

Table 1: Chi-Square Probabilities

df	0.95	0.90	0.75	0.50	0.25	0.10	0.05	0.01	0.005	0.001
1	0.004	0.016	0.101	0.455	1.323	2.706	3.841	6.635	7.879	10.828
2	0.103	0.211	0.575	1.386	2.772	4.605	5.991	9.210	10.597	13.816
3	0.352	0.584	1.212	2.366	4.108	6.251	7.815	11.345	12.838	16.266
4	0.711	1.064	1.922	3.357	5.385	7.779	9.488	13.277	14.860	18.467
5	1.145	1.610	2.675	4.351	6.626	9.236	11.070	15.086	16.750	20.515
6	1.635	2.204	3.455	5.348	7.841	10.645	12.592	16.812	18.548	22.458
7	2.167	2.833	4.255	6.346	9.037	12.017	14.067	18.475	20.278	24.322
8	2.733	3.490	5.070	7.344	10.219	13.362	15.507	20.090	21.955	26.125
9	3.325	4.168	5.899	8.343	11.389	14.684	16.919	21.666	23.589	27.877
10	3.941	4.865	6.737	9.342	12.549	15.987	18.307	23.209	25.188	29.588
11	4.575	5.578	7.584	10.341	13.701	17.275	19.675	24.725	26.757	31.264
12	5.226	6.304	8.438	11.340	14.845	18.549	21.026	26.217	28.300	32.909
13	5.892	7.042	9.299	12.340	15.984	19.812	22.362	27.688	29.819	34.528
14	6.571	7.790	10.165	13.340	17.117	21.064	23.685	29.141	31.319	36.123
15	7.261	8.547	11.036	14.339	18.245	22.307	24.996	30.578	32.801	37.697
16	7.962	9.312	11.912	15.338	19.369	23.542	26.296	32.000	34.267	39.252
17	8.672	10.085	12.792	16.338	20.489	24.769	27.587	33.409	35.718	40.790
18	9.390	10.865	13.675	17.338	21.605	25.989	28.869	34.805	37.156	42.312
19	10.117	11.651	14.562	18.338	22.718	27.204	30.144	36.191	38.582	43.820
20	10.851	12.443	15.452	19.337	23.828	28.412	31.410	37.566	39.997	46.797
21	11.591	13.240	16.344	20.337	24.935	29.615	32.671	38.932	41.401	48.268
22	12.338	14.041	17.240	21.337	26.039	30.813	33.924	40.289	42.796	49.728
23	13.091	14.848	18.137	22.337	27.141	32.007	35.172	41.638	44.181	51.179
24	13.848	15.659	19.037	23.337	28.241	33.196	36.415	42.980	45.559	52.620
25	14.611	16.473	19.939	24.337	29.339	34.382	37.652	44.314	46.928	54.052

Table 2: Normal Distribution

Proportion of a normal distribution that lies beyond a normal deviate (Z).

Z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	Z
0.0	0.5000	0.4960	0.4920	0.4880	0.4840	0.4801	0.4761	0.4721	0.4681	0.4641	0.0
0.1	0.4602	0.4562	0.4522	0.4483	0.4443	0.4404	0.4364	0.4325	0.4286	0.4247	0.1
0.2	0.4207	0.4168	0.4129	0.4090	0.4052	0.4013	0.3974	0.3936	0.3897	0.3859	0.2
0.3	0.3821	0.3783	0.3745	0.3707	0.3669	0.3632	0.3594	0.3557	0.3520	0.3483	0.3
0.4	0.3446	0.3409	0.3372	0.3336	0.3300	0.3264	0.3228	0.3192	0.3156	0.3121	0.4
0.5	0.3085	0.3050	0.3015	0.2981	0.2946	0.2912	0.2877	0.2843	0.2810	0.2776	0.5
0.6	0.2743	0.2709	0.2676	0.2643	0.2611	0.2578	0.2546	0.2514	0.2483	0.2451	0.6
0.7	0.2420	0.2389	0.2358	0.2327	0.2296	0.2266	0.2236	0.2206	0.2177	0.2148	0.7
0.8	0.2119	0.2090	0.2061	0.2033	0.2005	0.1977	0.1949	0.1922	0.1894	0.1867	0.8
0.9	0.1841	0.1814	0.1788	0.1762	0.1736	0.1711	0.1685	0.1660	0.1635	0.1611	0.9
1.0	0.1587	0.1562	0.1539	0.1515	0.1492	0.1469	0.1446	0.1423	0.1401	0.1379	1.0
1.1	0.1357	0.1335	0.1314	0.1292	0.1271	0.1251	0.1230	0.1210	0.1190	0.1170	1.1
1.2	0.1151	0.1131	0.1112	0.1093	0.1075	0.1056	0.1038	0.1020	0.1003	0.0985	1.2
1.3	0.0968	0.0951	0.0934	0.0918	0.0901	0.0885	0.0869	0.0853	0.0838	0.0823	1.3
1.4	0.0808	0.0793	0.0778	0.0764	0.0749	0.0735	0.0721	0.0708	0.0694	0.0681	1.4
1.5	0.0668	0.0655	0.0643	0.0630	0.0618	0.0606	0.0594	0.0582	0.0571	0.0559	1.5
1.6	0.0548	0.0537	0.0526	0.0516	0.0505	0.0495	0.0485	0.0475	0.0465	0.0455	1.6
1.7	0.0446	0.0436	0.0427	0.0418	0.0409	0.0401	0.0392	0.0384	0.0375	0.0367	1.7
1.8	0.0359	0.0351	0.0344	0.0336	0.0329	0.0322	0.0314	0.0307	0.0301	0.0294	1.8
1.9	0.0287	0.0281	0.0274	0.0268	0.0262	0.0256	0.0250	0.0244	0.0239	0.0233	1.9
2.0	0.0228	0.0222	0.0217	0.0212	0.0207	0.0202	0.0197	0.0192	0.0188	0.0183	2.0
2.1	0.0179	0.0174	0.0170	0.0166	0.0162	0.0158	0.0154	0.0150	0.0146	0.0143	2.1
2.2	0.0139	0.0136	0.0132	0.0129	0.0125	0.0122	0.0119	0.0116	0.0113	0.0110	2.2
2.3	0.0107	0.0104	0.0102	0.0099	0.0096	0.0094	0.0091	0.0089	0.0087	0.0084	2.3
2.4	0.0082	0.0080	0.0078	0.0075	0.0073	0.0071	0.0069	0.0068	0.0066	0.0064	2.4
2.5	0.0062	0.0060	0.0059	0.0057	0.0055	0.0054	0.0052	0.0051	0.0049	0.0048	2.5
2.6	0.0047	0.0045	0.0044	0.0043	0.0041	0.0040	0.0039	0.0038	0.0037	0.0036	2.6
2.7	0.0035	0.0034	0.0033	0.0032	0.0031	0.0030	0.0029	0.0028	0.0027	0.0026	2.7
2.8	0.0026	0.0025	0.0024	0.0023	0.0023	0.0022	0.0021	0.0021	0.0020	0.0019	2.8
2.9	0.0019	0.0018	0.0018	0.0017	0.0016	0.0016	0.0015	0.0015	0.0014	0.0014	2.9
3.0	0.0013	0.0013	0.0013	0.0012	0.0012	0.0011	0.0011	0.0001	0.0010	0.0010	3.0

Table 3: t Distribution

Cumulative t distribution

$\alpha(2):$	0.5	0.3	0.2	0.1	0.05	0.02	0.01	0.002	0.001
df $\alpha(1):$	0.25	0.15	0.1	0.05	0.025	0.01	0.005	0.001	0.0005
1	1	1.963	3.078	6.314	12.710	31.820	63.660	318.289	636.600
2	0.816	1.386	1.886	2.920	4.303	6.965	9.925	22.328	31.600
3	0.765	1.250	1.638	2.353	3.182	4.541	5.841	10.214	12.920
4	0.741	1.190	1.533	2.132	2.776	3.747	4.604	7.173	8.610
5	0.727	1.156	1.476	2.015	2.571	3.365	4.032	5.894	6.869
6	0.718	1.134	1.440	1.943	2.447	3.143	3.707	5.208	5.959
7	0.711	1.119	1.415	1.895	2.365	2.998	3.499	4.785	5.408
8	0.706	1.108	1.397	1.860	2.306	2.896	3.355	4.501	5.041
9	0.703	1.100	1.383	1.833	2.262	2.821	3.250	4.297	4.781
10	0.7	1.093	1.372	1.812	2.228	2.764	3.169	4.144	4.587
11	0.697	1.088	1.363	1.796	2.201	2.718	3.106	4.025	4.437
12	0.695	1.083	1.356	1.782	2.179	2.681	3.055	3.930	4.318
13	0.694	1.079	1.350	1.771	2.160	2.650	3.012	3.852	4.221
14	0.692	1.076	1.345	1.761	2.145	2.624	2.977	3.787	4.140
15	0.691	1.074	1.341	1.753	2.131	2.602	2.947	3.733	4.073
16	0.69	1.071	1.337	1.746	2.120	2.583	2.921	3.686	4.015
17	0.689	1.069	1.333	1.740	2.110	2.567	2.898	3.646	3.965
18	0.688	1.067	1.330	1.734	2.101	2.552	2.878	3.610	3.922
19	0.688	1.066	1.328	1.729	2.093	2.539	2.861	3.579	3.885
20	0.687	1.064	1.325	1.725	2.086	2.528	2.845	3.552	3.850
21	0.686	1.063	1.323	1.721	2.080	2.518	2.831	3.527	3.819
22	0.685	1.061	1.321	1.717	2.074	2.508	2.819	3.505	3.792
23	0.685	1.060	1.319	1.714	2.069	2.500	2.807	3.485	3.768
24	0.684	1.059	1.318	1.711	2.064	2.492	2.797	3.467	3.745
25	0.684	1.058	1.316	1.708	2.060	2.485	2.787	3.450	3.725
26	0.684	1.058	1.315	1.706	2.056	2.479	2.779	3.435	3.707
27	0.683	1.057	1.314	1.703	2.052	2.473	2.771	3.421	3.690
28	0.683	1.056	1.313	1.701	2.048	2.467	2.763	3.408	3.674
29	0.683	1.055	1.311	1.699	2.045	2.462	2.756	3.396	3.659
30	0.681	1.055	1.310	1.697	2.042	2.457	2.750	3.385	3.646
40	0.681	1.050	1.303	1.684	2.021	2.423	2.704	3.307	3.551
50	0.679	1.047	1.295	1.676	2.009	2.403	2.678	3.261	3.496
60	0.679	1.045	1.296	1.671	2.000	2.390	2.660	3.232	3.460
80	0.678	1.043	1.292	1.664	1.990	2.374	2.639	3.195	3.416
100	0.677	0.845	1.290	1.660	1.984	2.364	2.626	3.174	3.390

Table 4: F distribution

	P	1	2	3	4	5	6	7	8	9	10
1	0.05	161.45	199.50	215.71	224.58	230.16	233.99	236.77	238.88	240.54	241.88
	0.025	647.79	799.48	864.15	899.60	921.83	937.11	948.20	956.64	963.28	968.63
	0.01	4052.2	4999.3	5403.5	5624.3	5764.0	5859.0	5928.3	5981.0	6022.4	6055.9
2	0.05	18.513	19.000	19.164	19.247	19.296	19.329	19.353	19.371	19.385	19.396
	0.025	38.506	39.000	39.166	39.248	39.298	39.331	39.356	39.373	39.387	39.398
	0.01	98.502	99.000	99.164	99.251	99.302	99.331	99.357	99.375	99.390	99.397
3	0.05	10.128	9.552	9.277	9.117	9.013	8.941	8.887	8.845	8.812	8.785
	0.025	17.443	16.044	15.439	15.101	14.885	14.735	14.624	14.540	14.473	14.419
	0.01	34.116	30.816	29.457	28.710	28.237	27.911	27.671	27.489	27.345	27.228
4	0.05	7.709	6.944	6.591	6.388	6.256	6.163	6.094	6.041	5.999	5.964
	0.025	12.218	10.649	9.979	9.604	9.364	9.197	9.074	8.980	8.905	8.844
	0.01	21.198	18.000	16.694	15.977	15.522	15.207	14.976	14.799	14.659	14.546
5	0.05	6.608	5.786	5.409	5.192	5.050	4.950	4.876	4.818	4.772	4.735
	0.025	10.007	8.434	7.764	7.388	7.146	6.978	6.853	6.757	6.681	6.619
	0.01	16.258	13.274	12.060	11.392	10.967	10.672	10.456	10.289	10.158	10.051
6	0.05	5.987	5.143	4.757	4.534	4.387	4.284	4.207	4.147	4.099	4.060
	0.025	8.813	7.260	6.599	6.227	5.988	5.820	5.695	5.600	5.523	5.461
	0.01	13.745	10.925	9.780	9.148	8.746	8.466	8.260	8.102	7.976	7.874
7	0.05	5.591	4.737	4.347	4.120	3.972	3.866	3.787	3.726	3.677	3.637
	0.025	8.073	6.542	5.890	5.523	5.285	5.119	4.995	4.899	4.823	4.761
	0.01	12.246	9.547	8.451	7.847	7.460	7.191	6.993	6.840	6.719	6.620
8	0.05	5.318	4.459	4.066	3.838	3.688	3.581	3.500	3.438	3.388	3.347
	0.025	7.571	6.059	5.416	5.053	4.817	4.652	4.529	4.433	4.357	4.295
	0.01	11.259	8.649	7.591	7.006	6.632	6.371	6.178	6.029	5.911	5.814
9	0.05	5.117	4.256	3.863	3.633	3.482	3.374	3.293	3.230	3.179	3.137
	0.025	7.209	5.715	5.078	4.718	4.484	4.320	4.197	4.102	4.026	3.964
	0.01	10.562	8.022	6.992	6.422	6.057	5.802	5.613	5.467	5.351	5.257
10	0.05	4.965	4.103	3.708	3.478	3.326	3.217	3.135	3.072	3.020	2.978
	0.025	6.937	5.456	4.826	4.468	4.236	4.072	3.950	3.855	3.779	3.717
	0.01	10.044	7.559	6.552	5.994	5.636	5.386	5.200	5.057	4.942	4.849
15	0.05	4.543	3.682	3.287	3.056	2.901	2.790	2.707	2.641	2.588	2.544
	0.025	6.200	4.765	4.153	3.804	3.576	3.415	3.293	3.199	3.123	3.060
	0.01	8.683	6.359	5.417	4.893	4.556	4.318	4.142	4.004	3.895	3.805
20	0.05	4.351	3.493	3.098	2.866	2.711	2.599	2.514	2.447	2.393	2.348
	0.025	5.871	4.461	3.859	3.515	3.289	3.128	3.007	2.913	2.837	2.774
	0.01	8.096	5.849	4.938	4.431	4.103	3.871	3.699	3.564	3.457	3.368
25	0.05	4.242	3.385	2.991	2.759	2.603	2.490	2.405	2.337	2.282	2.236
	0.025	5.686	4.291	3.694	3.353	3.129	2.969	2.848	2.753	2.677	2.613
	0.01	7.770	5.568	4.675	4.177	3.855	3.627	3.457	3.324	3.217	3.129
30	0.05	4.171	3.316	2.922	2.690	2.534	2.421	2.334	2.266	2.211	2.165
	0.025	5.568	4.182	3.589	3.250	3.026	2.867	2.746	2.651	2.575	2.511
	0.01	7.562	5.390	4.510	4.018	3.699	3.473	3.305	3.173	3.067	2.979
40	0.05	4.085	3.232	2.839	2.606	2.449	2.336	2.249	2.180	2.124	2.077
	0.025	5.424	4.051	3.463	3.126	2.904	2.744	2.624	2.529	2.452	2.388
	0.01	7.314	5.178	4.313	3.828	3.514	3.291	3.124	2.993	2.888	2.801
50	0.05	4.034	3.183	2.790	2.557	2.400	2.286	2.199	2.130	2.073	2.026
	0.025	5.340	3.975	3.390	3.054	2.833	2.674	2.553	2.458	2.381	2.317
	0.01	7.171	5.057	4.199	3.720	3.408	3.186	3.020	2.890	2.785	2.698
60	0.05	4.001	3.150	2.758	2.525	2.368	2.254	2.167	2.097	2.040	1.993
	0.025	5.286	3.925	3.343	3.008	2.786	2.627	2.507	2.412	2.334	2.270
	0.01	7.077	4.977	4.126	3.649	3.339	3.119	2.953	2.823	2.718	2.632

Table 5: Critical values of q

Values of q at P=0.05. The body of the table contains the q value where the top row is p, the number of items (e.g., means) over which the range is computed, and the left hand column is the degrees of freedom (e.g, df of MS error).

<u>df</u>	<u>p=2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>
1	17.97	26.98	32.82	37.08	40.41	43.12	45.40	47.36	49.07
2	6.085	8.331	9.798	10.88	11.74	12.44	13.03	13.54	13.99
3	4.501	5.910	6.825	7.502	8.037	8.478	8.853	9.177	9.462
4	3.927	5.040	5.757	6.287	6.707	7.053	7.347	7.602	7.826
5	3.635	4.602	5.218	5.673	6.033	6.330	6.582	6.802	6.995
6	3.461	4.339	4.896	5.305	5.628	5.895	6.122	6.319	6.493
7	3.344	4.165	4.681	5.060	5.359	5.606	5.815	5.998	6.158
8	3.261	4.041	4.529	4.886	5.167	5.399	5.597	5.767	5.918
9	3.199	3.949	4.415	4.756	5.024	5.244	5.432	5.595	5.739
10	3.151	3.877	4.327	4.654	4.912	5.124	5.305	5.461	5.599
11	3.113	3.820	4.256	4.574	4.823	5.028	5.202	5.353	5.487
12	3.082	3.773	4.199	4.508	4.751	4.950	5.119	5.265	5.395
13	3.055	3.735	4.151	4.453	4.690	4.885	5.049	5.192	5.318
14	3.033	3.702	4.111	4.407	4.639	4.829	4.990	5.131	5.254
15	3.014	3.674	4.076	4.367	4.595	4.782	4.940	5.077	5.198
16	2.998	3.649	4.046	4.333	4.557	4.741	4.897	5.031	5.150
17	2.984	3.628	4.020	4.303	4.524	4.705	4.858	4.991	5.108
18	2.971	3.609	3.997	4.277	4.495	4.673	4.824	4.956	5.071
19	2.960	3.593	3.977	4.253	4.469	4.645	4.794	4.924	5.038
20	2.950	3.578	3.958	4.232	4.445	4.620	4.768	4.896	5.008
24	2.919	3.532	3.901	4.166	4.373	4.541	4.684	4.807	4.915
30	2.888	3.486	3.845	4.102	4.302	4.464	4.602	4.720	4.824
40	2.858	3.442	3.791	4.039	4.232	4.389	4.521	4.635	4.735
60	2.829	3.399	3.737	3.977	4.163	4.314	4.441	4.550	4.646
120	2.800	3.356	3.685	3.917	4.096	4.241	4.363	4.468	4.560
inf	2.772	3.314	3.633	3.858	4.030	4.170	4.286	4.387	4.474

