	1.27	1.33	1.43	1.52	1.63
48	1.28	1.35	1.45	1.53	1.63
50	1.29	1.36	1.46	1.54	1.64
55	1.33	1.39	1.48	1.56	1.66
60	1.35	1.41	1.50	1.58	1.67
65	1.38	1.43	1.52	1.60	1.68
70	1.40	1.45	1.54	1.61	1.70
75	1.42	1.47	1.55	1.62	1.71
80	1.44	1.49	1.57	1.64	1.71
85	1.45	1.50	1.58	1.65	1.72
90	1.47	1.52	1.59	1.66	1.73
95	1.48	1.53	1.60	1.66	1.74
100	1.49	1.54	1.61	1.67	1.74
100[a]	1.48	1.53	1.61	1.67	1.74
100[b]	1.49	1.54	1.61	1.67	1.74

[a]Using the $N(2, 4/n)$ approximation.
[b]Using the $N[2, 20/(5n + 7)]$ approximation.
Source: Adapted from R. Bartels (1982), The rank version of von Neumann's ratio test for randomness, *Journal of the American Statistical Association*, **77**, 40–46, with permission.

Table T Lilliefors's Test for Exponential Distribution Critical Values

Table entries for any sample size N are the values of a Lilliefors's random variable with right-tail probability as given in the top row.

Sample Size N	*Significance Level*			
	0.100	*0.050*	*0.010*	*0.001*
4	.444	.483	.556	.626
5	.405	.443	.514	.585
6	.374	.410	.477	.551
7	.347	.381	.444	.509
8	.327	.359	.421	.502
9	.310	.339	.399	.460
10	.296	.325	.379	.444
11	.284	.312	.366	.433
12	.271	.299	.350	.412
14	.252	.277	.325	.388
16	.237	.261	.311	.366
18	.224	.247	.293	.328
20	.213	.234	.279	.329
25	.192	.211	.251	.296
30	.176	.193	.229	.270
40	.153	.168	.201	.241
50	.137	.150	.179	.214
60	.125	.138	.164	.193
75	.113	.124	.146	.173
100	.098	.108	.127	.150
Over 100	$.980/\sqrt{N}$	$1.077/\sqrt{N}$	$1.274/\sqrt{N}$	$1.501/\sqrt{N}$

Source: Adapted from R. L. Edgeman and R. C. Scott (1987), Lilliefors's tests for transformed variables, *Brazilian Journal of Probability and Statistics*, 1, 101–112, with permission.