$$\Phi(z) = P(Z \le z) = \int_{-\infty}^{z} \frac{1}{\sqrt{2\pi}} e^{-\frac{1}{2}u^2}\, du$$

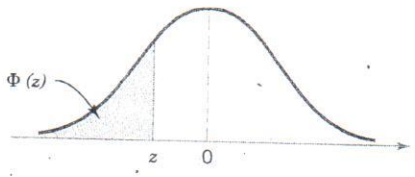

TABLE • III Cumulative Standard Normal Distribution

z	−0.09	−0.08	−0.07	−0.06	−0.05	−0.04	−0.03	−0.03	−0.01	−0.00
−3.9	0.000033	0.000034	0.000036	0.000037	0.000039	0.000041	0.000042	0.000044	0.000046	0.000048
−3.8	0.000050	0.000052	0.000054	0.000057	0.000059	0.000062	0.000064	0.000067	0.000069	0.000072
−3.7	0.000075	0.000078	0.000082	0.000085	0.000088	0.000092	0.000096	0.000100	0.000104	0.000108
−3.6	0.000112	0.000117	0.000121	0.000126	0.000131	0.000136	0.000142	0.000147	0.000153	0.000159
−3.5	0.000165	0.000172	0.000179	0.000185	0.000193	0.000200	0.000208	0.000216	0.000224	0.000233
−3.4	0.000242	0.000251	0.000260	0.000270	0.000280	0.000291	0.000302	0.000313	0.000325	0.000337
−3.3	0.000350	0.000362	0.000376	0.000390	0.000404	0.000419	0.000434	0.000450	0.000467	0.000483
−3.2	0.000501	0.000519	0.000538	0.000557	0.000577	0.000598	0.000619	0.000641	0.000664	0.000687
−3.1	0.000711	0.000736	0.000762	0.000789	0.000816	0.000845	0.000874	0.000904	0.000935	0.000968
−3.0	0.001001	0.001035	0.001070	0.001107	0.001144	0.001183	0.001223	0.001264	0.001306	0.001350
−2.9	0.001395	0.001441	0.001489	0.001538	0.001589	0.001641	0.001695	0.001750	0.001807	0.001866
−2.8	0.001926	0.001988	0.002052	0.002118	0.002186	0.002256	0.002327	0.002401	0.002477	0.002555
−2.7	0.002635	0.002718	0.002803	0.002890	0.002980	0.003072	0.003167	0.003264	0.003364	0.003467
−2.6	0.003573	0.003681	0.003793	0.003907	0.004025	0.004145	0.004269	0.004396	0.004527	0.004661
−2.5	0.004799	0.004940	0.005085	0.005234	0.005386	0.005543	0.005703	0.005868	0.006037	0.006210
−2.4	0.006387	0.006569	0.006756	0.006947	0.007143	0.007344	0.007549	0.007760	0.007976	0.008198
−2.3	0.008424	0.008656	0.008894	0.009137	0.009387	0.009642	0.009903	0.010170	0.010444	0.010724
−2.2	0.011011	0.011304	0.011604	0.011911	0.012224	0.012545	0.012874	0.013209	0.013553	0.013903
−2.1	0.014262	0.014629	0.015003	0.015386	0.015778	0.016177	0.016586	0.017003	0.017429	0.017864
−2.0	0.018309	0.018763	0.019226	0.019699	0.020182	0.020675	0.021178	0.021692	0.022216	0.022750
−1.9	0.023295	0.023852	0.024419	0.024998	0.025588	0.026190	0.026803	0.027429	0.028067	0.028717
−1.8	0.029379	0.030054	0.030742	0.031443	0.032157	0.032884	0.033625	0.034379	0.035148	0.035930
−1.7	0.036727	0.037538	0.038364	0.039204	0.040059	0.040929	0.041815	0.042716	0.043633	0.044565
−1.6	0.045514	0.046479	0.047460	0.048457	0.049471	0.050503	0.051551	0.052616	0.053699	0.054799
−1.5	0.055917	0.057053	0.058208	0.059380	0.060571	0.061780	0.063008	0.064256	0.065522	0.066807
−1.4	0.068112	0.069437	0.070781	0.072145	0.073529	0.074934	0.076359	0.077804	0.079270	0.080757
−1.3	0.082264	0.083793	0.085343	0.086915	0.088508	0.090123	0.091759	0.093418	0.095098	0.096801
−1.2	0.098525	0.100273	0.102042	0.103835	0.105650	0.107488	0.109349	0.111233	0.113140	0.115070
−1.1	0.117023	0.119000	0.121001	0.123024	0.125072	0.127143	0.129238	0.131357	0.133500	0.135666
−1.0	0.137857	0.140071	0.142310	0.144572	0.146859	0.149170	0.151505	0.153864	0.156248	0.158655
−0.9	0.161087	0.163543	0.166023	0.168528	0.171056	0.173609	0.176185	0.178786	0.181411	0.184060
−0.8	0.186733	0.189430	0.192150	0.194894	0.197662	0.200454	0.203269	0.206108	0.208970	0.211855
−0.7	0.214764	0.217695	0.220650	0.223627	0.226627	0.229650	0.232695	0.235762	0.238852	0.241964
−0.6	0.245097	0.248252	0.251429	0.254627	0.257846	0.261086	0.264347	0.267629	0.270931	0.274253
−0.5	0.277595	0.280957	0.284339	0.287740	0.291160	0.294599	0.298056	0.301532	0.305026	0.308538
−0.4	0.312067	0.315614	0.319178	0.322758	0.326355	0.329969	0.333598	0.337243	0.340903	0.344578
−0.3	0.348268	0.351973	0.355691	0.359424	0.363169	0.366928	0.370700	0.374484	0.378281	0.382089
−0.2	0.385908	0.389739	0.393580	0.397432	0.401294	0.405165	0.409046	0.412936	0.416834	0.420740
−0.1	0.424655	0.428576	0.432505	0.436441	0.440382	0.444330	0.448283	0.452242	0.456205	0.460172
0.0	0.464144	0.468119	0.472097	0.476078	0.480061	0.484047	0.488033	0.492022	0.496011	0.500000

$$\Phi(z) = P(Z \le z) = \int_{-\infty}^{z} \frac{1}{\sqrt{2\pi}} e^{-\frac{1}{2}u^2} du$$

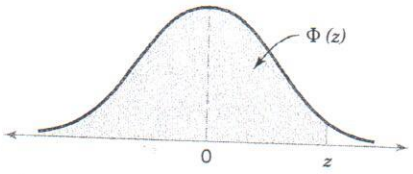

TABLE • III Cumulative Standard Normal Distribution (*Continued*)

z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.500000	0.503989	0.507978	0.511967	0.515953	0.519939	0.532922	0.527903	0.531881	0.535856
0.1	0.539828	0.543795	0.547758	0.551717	0.555760	0.559618	0.563559	0.567495	0.571424	0.575345
0.2	0.579260	0.583166	0.587064	0.590954	0.594835	0.598706	0.602568	0.606420	0.610261	0.614092
0.3	0.617911	0.621719	0.625516	0.629300	0.633072	0.636831	0.640576	0.644309	0.648027	0.651732
0.4	0.655422	0.659097	0.662757	0.666402	0.670031	0.673645	0.677242	0.680822	0.684386	0.687933
0.5	0.691462	0.694974	0.698468	0.701944	0.705401	0.708840	0.712260	0.715661	0.719043	0.722405
0.6	0.725747	0.729069	0.732371	0.735653	0.738914	0.742154	0.745373	0.748571	0.751748	0.754903
0.7	0.758036	0.761148	0.764238	0.767305	0.770350	0.773373	0.776373	0.779350	0.782305	0.785236
0.8	0.788145	0.791030	0.793892	0.796731	0.799546	0.802338	0.805106	0.807850	0.810570	0.813267
0.9	0.815940	0.818589	0.821214	0.823815	0.826391	0.828944	0.831472	0.833977	0.836457	0.838913
1.0	0.841345	0.843752	0.846136	0.848495	0.850830	0.853141	0.855428	0.857690	0.859929	0.862143
1.1	0.864334	0.866500	0.868643	0.870762	0.872857	0.874928	0.876976	0.878999	0.881000	0.882977
1.2	0.884930	0.886860	0.888767	0.890651	0.892512	0.894350	0.896165	0.897958	0.899727	0.901475
1.3	0.903199	0.904902	0.906582	0.908241	0.909877	0.911492	0.913085	0.914657	0.916207	0.917736
1.4	0.919243	0.920730	0.922196	0.923641	0.925066	0.926471	0.927855	0.929219	0.930563	0.931888
1.5	0.933193	0.934478	0.935744	0.936992	0.938220	0.939429	0.940620	0.941792	0.942947	0.944083
1.6	0.945201	0.946301	0.947384	0.948449	0.949497	0.950529	0.951543	0.952540	0.953521	0.954486
1.7	0.955435	0.956367	0.957284	0.958185	0.959071	0.959941	0.960796	0.961636	0.962462	0.963273
1.8	0.964070	0.964852	0.965621	0.966375	0.967116	0.967843	0.968557	0.969258	0.969946	0.970621
1.9	0.971283	0.971933	0.972571	0.973197	0.973810	0.974412	0.975002	0.975581	0.976148	0.976705
2.0	0.977250	0.977784	0.978308	0.978822	0.979325	0.979818	0.980301	0.980774	0.981237	0.981691
2.1	0.982136	0.982571	0.982997	0.983414	0.983823	0.984222	0.984614	0.984997	0.985371	0.985738
2.2	0.986097	0.986447	0.986791	0.987126	0.987455	0.987776	0.988089	0.988396	0.988696	0.988989
2.3	0.989276	0.989556	0.989830	0.990097	0.990358	0.990613	0.990863	0.991106	0.991344	0.991576
2.4	0.991802	0.992024	0.992240	0.992451	0.992656	0.992857	0.993053	0.993244	0.993431	0.993613
2.5	0.993790	0.993963	0.994132	0.994297	0.994457	0.994614	0.994766	0.994915	0.995060	0.995201
2.6	0.995339	0.995473	0.995604	0.995731	0.995855	0.995975	0.996093	0.996207	0.996319	0.996427
2.7	0.996533	0.996636	0.996736	0.996833	0.996928	0.997020	0.997110	0.997197	0.997282	0.997365
2.8	0.997445	0.997523	0.997599	0.997673	0.997744	0.997814	0.997882	0.997948	0.998012	0.998074
2.9	0.998134	0.998193	0.998250	0.998305	0.998359	0.998411	0.998462	0.998511	0.998559	0.998605
3.0	0.998650	0.998694	0.998736	0.998777	0.998817	0.998856	0.998893	0.998930	0.998965	0.998999
3.1	0.999032	0.999065	0.999096	0.999126	0.999155	0.999184	0.999211	0.999238	0.999264	0.999289
3.2	0.999313	0.999336	0.999359	0.999381	0.999402	0.999423	0.999443	0.999462	0.999481	0.999499
3.3	0.999517	0.999533	0.999550	0.999566	0.999581	0.999596	0.999610	0.999624	0.999638	0.999650
3.4	0.999663	0.999675	0.999687	0.999698	0.999709	0.999720	0.999730	0.999740	0.999749	0.999758
3.5	0.999767	0.999776	0.999784	0.999792	0.999800	0.999807	0.999815	0.999821	0.999828	0.999835
3.6	0.999841	0.999847	0.999853	0.999858	0.999864	0.999869	0.999874	0.999879	0.999883	0.999888
3.7	0.999892	0.999896	0.999900	0.999904	0.999908	0.999912	0.999915	0.999918	0.999922	0.999925
3.8	0.999928	0.999931	0.999933	0.999936	0.999938	0.999941	0.999943	0.999946	0.999948	0.999950
3.9	0.999952	0.999954	0.999956	0.999958	0.999959	0.999961	0.999963	0.999964	0.999966	0.999967

TABLE A.2 Cumulative Poisson Distribution

	λ = Mean										
X	.01	.05	.1	.2	.3	.4	.5	.6	.7	.8	.9
0	.990	.951	.905	.819	.741	.670	.607	.549	.497	.449	.407
1	1.000	.999	.995	.982	.963	.938	.910	.878	.844	.809	.772
2		1.000	1.000	.999	.996	.992	.986	.977	.966	.953	.937
3				1.000	1.000	.999	.998	.997	.994	.991	.987
4						1.000	1.000	1.000	.999	.999	.998
5									1.000	1.000	1.000

X	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0
0	.368	.333	.301	.273	.247	.223	.202	.183	.165	.150	.135
1	.736	.699	.663	.627	.592	.558	.525	.493	.463	.434	.406
2	.920	.900	.879	.857	.833	.809	.783	.757	.731	.704	.677
3	.981	.974	.966	.957	.946	.934	.921	.907	.891	.875	.857
4	.996	.995	.992	.989	.986	.981	.976	.970	.964	.956	.947
5	.999	.999	.998	.998	.997	.996	.994	.992	.990	.987	.983
6	1.000	1.000	1.000	1.000	.999	.999	.999	.998	.997	.997	.995
7					1.000	1.000	1.000	1.000	.999	.999	.999
8									1.000	1.000	1.000

X	2.2	2.4	2.6	2.8	3.0	3.5	4.0	4.5	5.0	5.5	6.0
0	.111	.091	.074	.061	.050	.030	.018	.011	.007	.004	.002
1	.355	.308	.267	.231	.199	.136	.092	.061	.040	.027	.017
2	.623	.570	.518	.469	.423	.321	.238	.174	.125	.088	.062
3	.819	.779	.736	.692	.647	.537	.433	.342	.265	.202	.151
4	.928	.904	.877	.848	.815	.725	.629	.532	.440	.358	.285
5	.975	.964	.951	.935	.916	.858	.785	.703	.616	.529	.446
6	.993	.988	.983	.976	.966	.935	.889	.831	.762	.686	.606
7	.998	.997	.995	.992	.988	.973	.949	.913	.867	.809	.744
8	1.000	.999	.999	.998	.996	.990	.979	.960	.932	.894	.847
9		1.000	1.000	.999	.999	.997	.992	.983	.968	.946	.916
10				1.000	1.000	.999	.997	.993	.986	.975	.957
11						1.000	999	.998	.995	.989	.980
12							1.000	.999	.998	.996	.991
13								1.000	.999	.998	.996
14									1.000	.999	.999
15										1.000	.999
16											1.000

TABLE A.2 Cumulative Poisson Distribution *continued*

	λ = Mean										
X	*6.5*	*7.0*	*7.5*	*8.0*	*9.0*	*10.0*	*12.0*	*14.0*	*16.0*	*18.0*	*20.0*
0	.002	.001	.001								
1	.011	.007	.005	.003	.001						
2	.043	.030	.020	.014	.006	.003	.001				
3	.112	.082	.059	.042	.021	.010	.002				
4	.224	.173	.132	.100	.055	.029	.008	.002			
5	.369	.301	.241	.191	.116	.067	.020	.006	.001		
6	.527	.450	.378	.313	.207	.130	.046	.014	.004	.001	
7	.673	.599	.525	.453	.324	.220	.090	.032	.010	.003	.001
8	.792	.729	.662	.593	.456	.333	.155	.062	.022	.007	.002
9	.877	.830	.776	.717	.587	.458	.242	.109	.043	.015	.005
10	.933	.901	.862	.816	.706	.583	.347	.176	.077	.030	.011
11	.966	.947	.921	.888	.803	.697	.462	.260	.127	.055	.021
12	.984	.973	.957	.936	.876	.792	.576	.358	.193	.092	.039
13	.993	.987	.978	.966	.926	.864	.682	.464	.275	.143	.066
14	.997	.994	.990	.983	.959	.917	.772	.570	.368	.208	.105
15	.999	.998	.995	.992	.978	.951	.844	.669	.467	.287	.157
16	1.000	.999	.998	.996	.989	.973	.899	.756	.566	.375	.221
17		1.000	.999	.998	.995	.986	.937	.827	.659	.469	.297
18			1.000	.999	.998	.993	.963	.883	.742	.562	.381
19				1.000	.999	.997	.979	.923	.812	.651	.470
20					1.000	.998	.988	.952	.868	.731	.559
21						.999	.994	.971	.911	.799	.644
22						1.000	.997	.983	.942	.855	.721
23							.999	.991	.963	.899	.787
24							.999	.995	.978	.932	.843
25							1.000	.997	.987	.955	.888
26								.999	.993	.972	.922
27								.999	.996	.983	.948
28								1.000	.998	.990	.966
29									.999	.994	.978
30									.999	.997	.987
31									1.000	.998	.992
32										.999	.995
33										1.000	.997
34											.999
35											.999
36											1.000

TABLE A.3 Cumulative Binomial Distribution

		p = Probability of Occurrence									
n	*X*	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50
2	0	.903	.810	.772	.640	.563	.490	.423	.360	.303	.250
	1	.998	.990	.978	.960	.938	.910	.878	.840	.798	.750
3	0	.857	.729	.614	.512	.422	.343	.275	.216	.166	.125
	1	.993	.972	.939	.896	.844	.784	.718	.648	.575	.500
	2	1.000	.999	.997	.992	.984	.973	.957	.936	.909	.875
4	0	.815	.656	.522	.410	.316	.240	.179	.130	.092	.063
	1	.986	.948	.890	.819	.738	.652	.563	.475	.391	.313
	2	1.000	.996	.988	.973	.949	.916	.874	.821	.759	.687
	3		1.000	.999	.998	.996	.992	.985	.974	.959	.938
5	0	.774	.590	.444	.328	.237	.168	.116	.078	.050	.031
	1	.977	.919	.835	.737	.633	.528	.428	.337	.256	.188
	2	.999	.991	.973	.942	.896	.837	.765	.683	.593	.500
	3	1.000	1.000	.998	.993	.984	.969	.946	.913	.869	.813
	4			1.000	1.000	.999	.998	.995	.990	.982	.969
6	0	.735	.531	.377	.262	.178	.118	.075	.047	.028	.016
	1	.967	.886	.776	.655	.534	.420	.319	.233	.164	.109
	2	.998	.984	.953	.901	.831	.744	.647	.544	.442	.344
	3	1.000	.999	.994	.983	.962	.930	.883	.821	.745	.656
	4		1.000	1.000	.998	.995	.989	.978	.959	.931	.891
	5				1.000	1.000	.999	.998	.996	.992	.984
7	0	.698	.478	.321	.210	.133	.082	.049	.028	.015	.008
	1	.956	.850	.717	.577	.445	.329	.234	.159	.102	.063
	2	.996	.974	.926	.852	.756	.647	.532	.420	.316	.227
	3	1.000	.997	.988	.967	.929	.874	.800	.710	.608	.500
	4		1.000	.999	.995	.987	.971	.944	.904	.847	.773
	5			1.000	1.000	.999	.996	.991	.981	.964	.938
	6					1.000	1.000	.999	.998	.996	.992
8	0	.663	.430	.272	.168	.100	.058	.032	.017	.008	.004
	1	.943	.813	.657	.503	.367	.255	.169	.106	.063	.035
	2	.994	.962	.895	.797	.679	.552	.428	.315	.220	.145
	3	1.000	.995	.979	.944	.886	.806	.706	.594	.477	.363
	4		1.000	.997	.990	.973	.942	.894	.826	.740	.637
	5			1.000	.999	.996	.989	.975	.950	.912	.855
	6				1.000	1.000	.999	.996	.991	.982	.965
	7						1.000	1.000	.999	.998	.996
9	0	.630	.387	.232	.134	.075	.040	.021	.010	.005	.002
	1	.929	.775	.599	.436	.300	.196	.121	.071	.039	.020
	2	.992	.947	.859	.738	.601	.463	.337	.232	.150	.090
	3	.999	.992	.966	.914	.834	.730	.609	.483	.361	.254
	4	1.000	.999	.994	.980	.951	.901	.828	.733	.621	.500
	5		1.000	.999	.997	.990	.975	.946	.901	.834	.746
	6			1.000	1.000	.999	.996	.989	.975	.950	.910
	7					1.000	1.000	.999	.996	.991	.980
	8							1.000	1.000	.999	.998
10	0	.599	.349	.197	.107	.056	.028	.013	.006	.003	.001
	1	.914	.736	.544	.376	.244	.149	.086	.046	.023	.011
	2	.988	.930	.820	.678	.526	.383	.262	.167	.100	.055
	3	.999	.987	.950	.879	.776	.650	.514	.382	.266	.172
	4	1.000	.998	.990	.967	.922	.850	.751	.633	.504	.377
	5		1.000	.999	.994	.980	.953	.905	.834	.738	.623
	6			1.000	.999	.996	.989	.974	.945	.898	.828
	7				1.000	1.000	.998	.995	.988	.973	.945
	8						1.000	.999	.998	.995	.989
	9							1.000	1.000	1.000	.999

TABLE A.3 Cumulative Binomial Distribution *continued*

		p = Probability of Occurrence									
n	*X*	*.05*	*.10*	*.15*	*.20*	*.25*	*.30*	*.35*	*.40*	*.45*	*.50*
11	0	.569	.314	.167	.086	.042	.020	.009	.004	.001	.000
	1	.898	.697	.492	.322	.197	.113	.061	.030	.014	.006
	2	.985	.910	.779	.617	.455	.313	.200	.119	.065	.033
	3	.998	.981	.931	.839	.713	.570	.426	.296	.191	.113
	4	1.000	.997	.984	.950	.885	.790	.668	.533	.397	.274
	5		1.000	.997	.988	.966	.922	.851	.753	.633	.500
	6			1.000	.998	.992	.978	.950	.901	.826	.726
	7				1.000	.999	.996	.988	.971	.939	.887
	8					1.000	.999	.998	.994	.985	.967
	9						1.000	1.000	.999	.998	.994
	10								1.000	1.000	1.000
12	0	.540	.282	.142	.069	.032	.014	.006	.002	.001	.000
	1	.882	.659	.443	.275	.158	.085	.042	.020	.008	.003
	2	.980	.889	.736	.558	.391	.253	.151	.083	.042	.019
	3	.998	.974	.908	.795	.649	.493	.347	.225	.134	.073
	4	1.000	.996	.976	.927	.842	.724	.583	.438	.304	.194
	5		.999	.995	.981	.946	.882	.787	.665	.527	.387
	6		1.000	.999	.996	.986	.961	.915	.842	.739	.613
	7			1.000	.999	.997	.991	.974	.943	.888	.806
	8				1.000	1.000	.998	.994	.985	.964	.927
	9						1.000	.999	.997	.992	.981
	10							1.000	1.000	.999	.997
	11									1.000	1.000
13	0	.513	.254	.121	.055	.024	.010	.004	.001	.000	.000
	1	.865	.621	.398	.234	.127	.064	.030	.013	.005	.002
	2	.975	.866	.692	.502	.333	.202	.113	.058	.027	.011
	3	.997	.966	.882	.747	.584	.421	.278	.169	.093	.046
	4	1.000	.994	.966	.901	.794	.654	.501	.353	.228	.133
	5		.999	.992	.970	.920	.835	.716	.574	.427	.291
	6		1.000	.999	.993	.976	.938	.871	.771	.644	.500
	7			1.000	.999	.994	.982	.954	.902	.821	.709
	8				1.000	.999	.996	.987	.968	.930	.867
	9					1.000	.999	.997	.992	.980	.954
	10						1.000	1.000	.999	.996	.989
	11								1.000	.999	.998
	12									1.000	1.000
14	0	.488	.229	.103	.044	.018	.007	.002	.001	.000	.000
	1	.847	.585	.357	.198	.101	.047	.021	.008	.003	.001
	2	.970	.842	.648	.448	.281	.161	.084	.040	.017	.006
	3	.996	.956	.853	.698	.521	.355	.220	.124	.063	.029
	4	1.000	.991	.953	.870	.742	.584	.423	.279	.167	.090
	5		.999	.988	.956	.888	.781	.641	.486	.337	.212
	6		1.000	.998	.988	.962	.907	.816	.692	.546	.395
	7			1.000	.998	.990	.969	.925	.850	.741	.605
	8				1.000	.998	.992	.976	.942	.881	.788
	9					1.000	.998	.994	.982	.957	.910
	10						1.000	.999	.996	.989	.971
	11							1.000	.999	.998	.994
	12								1.000	1.000	.999
	13										1.000

TABLE A.3 Cumulative Binomial Distribution *continued*

		p = Probability of Occurrence									
n	*X*	*.05*	*.10*	*.15*	*.20*	*.25*	*.30*	*.35*	*.40*	*.45*	*.50*
15	0	.463	.206	.087	.035	.013	.005	.002	.000	.000	.000
	1	.829	.549	.319	.167	.080	.035	.014	.005	.002	.000
	2	.964	.816	.604	.398	.236	.127	.062	.027	.011	.004
	3	.995	.944	.823	.648	.461	.297	.173	.091	.042	.018
	4	.999	.987	.938	.836	.686	.515	.352	.217	.120	.059
	5	1.000	.998	.983	.939	.852	.722	.564	.403	.261	.151
	6		1.000	.996	.982	.943	.869	.755	.610	.452	.304
	7			.999	.996	.983	.950	.887	.787	.654	.500
	8			1.000	.999	.996	.985	.958	.905	.818	.696
	9				1.000	.999	.996	.988	.966	.923	.849
	10					1.000	.999	.997	.991	.975	.941
	11						1.000	1.000	.998	.994	.982
	12								1.000	.999	.996
	13									1.000	1.000
16	0	.440	.185	.074	.028	.010	.003	.001	.000	.000	.000
	1	.811	.515	.284	.141	.063	.026	.010	.003	.001	.000
	2	.957	.789	.561	.352	.197	.099	.045	.018	.007	.002
	3	.993	.932	.790	.598	.405	.246	.134	.065	.028	.011
	4	.999	.983	.921	.798	.630	.450	.289	.167	.085	.038
	5	1.000	.997	.976	.918	.810	.660	.490	.329	.198	.105
	6		.999	.994	.973	.920	.825	.688	.527	.366	.227
	7		.1000	.999	.993	.973	.926	.841	.716	.563	.402
	8			1.000	.999	.993	.974	.933	.858	.744	.598
	9				1.000	.998	.993	.977	.942	.876	.773
	10					1.000	.998	.994	.981	.951	.895
	11						1.000	.999	.995	.985	.962
	12							1.000	.999	.997	.989
	13								1.000	.999	.998
	14									1.000	1.000
17	0	.418	.167	.063	.023	.008	.002	.001	.000	.000	.000
	1	.792	.482	.252	.118	.050	.019	.007	.002	.001	.000
	2	.950	.762	.520	.310	.164	.077	.033	.012	.004	.001
	3	.991	.917	.756	.549	.353	.202	.103	.046	.018	.006
	4	.999	.978	.901	.758	.574	.389	.235	.126	.060	.025
	5	1.000	.995	.968	.894	.765	.597	.420	.264	.147	.072
	6		.999	.992	.962	.893	.775	.619	.448	.290	.166
	7		1.000	.998	.989	.960	.895	.787	.641	.474	.315
	8			1.000	.997	.988	.960	.901	.801	.663	.500
	9				1.000	.997	.987	.962	.908	.817	.685
	10					.999	.997	.988	.965	.917	.834
	11					1.000	.999	.997	.989	.970	.928
	12						1.000	.999	.997	.991	.975
	13							1.000	1.000	.998	.994
	14									1.000	.999
	15										1.000

TABLE A.3 Cumulative Binomial Distribution *continued*

		p = Probability of Occurrence									
n	*X*	*.05*	*.10*	*.15*	*.20*	*.25*	*.30*	*.35*	*.40*	*.45*	*.50*
18	0	.397	.150	.054	.018	.006	.002	.000	.000	.000	.000
	1	.774	.450	.224	.099	.039	.014	.005	.001	.000	.000
	2	.942	.734	.480	.271	.135	.060	.024	.008	.003	.001
	3	.989	.902	.720	.501	.306	.165	.078	.033	.012	.004
	4	.998	.972	.879	.716	.519	.333	.189	.094	.041	.015
	5	1.000	.994	.958	.867	.717	.534	.355	.209	.108	.048
	6		.999	.988	.949	.861	.722	.549	.374	.226	.119
	7		1.000	.997	.984	.943	.859	.728	.563	.391	.240
	8			.999	.996	.981	.940	.861	.737	.578	.407
	9			1.000	.999	.995	.979	.940	.865	.747	.593
	10				1.000	.999	.994	.979	.942	.872	.760
	11					1.000	.999	.994	.980	.946	.881
	12						1.000	.999	.994	.982	.952
	13							1.000	.999	.995	.985
	14								1.000	.999	.996
	15									1.000	.999
	16										1.000
19	0	.377	.135	.046	.014	.004	.001	.000	.000	.000	.000
	1	.755	.420	.198	.083	.031	.010	.003	.001	.000	.000
	2	.933	.705	.441	.237	.111	.046	.017	.005	.002	.000
	3	.987	.885	.684	.455	.263	.133	.059	.023	.008	.002
	4	.998	.965	.856	.673	.465	.282	.150	.070	.028	.010
	5	1.000	.991	.946	.837	.668	.474	.297	.163	.078	.032
	6		.998	.984	.932	.825	.666	.481	.308	.173	.084
	7		1.000	.996	.977	.923	.818	.666	.488	.317	.180
	8			.999	.993	.971	.916	.815	.667	.494	.324
	9			1.000	.998	.991	.967	.913	.814	.671	.500
	10				1.000	.998	.989	.965	.912	.816	.676
	11					1.000	.997	.989	.965	.913	.820
	12						.999	.997	.988	.966	.916
	13						1.000	.999	.997	.989	.968
	14							1.000	.999	.997	.990
	15								1.000	.999	.998
	16									1.000	1.000
20	0	.358	.122	.039	.012	.003	.001	.000	.000	.000	.000
	1	.736	.392	.176	.069	.024	.008	.002	.001	.000	.000
	2	.925	.677	.405	.206	.091	.035	.012	.004	.001	.000
	3	.984	.867	.648	.411	.225	.107	.044	.016	.005	.001
	4	.997	.957	.830	.630	.415	.238	.118	.051	.019	.006
	5	1.000	.989	.933	.804	.617	.416	.245	.126	.055	.021
	6		.998	.978	.913	.786	.608	.417	.250	.130	.058
	7		1.000	.994	.968	.898	.772	.601	.416	.252	.132
	8			.999	.990	.959	.887	.762	.596	.414	.252
	9			1.000	.997	.986	.952	.878	.755	.591	.412
	10				.999	.996	.983	.947	.872	.751	.588
	11				1.000	.999	.995	.980	.943	.869	.748
	12					1.000	.999	.994	.979	.942	.868
	13						1.000	.998	.994	.979	.942
	14							1.000	.998	.994	.979
	15								1.000	.998	.994
	16									1.000	.999
	17										1.000

TABLE A.4 χ^2 Values for Given Tail Areas

Degress of Freedom	α = *Right-Hand Tail Area*											
υ	*.999*	*.995*	*.99*	*.975*	*.95*	*.90*	*.10*	*.05*	*.025*	*.01*	*.005*	*.001*
1	.00	.00	.00	.00	.00	.02	2.71	3.84	5.02	6.63	7.88	10.83
2	.00	.01	.02	.05	.10	.21	4.61	5.99	7.38	9.21	10.60	13.81
3	.02	.07	.11	.22	.35	.58	6.25	7.81	9.35	11.34	12.84	16.25
4	.09	.21	.30	.48	.71	1.06	7.78	9.49	11.14	13.28	14.86	18.45
5	.21	.41	.55	.83	1.15	1.61	9.24	11.07	12.83	15.09	16.75	20.50
6	.38	.68	.87	1.24	1.64	2.20	10.64	12.59	14.45	16.81	18.54	22.44
7	.60	.99	1.24	1.69	2.17	2.83	12.02	14.07	16.01	18.48	20.28	24.30
8	.86	1.34	1.65	2.18	2.73	3.49	13.36	15.51	17.53	20.09	21.95	26.11
9	1.15	1.74	2.09	2.70	3.33	4.17	14.68	16.92	19.02	21.67	23.59	27.86
10	1.48	2.16	2.56	3.25	3.94	4.87	15.99	18.31	20.48	23.21	25.19	29.57
11	1.83	2.60	3.05	3.82	4.57	5.58	17.27	19.68	21.92	24.72	26.76	31.25
12	2.22	3.07	3.57	4.40	5.23	6.30	18.55	21.03	23.34	26.22	28.30	32.90
13	2.62	3.57	4.11	5.01	5.89	7.04	19.81	22.36	24.74	27.69	29.82	34.52
14	3.05	4.07	4.66	5.63	6.57	7.79	21.06	23.68	26.12	29.14	31.32	36.12
15	3.48	4.60	5.23	6.26	7.26	8.55	22.31	25.00	27.49	30.58	32.80	37.69
16	3.94	5.14	5.81	6.91	7.96	9.31	23.54	26.30	28.85	32.00	34.27	39.25
17	4.42	5.70	6.41	7.56	8.67	10.09	24.77	27.59	30.19	33.41	35.72	40.79
18	4.91	6.26	7.01	8.23	9.39	10.86	25.99	28.87	31.53	34.81	37.16	42.31
19	5.41	6.84	7.63	8.91	10.12	11.65	27.20	30.14	32.85	36.19	38.58	43.82
20	5.92	7.43	8.26	9.59	10.85	12.44	28.41	31.41	34.17	37.57	39.99	45.31
21	6.45	8.04	8.90	10.28	11.59	13.24	29.62	32.67	35.48	38.93	41.40	46.80
22	6.98	8.64	9.54	10.98	12.34	14.04	30.81	33.92	36.78	40.29	42.79	48.24
23	7.53	9.26	10.20	11.69	13.09	14.85	32.01	35.17	38.08	41.64	44.18	49.71
24	8.08	9.89	10.86	12.40	13.85	15.66	33.20	36.42	39.36	42.98	45.56	51.16
25	8.65	10.52	11.52	13.12	14.61	16.47	34.38	37.65	40.65	44.31	46.93	52.61
26	9.2	11.2	12.2	13.8	15.4	17.3	35.6	38.9	41.9	45.6	48.3	54.0
27	9.8	11.8	12.9	14.6	16.2	18.1	36.7	40.1	43.2	47.0	49.6	55.5
28	10.4	12.5	13.6	15.3	16.9	18.9	37.9	41.3	44.5	48.3	51.0	56.9
29	11.0	13.1	14.3	16.0	17.7	19.8	39.1	42.6	45.7	49.6	52.3	58.3
30	11.6	13.8	15.0	16.8	18.5	20.6	40.3	43.8	47.0	50.9	53.7	59.7
32	12.7	15.1	16.3	18.3	20.1	22.3	42.6	46.2	49.5	53.5	56.4	62.6
34	13.9	16.5	17.8	19.8	21.7	23.9	44.9	48.6	52.0	56.1	59.0	65.3
36	15.2	17.9	19.2	21.3	23.3	25.6	47.2	51.0	54.5	58.6	61.6	68.1
38	16.5	19.3	20.7	22.9	24.9	27.3	49.5	53.4	56.9	61.2	64.2	70.8
40	17.8	20.7	22.1	24.4	26.5	29.1	51.8	55.8	59.3	63.7	66.8	73.5
42	19.2	22.1	23.6	26.0	28.1	30.8	54.1	58.1	61.8	66.2	69.4	76.2
44	20.5	23.5	25.1	27.6	29.8	32.5	56.4	60.5	64.2	68.7	71.9	78.8
46	21.9	25.0	26.6	29.2	31.4	34.2	58.6	62.8	66.6	71.2	74.5	81.5
48	23.2	26.5	28.2	30.7	33.1	36.0	60.9	65.2	69.0	73.7	77.0	84.1
50	24.6	28.0	29.7	32.3	34.8	37.7	63.2	67.5	71.4	76.2	79.5	86.7
55	28.1	31.7	33.5	36.4	39.0	42.1	68.8	73.3	77.4	82.3	85.8	93.2
60	31.7	35.5	37.5	40.5	43.2	46.5	74.4	79.1	83.3	88.4	92.0	99.7
65	35.3	39.4	41.4	44.6	47.4	50.9	80.0	84.8	89.2	94.4	98.1	106.1
70	39.0	43.2	45.4	48.8	51.7	55.3	85.5	90.5	95.0	100.4	104.2	112.4
75	42.7	47.2	49.5	52.9	56.1	59.8	91.1	96.2	100.8	106.4	110.3	118.7
80	46.5	51.1	53.5	57.1	60.4	64.3	96.6	106.9	101.6	112.3	116.3	124.9
85	50.3	55.1	57.6	61.4	64.7	68.8	102.1	107.5	112.4	118.3	122.4	131.1
90	54.1	59.2	61.7	65.6	69.1	73.3	107.6	113.1	118.1	124.1	128.3	137.3
95	58.0	63.2	65.9	69.9	73.5	77.8	113.0	118.7	123.9	130.0	134.3	143.4
100	61.9	67.3	70.0	74.2	77.9	82.4	118.5	124.3	129.6	135.8	140.2	149.5

TABLE A.5 t Values for Given Tail Areas

Degrees of Freedom	α = *Right-Hand Tail Area*						
υ	*.250*	*.100*	*.050*	*.025*	*.010*	*.005*	*.001*
1	1.000	3.078	6.314	12.706	31.821	63.567	318.309
2	.816	1.886	2.920	4.303	6.965	9.925	22.327
3	.765	1.638	2.353	3.182	4.541	5.841	10.215
4	.741	1.533	2.132	2.776	3.747	4.604	7.173
5	.727	1.476	2.015	2.571	3.365	4.032	5.893
6	.718	1.440	1.943	2.447	3.143	3.707	5.208
7	.711	1.415	1.895	2.365	2.998	3.499	4.785
8	.706	1.397	1.860	2.306	2.896	3.355	4.501
9	.703	1.383	1.833	2.262	2.821	3.250	4.297
10	.700	1.372	1.812	2.228	2.764	3.169	4.144
11	.697	1.363	1.796	2.201	2.718	3.106	4.025
12	.695	1.356	1.782	2.179	2.681	3.055	3.930
13	.694	1.350	1.771	2.160	2.650	3.012	3.852
14	.692	1.345	1.761	2.145	2.624	2.977	3.787
15	.691	1.341	1.753	2.131	2.602	2.947	3.733
16	.690	1.337	1.746	2.120	2.583	2.921	3.686
17	.689	1.333	1.740	2.110	2.567	2.898	3.646
18	.688	1.330	1.734	2.101	2.552	2.878	3.610
19	.688	1.328	1.729	2.093	2.539	2.861	3.579
20	.687	1.325	1.725	2.086	2.528	2.845	3.552
21	.686	1.323	1.721	2.080	2.518	2.831	3.527
22	.686	1.321	1.717	2.074	2.508	2.819	3.505
23	.685	1.319	1.714	2.069	2.500	2.807	3.485
24	.685	1.318	1.711	2.064	2.492	2.797	3.467
25	.684	1.316	1.708	2.060	2.485	2.787	3.450
26	.684	1.315	1.706	2.056	2.479	2.779	3.435
27	.684	1.314	1.703	2.052	2.473	2.771	3.421
28	.683	1.313	1.701	2.048	2.467	2.763	3.408
29	.683	1.311	1.699	2.045	2.462	2.756	3.396
30	.683	1.310	1.697	2.042	2.457	2.750	3.385
35	.682	1.306	1.690	2.030	2.438	2.724	3.340
40	.681	1.303	1.684	2.021	2.423	2.704	3.307
50	.679	1.299	1.676	2.009	2.403	2.678	3.261
60	.679	1.296	1.671	2.000	2.390	2.660	3.232
70	.678	1.294	1.667	1.994	2.381	2.648	3.211
80	.678	1.292	1.664	1.990	2.374	2.639	3.195
90	.677	1.291	1.662	1.987	2.368	2.632	3.183
100	.677	1.290	1.660	1.984	2.364	2.626	3.174
120	.677	1.289	1.658	1.980	2.358	2.617	3.160
∞	.674	1.282	1.645	1.960	2.326	2.576	3.090

TABLE A.6 *F* Values for Given Tail Areas

υ_2	α	υ_1 = Degrees of Freedom for Numerator								
		1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
1	.100	39.9	49.5	53.6	55.8	57.2	58.2	58.9	59.4	59.9
	.050	161.4	199.5	215.7	224.6	230.2	234.0	236.8	238.4	240.5
	.025	647.8	799.5	864.2	899.6	921.8	937.1	948.2	956.7	963.3
	.010	4052.2	4999.5	5403.4	5624.6	5763.6	5859.0	5928.4	5981.1	6022.5
	.001	40600.	50000.	54000.	56200.	57600.	58600.	59300.	59800.	60200.
2	.100	8.53	9.00	9.16	9.24	9.29	9.33	9.35	9.37	9.38
	.050	18.51	19.00	19.16	19.25	19.30	19.33	19.35	19.37	19.38
	.025	38.51	39.00	39.17	39.25	39.25	39.33	39.36	39.37	39.39
	.010	98.50	99.00	99.17	99.25	99.30	99.33	99.36	99.37	99.39
	.001	998.50	999.00	999.17	999.30	999.30	999.36	999.36	999.37	999.39
3	.100	5.54	5.46	5.39	5.34	5.31	5.28	5.27	5.25	5.24
	.050	10.13	9.55	9.28	9.12	9.01	8.94	8.89	8.85	8.81
	.025	17.44	16.04	15.44	15.10	14.88	14.73	14.62	14.54	14.47
	.010	34.12	30.82	29.46	28.71	28.24	27.91	27.67	27.49	27.35
	.001	167.03	148.50	141.11	137.10	134.58	132.85	131.58	130.62	129.86
4	.100	4.54	4.32	4.19	4.11	4.05	4.01	3.98	3.95	3.94
	.050	7.71	6.94	6.59	6.39	6.26	6.16	6.09	6.04	6.00
	.025	12.22	10.65	9.98	9.60	9.36	9.20	9.07	8.98	8.90
	.010	21.20	18.00	16.69	15.98	15.52	15.21	14.98	14.80	14.66
	.001	74.14	61.25	56.18	53.44	51.71	50.53	49.66	49.00	48.47
5	.100	4.06	3.78	3.62	3.52	3.45	3.40	3.37	3.34	3.32
	.050	6.61	5.79	5.41	5.19	5.05	4.95	4.88	4.82	4.77
	.025	10.01	8.43	7.76	7.39	7.15	6.98	6.85	6.76	6.68
	.010	16.26	13.27	12.06	11.39	10.97	10.67	10.46	10.29	10.16
	.001	47.18	37.12	33.20	31.09	29.75	28.83	28.16	27.65	27.24
6	.100	3.78	3.46	3.29	3.18	3.11	3.05	3.01	2.98	2.96
	.050	5.99	5.14	4.76	4.53	4.39	4.28	4.21	4.15	4.10
	.025	8.81	7.26	6.60	6.23	5.99	5.82	5.70	5.60	5.52
	.010	13.75	10.92	9.78	9.15	8.75	8.47	8.26	8.10	7.98
	.001	35.51	27.00	23.70	21.92	20.80	20.03	19.46	19.03	18.69
7	.100	3.59	3.26	3.07	2.96	2.88	2.83	2.78	2.75	2.72
	.050	5.59	4.74	4.35	4.12	3.97	3.87	3.79	3.73	3.68
	.025	8.07	6.54	5.89	5.52	5.29	5.12	4.99	4.90	4.82
	.010	12.25	9.55	8.45	7.85	7.46	7.19	6.99	6.84	6.72
	.001	29.25	21.69	18.77	17.20	16.21	15.52	15.02	14.63	14.33
8	.100	3.46	3.11	2.92	2.81	2.73	2.67	2.62	2.59	2.56
	.050	5.32	4.46	4.07	3.84	3.69	3.58	3.50	3.44	3.39
	.025	7.57	6.06	5.42	5.05	4.82	4.65	4.53	4.43	4.36
	.010	11.26	8.65	7.59	7.01	6.63	6.37	6.18	6.03	5.91
	.001	25.41	18.49	15.83	14.39	13.48	12.86	12.40	12.05	11.77
9	.100	3.36	3.01	2.81	2.69	2.61	2.55	2.51	2.47	2.44
	.050	5.12	4.26	3.86	3.63	3.48	3.37	3.29	3.23	3.18
	.025	7.21	5.71	5.08	4.72	4.48	4.32	4.20	4.10	4.03
	.010	10.56	8.02	6.99	6.42	6.06	5.80	5.61	5.47	5.35
	.001	22.86	16.39	13.90	12.56	11.71	11.13	10.70	10.37	10.11
10	.100	3.29	2.92	2.73	2.61	2.52	2.46	2.41	2.38	2.35
	.050	4.96	4.10	3.71	3.48	3.33	3.22	3.14	3.07	3.02
	.025	6.94	5.46	4.83	4.47	4.24	4.07	3.95	3.85	3.78
	.010	10.04	7.56	6.55	5.99	5.64	5.39	5.20	5.06	4.94
	.001	21.04	14.91	12.55	11.28	10.48	9.93	9.52	9.20	8.96
11	.100	3.23	2.86	2.66	2.54	2.45	2.39	2.34	2.30	2.27
	.050	4.84	3.98	3.59	3.36	3.20	3.09	3.01	2.95	2.90
	.025	6.72	5.26	4.63	4.28	4.04	3.88	3.76	3.66	3.59
	.010	9.65	7.21	6.22	5.67	5.32	5.07	4.89	4.74	4.63
	.001	19.69	13.81	11.56	10.35	9.58	9.05	8.66	8.35	8.12

α = right-hand tail area.

υ_2 = degrees of freedom for denominator.

TABLE A.6 F Values for Given Tail Areas *continued*

		υ_1 = Degrees of Freedom for Numerator								
υ_2	α	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
12	.100	3.18	2.81	2.61	2.48	2.39	2.33	2.28	2.24	2.21
	.050	4.75	3.89	3.49	3.26	3.11	3.00	2.91	2.85	2.80
	.025	6.55	5.10	4.47	4.12	3.89	3.73	3.61	3.51	3.44
	.010	9.33	6.93	5.95	5.41	5.06	4.82	4.64	4.50	4.39
	.001	18.64	12.97	10.80	9.63	8.89	8.38	8.00	7.71	7.48
15	.100	3.07	2.70	2.49	2.36	2.27	2.21	2.16	2.12	2.09
	.050	4.54	3.68	3.29	3.06	2.90	2.79	2.71	2.64	2.59
	.025	6.20	4.77	4.15	3.80	3.58	3.41	3.29	3.20	3.12
	.010	8.68	6.36	5.42	4.89	4.56	4.32	4.14	4.00	3.89
	.001	16.59	11.34	9.34	8.25	7.57	7.09	6.74	6.47	6.26
18	.100	3.01	2.62	2.42	2.29	2.20	2.13	2.08	2.04	2.00
	.050	4.41	3.55	3.16	2.93	2.77	2.66	2.58	2.51	2,46
	.025	5.98	4.56	3.95	3.61	3.38	3.22	3.10	3.01	2.93
	.010	8.29	6.01	5.09	4.58	4.25	4.01	3.84	3.71	3.60
	.001	15.38	10.39	8.49	7.46	6.81	6.35	6.02	5.76	5.56
20	.100	2.97	2.59	2.38	2.25	2.16	2.09	2.04	2.00	1.96
	.050	4.35	3.49	3.10	2.87	2.71	2.60	2.51	2.45	2.39
	.025	5.87	4.46	3.86	3.51	3.29	3.13	3.01	2.91	2.84
	.010	8.10	5.85	4.94	4.43	4.10	3.87	3.70	3.56	3.46
	.001	14.82	9.95	8.10	7.10	6.46	6.02	5.69	5.44	5.24
25	.100	2.92	2.53	2.32	2.18	2.09	2.02	1.97	1.93	1.89
	.050	4.24	3.39	2.99	2.76	2.60	2.49	2.40	2.34	2.28
	.025	5.69	4.29	3.69	3.35	3.13	2.97	2.85	2.75	2.68
	.010	7.77	5.57	4.68	4.18	3.85	3.63	3.46	3.32	3.22
	.001	13.88	9.22	7.45	6.49	5.89	5.46	5.15	4.91	4.71
30	.100	2.88	2.49	2.28	2.14	2.05	1.98.	1.93	1.88	1.85
	.050	4.17	3.32	2.92	2.69	2.53	2.42	2.33	2.27	2.21
	.025	5.57	4.18	3.59	3.25	3.03	2.87	2.75	2.65	2.57
	.010	7.56	5.39	4.51	4.02	3.70	3.47	3.30	3.17	3.07
	.001	13.29	8.77	7.05	6.12	5.53	5.12	4.82	4.58	4.39
40	.100	2.84	2.44	2.23	2.09	2.00	1.93	1.87	1.83	1.79
	.050	4.08	3.23	2.84	2.61	2.45	2.34	2.25	2.18	2.12
	.025	5.42	4.05	3.46	3.13	2.90	2.74	2.62	2.53	2.45
	.010	7.31	5.18	4.31	3.83	3.51	3.29	3.12	2.99	2.89
	.001	12.61	8.25	6.59	5.70	5.13	4.73	4.44	4.21	4.02
50	.100	2.81	2.41	2.20	2.06	1.97	1.90	1.84	1.80	1.76
	.050	4.03	3.18	2.79	2.56	2.40	2.29	2.20	2.13	2.07
	.025	5.34	3.97	3.39	3.05	2.83	2.67	2.55	2.46	2.38
	.010	7.17	5.06	4.20	3.72	3.41	3.19	3.02	2.89	2.78
	.001	12.22	7.96	6.34	5.46	4.90	4.51	4.22	4.00	3.82
60	.100	2.79	2.39	2.18	2.04	1.95	1.87	1.82	1.77	1.74
	.050	4.00	3.15	2.76	2.53	2.37	2.25	2.17	2.10	2.04
	.025	5.29	3.93	3.34	3.01	2.79	2.63	2.51	2.41	2.33
	.010	7.08	4.98	4.13	3.65	3.34	3.12	2.95	2.82	2.72
	.001	11.97	7.77	6.17	5.31	4.76	4.37	4.09	3.86	3.69
80	.100	2.77	2.37	2.15	2.02	1.92	1.85	1.79	1.75	1.71
	.050	3.96	3.11	2.72	2.49	2.33	2.21	2.13	2.06	2.00
	.025	5.22	3.86	3.28	2.95	2.73	2.57	2.45	2.35	2.28
	.010	6.96	4.88	4.04	3.56	3.26	3.04	2.87	2.74	2.64
	.001	11.67	7.54	5.97	5.12	4.58	4.20	3.92	3.70	3.53
90	.100	2.76	2.36	2.15	2.01	1.91	1.84	1.78	1.74	1.70
	.050	3.95	3.10	2.71	2.47	2.32	2.20	2.11	2.04	1.99
	.025	5.20	3.84	3.26	2.93	2.71	2.55	2.43	2.34	2.26
	.010	6.93	4.85	4.01	3.53	3.23	3.01	2.84	2.72	2.61
	.001	11.57	7.47	5.91	5.06	4.53	4.15	3.87	3.65	3.48

TABLE A.6 F Values for Given Tail Areas *continued*

ν_2	α	ν_1 = Degrees of Freedom for Numerator								
		1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
100	.100	2.76	2.36	2.14	2.00	1.91	1.83	1.78	1.73	1.69
	.050	3.94	3.09	2.70	2.46	2.31	2.19	2.10	2.03	1.97
	.025	5.18	3.83	3.25	2.92	2.70	2.54	2.42	2.32	2.24
	.010	6.90	4.82	3.98	3.51	3.21	2.99	2.82	2.69	2.59
	.001	11.50	7.41	5.86	5.02	4.48	4.11	3.83	3.61	3.44
∞	.100	2.71	2.30	2.08	1.95	1.85	1.77	1.72	1.67	1.63
	.050	3.84	3.00	2.61	2.37	2.21	2.10	2.01	1.94	1.88
	.025	5.02	3.69	3.12	2.79	2.57	2.41	2.29	2.19	2.11
	.010	6.64	4.61	3.77	3.32	3.02	2.80	2.64	2.51	2.41
	.001	10.81	6.85	5.43	4.61	4.15	3.78	3.50	3.29	3.12

ν_2	α	ν_1 = Degrees of Freedom for Numerator								
		10	*15*	*20*	*25*	*30*	*50*	*75*	*100*	∞
1	.100	60.2	61.2	61.7	62.1	62.3	62.7	62.9	63.0	63.3
	.050	241.9	245.9	248.0	249.3	250.1	251.8	258.8	253.0	280.7
	.025	968.6	984.9	993.1	998.1	1001.4	1008.1	1011.5	1013.2	1018.0
	.010	6055.8	6157.3	6208.7	6329.8	6260.6	6302.5	6323.6	6334.1	6366.0
	.001	60600.	61600.	62100.	62400.	62500.	63000.	63200.	63300.	63700.
2	.100	9.39	9.42	9.44	9.45	9.46	9.47	9.48	9.48	9.49
	.050	19.40	19.43	19.45	19.46	19.46	19.48	19.48	19.49	19.51
	.025	39.40	39.43	39.45	39.46	39.46	39.48	39.48	39.49	39.50
	.010	99.40	99.43	99.45	99.46	99.47	99.48	99.49	99.49	99.64
	.001	999.40	999.43	999.45	999.46	999.47	999.48	999.49	999.49	999.49
3	.100	5.23	5.20	5.18	5.17	5.17	5.15	5.15	5.14	5.13
	.050	8.79	8.70	8.66	8.63	8.62	8.58	8.56	8.55	8.53
	.025	14.42	14.25	14.17	14.12	14.08	14.01	13.97	13.96	13.90
	.010	27.23	26.87	26.69	26.58	26.50	26.35	26.28	26.24	26.14
	.001	129.25	127.37	126.42	125.84	125.45	124.66	124.27	124.07	124.00
4	.100	3.92	3.87	3.84	3.83	3.82	3.80	3.78	3.78	3.76
	.050	5.96	5.86	5.80	5.77	5.75	5.70	5.68	5.66	5.63
	.025	8.84	8.66	8.56	8.50	8.46	8.38	8.34	8.32	8.27
	.010	14.55	14.20	14.02	13.91	13.84	13.69	13.61	13.58	13.47
	.001	48.05	46.76	46.10	45.70	45.43	44.88	44.61	44.47	44.46
5	.100	3.30	3.24	3.21	3.19	3.17	3.15	3.13	3.13	3.11
	.050	4.74	4.62	4.56	4.52	4.50	4.44	4.42	4.41	4.37
	.025	6.62	6.43	6.33	6.27	6.23	6.14	6.10	6.08	6.02
	.010	10.05	9.72	9.55	9.45	9.38	9.24	9.17	9.13	9.04
	.001	26.92	25.91	25.39	25.08	24.87	24.44	24.22	24.12	23.98
6	.100	2.94	2.87	2.84	2.81	2.80	2.77	2.75	2.75	2.72
	.050	4.06	3.94	3.87	3.83	3.81	3.75	3.73	3.71	3.67
	.025	5.46	5.27	5.17	5.11	5.07	4.98	4.94	4.92	4.85
	.010	7.87	7.56	7.40	7.30	7.23	7.09	7.02	6.99	6.88
	.001	18.41	17.56	17.12	16.85	16.67	16.31	16.12	16.03	15.92
7	.100	2.70	2.63	2.59	2.57	2.56	2.52	2.51	2.50	2.47
	.050	3.64	3.51	3.44	3.40	3.38	3.32	3.29	3.27	3.23
	.025	4.76	4.57	4.47	4.40	4.36	4.28	4.23	4.21	4.15
	.010	6.62	6.31	6.16	6.06	5.99	5.86	5.79	5.75	5.66
	.001	14.08	13.32	12.93	12.69	12.53	12.20	12.04	11.95	11.72
8	.100	2.54	2.46	2.42	2.40	2.38	2.35	2.33	2.32	2.29
	.050	3.35	3.22	3.15	3.11	3.08	3.02	2.99	2.97	2.93
	.025	4.30	4.10	4.00	3.94	3.89	3.81	3.76	3.74	3.67
	.010	5.81	5.52	5.36	5.26	5.20	5.07	5.00	4.96	4.87
	.001	11.54	10.84	10.48	10.26	10.11	9.80	9.65	9.57	9.41

TABLE A.6 F Values for Given Tail Areas

		υ_1 = Degrees of Freedom for Numerator								
υ_2	α	*10*	*15*	*20*	*25*	*30*	*50*	*75*	*100*	∞
	.100	2.42	2.34	2.30	2.27	2.25	2.22	2.20	2.19	2.16
	.050	3.14	3.01	2.94	2.89	2.86	2.80	2.77	2.76	2.71
9	.025	3.96	3.77	3.67	3.60	3.56	3.47	3.43	3.40	3.33
	.010	5.26	4.96	4.81	4.71	4.65	4.52	4.45	4.41	4.31
	.001	9.89	9.24	8.90	8.69	8.55	8.26	8.11	8.04	7.93
	.100	2.32	2.24	2.20	2.17	2.16	2.12	2.10	2.09	2.06
	.050	2.98	2.85	2.77	2.73	2.70	2.64	2.60	2.59	2.54
10	.025	3.72	3.52	3.42	3.35	3.31	3.22	3.18	3.15	3.08
	.010	4.85	4.56	4.41	4.31	4.25	4.12	4.05	4.01	3.91
	.001	8.75	8.13	7.80	7.60	7.47	7.19	7.05	6.98	6.92
	.100	2.25	2.17	2.12	2.10	2.08	2.04	2.02	2.01	1.97
	.050	2.85	2.72	2.65	2.60	2.57	2.51	2.47	2.46	2.40
11	.025	3.53	3.33	3.23	3.16	3.12	3.03	2.98	2.96	2.88
	.010	4.54	4.25	4.10	4.01	3.94	3.81	3.74	3.71	3.61
	.001	7.92	7.32	7.01	6.81	6.68	6.42	6.28	6.21	6.05
	.100	2.19	2.10	2.06	2.03	2.01	1.97	1.95	1.94	1.90
	.050	2.75	2.62	2.54	2.50	2.47	2.40	2.37	2.35	2.30
12	.025	3.37	3.18	3.07	3.01	2.96	2.87	2.82	2.80	2.73
	.010	4.30	4.01	3.86	3.76	3.70	3.57	3.50	3.47	3.36
	.001	7.29	6.71	6.40	6.22	6.09	5.83	5.70	5.63	5.48
	.100	2.06	1.97	1.92	1.89	1.87	1.83	1.80	1.79	1.76
	.050	2.54	2.40	2.33	2.28	2.25	2.18	2.14	2.12	2.07
15	.025	3.06	2.86	2.76	2.69	2.64	2.55	2.50	2.47	2.40
	.010	3.80	3.52	3.37	3.28	3.21	3.08	3.01	2.98	2.87
	.001	6.08	5.54	5.25	5.07	4.95	4.70	4.57	4.51	4.35
	.100	1.98	1.89	1.84	1.80	1.78	1.74	1.71	1.70	1.66
	.050	2.41	2.27	2.19	2.14	2.11	2.04	2.00	1.98	1.92
18	.025	2.87	2.67	2.56	2.49	2.44	2.35	2.30	2.27	2.19
	.010	3.51	3.23	3.08	2.98	2.92	2.78	2.71	2.68	2.57
	.001	5.39	4.87	4.59	4.42	4.30	4.06	3.93	3.87	3.70
	.100	1.94	1.84	1.79	1.76	1.74	1.69	1.66	1.65	1.61
	.050	2.35	2.20	2.12	2.07	2.04	1.97	1.93	1.91	1.84
20	.025	2.77	2.57	2.46	2.40	2.35	2.25	2.20	2.17	2.09
	.010	3.37	3.09	2.94	2.84	2.78	2.64	2.57	2.54	2.42
	.001	5.08	4.56	4.29	4.12	4.00	3.77	3.64	3.58	3.42
	.100	1.87	1.77	1.72	1.68	1.66	1.61	1.58	1.56	1.52
	.050	2.24	2.09	2.01	1.96	1.92	1.84	1.80	1.78	1.71
25	.025	2.61	2.41	2.30	2.23	2.18	2.08	2.02	2.00	1.91
	.010	3.13	2.85	2.70	2.60	2.54	2.40	2.33	2.29	2.17
	.001	4.56	4.06	3.79	3.63	3.52	3.28	3.15	3.09	2.92
	.100	1.82	1.72	1.67	1.63	1.61	1.55	1.52	1.51	1.46
	.050	2.16	2.01	1.93	1.88	1.84	1.76	1.72	1.70	1.62
30	.025	2.51	2.31	2.20	2.12	2.07	1.97	1.91	1.88	1.79
	.010	2.98	2.70	2.55	2.45	2.39	2.25	2.17	2.13	2.01
	.001	4.24	3.75	3.49	3.33	3.22	2.98	2.86	2.79	2.61
	.100	1.76	1.66	1.61	1.57	1.54	1.48	1.45	1.43	1.38
	.050	2.08	1.92	1.84	1.78	1.74	1.66	1.61	1.59	1.51
40	.025	2.39	2.18	2.07	1.99	1.94	1.83	1.77	1.74	1.64
	.010	2.80	2.52	2.37	2.27	2.20	2.06	1.98	1.94	1.81
	.001	3.87	3.40	3.14	2.98	2.87	2.64	2.51	2.44	2.24
	.100	1.73	1.63	1.57	1.53	1.50	1.44	1.41	1.39	1.33
	.050	2.03	1.87	1.78	1.73	1.69	1.60	1.55	1.52	1.44
50	.025	2.32	2.11	1.99	1.92	1.87	1.75	1.69	1.66	1.55
	.010	2.70	2.42	2.27	2.17	2.10	1.95	1.87	1.82	1.68
	.001	3.67	3.20	2.95	2.79	2.68	2.44	2.31	2.25	2.03

TABLE A.6 *F* Values for Given Tail Areas *continued*

		υ_1 = *Degrees of Freedom for Numerator*								
υ_2	α	*10*	*15*	*20*	*25*	*30*	*50*	*75*	*100*	∞
	.100	1.71	1.60	1.54	1.50	1.48	1.41	1.38	1.36	1.29
	.050	1.99	1.84	1.75	1.69	1.65	1.56	1.51	1.48	1.39
60	.025	2.27	2.06	1.94	1.87	1.82	1.70	1.63	1.60	1.48
	.010	2.63	2.35	2.20	2.10	2.03	1.88	1.79	1.75	1.60
	.001	3.54	3.08	2.83	2.67	2.55	2.32	2.19	2.12	1.89
	.100	1.68	1.57	1.51	1.47	1.44	1.38	1.34	1.32	1.24
	.050	1.95	1.79	1.70	1.64	1.60	1.51	1.45	1.43	1.32
80	.025	2.21	2.00	1.88	1.81	1.75	1.63	1.56	1.53	1.40
	.010	2.55	2.27	2.12	2.01	1.94	1.79	1.70	1.65	1.49
	.001	3.39	2.93	2.68	2.52	2.41	2.16	2.03	1.96	1.72
	.100	1.67	1.56	1.50	1.46	1.43	1.36	1.33	1.30	1.23
	.050	1.94	1.78	1.69	1.63	1.59	1.49	1.44	1.41	1.30
90	.025	2.19	1.98	1.86	1.79	1.73	1.61	1.54	1.50	1.37
	.010	2.52	2.24	2.09	1.99	1.92	1.76	1.67	1.62	1.46
	.001	3.34	2.88	2.63	2.47	2.36	2.11	1.98	1.91	1.66
	.100	1.66	1.56	1.49	1.45	1.42	1.35	1.32	1.29	1.21
	.050	1.93	1.77	1.68	1.62	1.57	1.48	1.42	1.39	1.28
100	.025	2.18	1.97	1.85	1.77	1.71	1.59	1.52	1.48	1.35
	.010	2.50	2.22	2.07	1.97	1.89	1.74	1.65	1.60	1.43
	.001	3.30	2.84	2.59	2.43	2.32	2.08	1.94	1.87	1.62
	.100	1.60	1.49	1.42	1.38	1.34	1.26	1.21	1.18	1.00
	.050	1.83	1.67	1.57	1.51	1.46	1.35	1.28	1.24	1.00
∞	.025	2.05	1.83	1.71	1.63	1.57	1.43	1.34	1.30	1.00
	.010	2.32	2.04	1.88	1.77	1.70	1.52	1.42	1.36	1.00
	.001	2.98	2.52	2.27	2.11	1.99	1.73	1.58	1.50	1.00

TABLE A.7 Factors for 3σ Control Charts

Observations in Sample, n	$\bar{X}$ Charts			S Charts						R Charts						
	Factors for Control Limits			Factors for Central Line		Factors for Control Limits				Factors for Central Line		Factors for Control Limits				
	A	A_2	A_3	c_4	$1/c_4$	B_3	B_4	B_5	B_6	d_2	$1/d_2$	d_3	D_1	D_2	D_3	D_4
2	2.121	1.880	2.659	0.7979	1.2533	0	3.267	0	2.606	1.128	0.8865	0.853	0	3.686	0	3.267
3	1.732	1.023	1.954	0.8862	1.1284	0	2.568	0	2.276	1.693	0.5907	0.888	0	4.358	0	2.574
4	1.500	0.729	1.628	0.9213	1.0854	0	2.266	0	2.088	2.059	0.4857	0.880	0	4.698	0	2.282
5	1.342	0.577	1.427	0.9400	1.0638	0	2.089	0	1.964	2.326	0.4299	0.864	0	4.918	0	2.114
6	1.225	0.483	1.287	0.9515	1.0510	0.030	1.970	0.029	1.874	2.534	0.3946	0.848	0	5.078	0	2.004
7	1.134	0.419	1.182	0.9594	1.0423	0.118	1.882	0.113	1.806	2.704	0.3698	0.833	0.204	5.204	0.076	1.924
8	1.061	0.373	1.099	0.9650	1.0363	0.185	1.815	0.179	1.751	2.847	0.3512	0.820	0.388	5.306	0.136	1.864
9	1.000	0.337	1.032	0.9693	1.0317	0.239	1.761	0.232	1.707	2.970	0.3367	0.808	0.547	5.393	0.184	1.816
10	0.949	0.308	0.975	0.9727	1.0281	0.284	1.716	0.276	1.669	3.078	0.3249	0.797	0.687	5.469	0.223	1.777
11	0.905	0.285	0.927	0.9754	1.0252	0.321	1.679	0.313	1.637	3.173	0.3152	0.787	0.811	5.535	0.256	1.744
12	0.866	0.266	0.886	0.9776	1.0229	0.354	1.646	0.346	1.610	3.258	0.3069	0.778	0.922	5.594	0.283	1.717
13	0.832	0.249	0.850	0.9794	1.0210	0.382	1.618	0.374	1.585	3.336	0.2998	0.770	1.025	5.647	0.307	1.693
14	0.802	0.235	0.817	0.9810	1.0194	0.406	1.594	0.399	1.563	3.407	0.2935	0.763	1.118	5.696	0.328	1.672
15	0.775	0.223	0.789	0.9823	1.0180	0.428	1.572	0.421	1.544	3.472	0.2880	0.756	1.203	5.741	0.347	1.653
16	0.750	0.212	0.763	0.9835	1.0168	0.448	1.552	0.440	1.526	3.532	0.2831	0.750	1.282	5.782	0.363	1.637
17	0.728	0.203	0.739	0.9845	1.0157	0.466	1.534	0.458	1.511	3.588	0.2787	0.744	1.356	5.820	0.378	1.622
18	0.707	0.194	0.718	0.9854	1.0148	0.482	1.518	0.475	1.496	3.640	0.2747	0.739	1.424	5.856	0.391	1.608
19	0.688	0.187	0.698	0.9862	1.0140	0.497	1.503	0.490	1.483	3.689	0.2711	0.734	1.487	5.891	0.403	1.597
20	0.671	0.180	0.680	0.9869	1.0133	0.510	1.490	0.504	1.470	3.735	0.2677	0.729	1.549	5.921	0.415	1.585
21	0.655	0.173	0.663	0.9876	1.0126	0.523	1.477	0.516	1.459	3.778	0.2647	0.724	1.605	5.951	0.425	1.575
22	0.640	0.167	0.647	0.9882	1.0119	0.534	1.466	0.528	1.448	3.819	0.2618	0.720	1.659	5.979	0.434	1.566
23	0.626	0.162	0.633	0.9887	1.0114	0.545	1.455	0.539	1.438	3.858	0.2592	0.716	1.710	6.006	0.443	1.557
24	0.612	0.157	0.619	0.9892	1.0109	0.555	1.445	0.549	1.429	3.895	0.2567	0.712	1.759	6.031	0.451	1.548
25	0.600	0.153	0.606	0.9896	1.0105	0.565	1.435	0.559	1.420	3.931	0.2544	0.708	1.806	6.056	0.459	1.541

TABLE A.8 Percentage Points of the Distribution of the Relative Range

	Probability That W Is Less Than or Equal to Tabular Entry									
n	*0.001*	*0.005*	*0.010*	*0.025*	*0.050*	*0.950*	*0.975*	*0.990*	*0.995*	*0.999*
2	0.00	0.01	0.02	0.04	0.09	2.77	3.17	3.64	3.97	4.65
3	0.06	0.13	0.19	0.30	0.43	3.31	3.68	4.12	4.42	5.06
4	0.20	0.34	0.43	0.59	0.76	3.63	3.98	4.40	4.69	5.31
5	0.37	0.55	0.66	0.85	1.03	3.86	4.20	4.60	4.89	5.48
6	0.54	0.75	0.87	1.06	1.25	4.03	4.36	4.76	5.03	5.62
7	0.69	0.92	1.05	1.25	1.44	4.17	4.49	4.88	5.15	5.73
8	0.83	1.08	1.20	1.41	1.60	4.29	4.61	4.99	5.26	5.82
9	0.96	1.21	1.34	1.55	1.74	4.39	4.70	5.08	5.34	5.90
10	1.08	1.33	1.47	1.67	1.86	4.47	4.79	5.16	5.42	5.97
11	1.20	1.45	1.58	1.78	1.97	4.55	4.86	5.23	5.49	6.04
12	1.30	1.55	1.68	1.88	2.07	4.62	4.92	5.29	5.54	6.09