Studentized Range q Table

The following tables provide the critical values for $q(k, df, \alpha)$ when α = .10, .05, .025, 01, .005 and .= 001. See Unplanned Comparisons for ANOVA for more details.

Alpha 0.10

	k -->																		
df	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	8.929	13.437	16.358	18.488	20.150	21.504	22.642	23.621	24.477	25.237	25.918	26.536	27.100	27.618	28.097	28.542	28.958	29.347	29.713
2	4.129	5.733	6.772	7.538	8.139	8.633	9.049	9.409	9.725	10.006	10.259	10.488	10.698	10.891	11.070	11.237	11.392	11.538	11.676
3	3.328	4.467	5.199	5.738	6.162	6.511	6.806	7.062	7.287	7.487	7.667	7.831	7.982	8.120	8.248	8.368	8.479	8.584	8.683
4	3.015	3.976	4.586	5.035	5.388	5.679	5.926	6.139	6.327	6.494	6.645	6.783	6.909	7.025	7.132	7.233	7.326	7.414	7.497
5	2.850	3.717	4.264	4.664	4.979	5.238	5.458	5.648	5.816	5.965	6.100	6.223	6.336	6.439	6.536	6.626	6.710	6.788	6.863
6	2.748	3.558	4.065	4.435	4.726	4.966	5.168	5.344	5.499	5.637	5.762	5.875	5.979	6.075	6.164	6.247	6.325	6.398	6.466
7	2.679	3.451	3.931	4.280	4.555	4.780	4.971	5.137	5.283	5.413	5.530	5.637	5.735	5.826	5.910	5.988	6.061	6.130	6.195
8	2.630	3.374	3.834	4.169	4.431	4.646	4.829	4.987	5.126	5.250	5.362	5.464	5.558	5.644	5.724	5.799	5.869	5.935	5.997
9	2.592	3.316	3.761	4.084	4.337	4.545	4.721	4.873	5.007	5.126	5.234	5.333	5.423	5.506	5.583	5.655	5.722	5.786	5.845
10	2.563	3.270	3.704	4.018	4.264	4.465	4.636	4.783	4.913	5.029	5.134	5.229	5.316	5.397	5.472	5.542	5.607	5.668	5.726
11	2.540	3.234	3.658	3.965	4.205	4.401	4.567	4.711	4.838	4.951	5.053	5.145	5.231	5.309	5.382	5.450	5.514	5.573	5.630
12	2.521	3.204	3.621	3.921	4.156	4.349	4.511	4.652	4.776	4.886	4.986	5.076	5.160	5.236	5.308	5.374	5.436	5.495	5.550
13	2.504	3.179	3.589	3.885	4.116	4.304	4.464	4.602	4.724	4.832	4.930	5.019	5.100	5.175	5.245	5.310	5.371	5.429	5.483
14	2.491	3.158	3.563	3.854	4.081	4.267	4.424	4.560	4.679	4.786	4.882	4.969	5.050	5.124	5.192	5.256	5.316	5.372	5.426
15	2.479	3.140	3.540	3.828	4.052	4.235	4.390	4.524	4.641	4.746	4.841	4.927	5.006	5.079	5.146	5.209	5.268	5.324	5.376
16	2.469	3.124	3.520	3.804	4.026	4.207	4.360	4.492	4.608	4.712	4.805	4.890	4.968	5.040	5.106	5.169	5.227	5.282	5.333
17	2.460	3.110	3.503	3.784	4.003	4.182	4.334	4.464	4.579	4.681	4.774	4.857	4.934	5.005	5.071	5.133	5.190	5.244	5.295
18	2.452	3.098	3.487	3.766	3.984	4.161	4.310	4.440	4.553	4.654	4.746	4.829	4.905	4.975	5.040	5.101	5.158	5.211	5.262
19	2.445	3.087	3.474	3.751	3.966	4.142	4.290	4.418	4.530	4.630	4.721	4.803	4.878	4.948	5.012	5.072	5.129	5.182	5.232
20	2.439	3.077	3.462	3.736	3.950	4.124	4.271	4.398	4.510	4.609	4.699	4.780	4.855	4.923	4.987	5.047	5.103	5.155	5.205
21	2.433	3.069	3.451	3.724	3.936	4.109	4.255	4.380	4.491	4.590	4.678	4.759	4.833	4.901	4.965	5.024	5.079	5.131	5.180
22	2.428	3.061	3.441	3.712	3.923	4.095	4.239	4.364	4.474	4.572	4.660	4.740	4.814	4.882	4.944	5.003	5.058	5.109	5.158
23	2.424	3.054	3.432	3.701	3.911	4.082	4.226	4.350	4.459	4.556	4.644	4.723	4.796	4.863	4.926	4.984	5.038	5.089	5.138
24	2.420	3.047	3.423	3.692	3.900	4.070	4.213	4.336	4.445	4.541	4.628	4.707	4.780	4.847	4.909	4.966	5.020	5.071	5.119
25	2.416	3.041	3.416	3.683	3.890	4.059	4.201	4.324	4.432	4.528	4.614	4.693	4.765	4.831	4.893	4.950	5.004	5.055	5.102

df	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
26	2.412	3.036	3.409	3.675	3.881	4.049	4.191	4.313	4.420	4.515	4.601	4.680	4.751	4.817	4.878	4.936	4.989	5.039	5.086
27	2.409	3.030	3.402	3.667	3.873	4.040	4.181	4.302	4.409	4.504	4.590	4.667	4.739	4.804	4.865	4.922	4.975	5.025	5.072
28	2.406	3.026	3.396	3.660	3.865	4.032	4.172	4.293	4.399	4.493	4.579	4.656	4.727	4.792	4.853	4.909	4.962	5.012	5.058
29	2.403	3.021	3.391	3.654	3.858	4.024	4.163	4.284	4.389	4.484	4.568	4.645	4.716	4.781	4.841	4.897	4.950	4.999	5.046
30	2.400	3.017	3.386	3.648	3.851	4.016	4.155	4.275	4.381	4.474	4.559	4.635	4.706	4.770	4.830	4.886	4.939	4.988	5.034
31	2.398	3.013	3.381	3.642	3.845	4.009	4.148	4.268	4.372	4.466	4.550	4.626	4.696	4.760	4.820	4.876	4.928	4.977	5.023
32	2.396	3.010	3.376	3.637	3.839	4.003	4.141	4.260	4.365	4.458	4.541	4.617	4.687	4.751	4.811	4.866	4.918	4.967	5.013
33	2.393	3.006	3.372	3.632	3.833	3.997	4.135	4.253	4.357	4.450	4.533	4.609	4.679	4.743	4.802	4.857	4.909	4.957	5.003
34	2.391	3.003	3.368	3.627	3.828	3.991	4.129	4.247	4.351	4.443	4.526	4.602	4.671	4.734	4.794	4.849	4.900	4.949	4.994
35	2.389	3.000	3.364	3.623	3.823	3.986	4.123	4.241	4.344	4.436	4.519	4.594	4.663	4.727	4.786	4.841	4.892	4.940	4.986
36	2.388	2.998	3.361	3.619	3.819	3.981	4.117	4.235	4.338	4.430	4.512	4.588	4.656	4.720	4.778	4.833	4.884	4.932	4.978
37	2.386	2.995	3.357	3.615	3.814	3.976	4.112	4.230	4.332	4.424	4.506	4.581	4.650	4.713	4.771	4.826	4.877	4.925	4.970
38	2.384	2.992	3.354	3.611	3.810	3.972	4.107	4.224	4.327	4.418	4.500	4.575	4.643	4.706	4.765	4.819	4.870	4.918	4.963
39	2.383	2.990	3.351	3.608	3.806	3.967	4.103	4.220	4.322	4.413	4.495	4.569	4.637	4.700	4.758	4.812	4.863	4.911	4.956
40	2.381	2.988	3.348	3.605	3.802	3.963	4.099	4.215	4.317	4.408	4.490	4.564	4.632	4.694	4.752	4.806	4.857	4.904	4.949
48	2.372	2.973	3.330	3.583	3.778	3.937	4.070	4.185	4.285	4.375	4.455	4.528	4.595	4.656	4.713	4.766	4.816	4.863	4.907
60	2.363	2.959	3.312	3.562	3.755	3.911	4.042	4.155	4.254	4.342	4.421	4.493	4.558	4.619	4.675	4.727	4.775	4.821	4.864
80	2.353	2.945	3.294	3.541	3.731	3.885	4.014	4.125	4.223	4.309	4.387	4.457	4.521	4.581	4.636	4.687	4.735	4.780	4.822
120	2.344	2.930	3.276	3.520	3.707	3.859	3.986	4.096	4.191	4.276	4.353	4.422	4.485	4.543	4.597	4.647	4.694	4.738	4.779
240	2.335	2.916	3.258	3.499	3.684	3.834	3.959	4.066	4.160	4.244	4.319	4.386	4.448	4.505	4.558	4.607	4.653	4.696	4.737
inf	2.326	2.902	3.240	3.478	3.661	3.808	3.931	4.037	4.129	4.211	4.285	4.351	4.412	4.468	4.519	4.568	4.612	4.654	4.694

df	20	22	24	26	28	30	32	34	36	38	40	50	60	70	80	90	100
1	29.71	30.39	30.99	31.54	32.04	32.5	32.93	33.33	33.71	34.06	34.38	35.79	36.91	37.83	38.62	39.3	39.91
2	11.68	11.93	12.16	12.36	12.55	12.73	12.89	13.04	13.18	13.31	13.44	13.97	14.40	14.75	15.05	15.31	15.54
3	8.683	8.864	9.029	9.177	9.314	9.440	9.557	9.666	9.768	9.864	9.954	10.34	10.65	10.91	11.12	11.31	11.48
4	7.497	7.650	7.789	7.914	8.029	8.135	8.234	8.326	8.412	8.493	8.569	8.806	9.156	9.373	9.557	9.718	9.860
5	6.863	7.000	7.123	7.236	7.340	7.435	7.523	7.606	7.683	7.756	7.825	8.118	8.353	8.548	8.715	8.859	8.988
6	6.466	6.593	6.708	6.812	6.908	6.996	7.078	7.155	7.227	7.294	7.358	7.630	7.848	8.029	8.184	8.319	8.438
7	6.195	6.315	6.422	6.521	6.611	6.695	6.773	6.845	6.913	6.976	7.036	7.294	7.500	7.672	7.818	7.946	8.059
8	5.997	6.111	6.214	6.308	6.395	6.475	6.549	6.618	6.683	6.744	6.801	7.048	7.245	7.409	7.550	7.672	7.780
9	5.845	5.956	6.055	6.146	6.229	6.306	6.378	6.444	6.507	6.566	6.621	6.859	7.050	7.208	7.343	7.461	7.566
10	5.726	5.833	5.930	6.017	6.098	6.173	6.242	6.307	6.368	6.425	6.479	6.709	6.895	7.048	7.180	7.295	7.396
11	5.630	5.734	5.828	5.914	5.992	6.065	6.132	6.196	6.255	6.310	6.363	6.588	6.768	6.918	7.047	7.158	7.258
12	5.550	5.652	5.744	5.827	5.904	5.976	6.042	6.103	6.161	6.215	6.267	6.487	6.663	6.810	6.936	7.045	7.142
13	5.483	5.583	5.673	5.755	5.830	5.900	5.965	6.025	6.082	6.135	6.186	6.402	6.575	6.719	6.842	6.949	7.045
14	5.426	5.524	5.612	5.693	5.767	5.836	5.899	5.959	6.014	6.067	6.116	6.329	6.499	6.641	6.762	6.868	6.961
15	5.376	5.473	5.560	5.639	5.713	5.780	5.843	5.901	5.956	6.008	6.057	6.266	6.433	6.573	6.692	6.796	6.888
16	5.333	5.428	5.515	5.593	5.665	5.732	5.793	5.851	5.905	5.956	6.004	6.210	6.376	6.513	6.631	6.734	6.825
17	5.295	5.389	5.474	5.552	5.623	5.689	5.750	5.806	5.860	5.910	5.958	6.162	6.325	6.461	6.577	6.679	6.769
18	5.262	5.355	5.439	5.515	5.585	5.650	5.711	5.767	5.820	5.870	5.917	6.113	6.280	6.414	6.529	6.630	6.719
19	5.232	5.324	5.407	5.483	5.552	5.616	5.676	5.732	5.784	5.833	5.880	6.079	6.239	6.372	6.486	6.585	6.674
20	5.205	5.296	5.378	5.453	5.522	5.586	5.645	5.700	5.752	5.801	5.847	6.044	6.203	6.335	6.447	6.546	6.633
24	5.119	5.208	5.287	5.360	5.427	5.489	5.546	5.600	5.650	5.697	5.741	5.933	6.086	6.214	6.324	6.419	6.503
30	5.034	5.120	5.197	5.267	5.332	5.392	5.447	5.499	5.547	5.593	5.636	5.821	5.969	6.093	6.198	6.291	6.372
40	4.949	5.032	5.107	5.174	5.236	5.294	5.347	5.397	5.444	5.488	5.529	5.708	5.850	5.969	6.071	6.160	6.238
60	4.864	4.944	5.015	5.081	5.141	5.196	5.247	5.295	5.340	5.382	5.422	5.593	5.730	5.844	5.941	6.026	6.102
120	4.779	4.656	4.924	4.987	5.044	5.097	5.146	5.192	5.235	5.275	5.313	5.476	5.606	5.715	5.808	5.888	5.960
inf	4.694	4.767	4.832	4.892	4.947	4.997	5.044	5.087	5.128	5.166	5.202	5.357	5.480	5.582	5.669	5.745	5.812

Alpha = 0.05

	k -->																		
df	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	17.969	26.976	32.819	37.082	40.408	43.119	45.397	47.357	49.071	50.592	51.957	53.194	54.323	55.361	56.320	57.212	58.044	58.824	59.558
2	6.085	8.331	9.798	10.881	11.734	12.435	13.027	13.539	13.988	14.389	14.749	15.076	15.375	15.650	15.905	16.143	16.365	16.573	16.769
3	4.501	5.910	6.825	7.502	8.037	8.478	8.852	9.177	9.462	9.717	9.946	10.155	10.346	10.522	10.686	10.838	10.980	11.114	11.240
4	3.926	5.040	5.757	6.287	6.706	7.053	7.347	7.602	7.826	8.027	8.208	8.373	8.524	8.664	8.793	8.914	9.027	9.133	9.233
5	3.635	4.602	5.218	5.673	6.033	6.330	6.582	6.801	6.995	7.167	7.323	7.466	7.596	7.716	7.828	7.932	8.030	8.122	8.208
6	3.460	4.339	4.896	5.305	5.628	5.895	6.122	6.319	6.493	6.649	6.789	6.917	7.034	7.143	7.244	7.338	7.426	7.508	7.586
7	3.344	4.165	4.681	5.060	5.359	5.606	5.815	5.997	6.158	6.302	6.431	6.550	6.658	6.759	6.852	6.939	7.020	7.097	7.169
8	3.261	4.041	4.529	4.886	5.167	5.399	5.596	5.767	5.918	6.053	6.175	6.287	6.389	6.483	6.571	6.653	6.729	6.801	6.869
9	3.199	3.948	4.415	4.755	5.024	5.244	5.432	5.595	5.738	5.867	5.983	6.089	6.186	6.276	6.359	6.437	6.510	6.579	6.643
10	3.151	3.877	4.327	4.654	4.912	5.124	5.304	5.460	5.598	5.722	5.833	5.935	6.028	6.114	6.194	6.269	6.339	6.405	6.467
11	3.113	3.820	4.256	4.574	4.823	5.028	5.202	5.353	5.486	5.605	5.713	5.811	5.901	5.984	6.062	6.134	6.202	6.265	6.325
12	3.081	3.773	4.199	4.508	4.750	4.950	5.119	5.265	5.395	5.510	5.615	5.710	5.797	5.878	5.953	6.023	6.089	6.151	6.209
13	3.055	3.734	4.151	4.453	4.690	4.884	5.049	5.192	5.318	5.431	5.533	5.625	5.711	5.789	5.862	5.931	5.995	6.055	6.112
14	3.033	3.701	4.111	4.407	4.639	4.829	4.990	5.130	5.253	5.364	5.463	5.554	5.637	5.714	5.785	5.852	5.915	5.973	6.029
15	3.014	3.673	4.076	4.367	4.595	4.782	4.940	5.077	5.198	5.306	5.403	5.492	5.574	5.649	5.719	5.785	5.846	5.904	5.958
16	2.998	3.649	4.046	4.333	4.557	4.741	4.896	5.031	5.150	5.256	5.352	5.439	5.519	5.593	5.662	5.726	5.786	5.843	5.896
17	2.984	3.628	4.020	4.303	4.524	4.705	4.858	4.991	5.108	5.212	5.306	5.392	5.471	5.544	5.612	5.675	5.734	5.790	5.842
18	2.971	3.609	3.997	4.276	4.494	4.673	4.824	4.955	5.071	5.173	5.266	5.351	5.429	5.501	5.567	5.629	5.688	5.743	5.794
19	2.960	3.593	3.977	4.253	4.468	4.645	4.794	4.924	5.037	5.139	5.231	5.314	5.391	5.462	5.528	5.589	5.647	5.701	5.752
20	2.950	3.578	3.958	4.232	4.445	4.620	4.768	4.895	5.008	5.108	5.199	5.282	5.357	5.427	5.492	5.553	5.610	5.663	5.714
21	2.941	3.565	3.942	4.213	4.424	4.597	4.743	4.870	4.981	5.081	5.170	5.252	5.327	5.396	5.460	5.520	5.576	5.629	5.679
22	2.933	3.553	3.927	4.196	4.405	4.577	4.722	4.847	4.957	5.056	5.144	5.225	5.299	5.368	5.431	5.491	5.546	5.599	5.648
23	2.926	3.542	3.914	4.180	4.388	4.558	4.702	4.826	4.935	5.033	5.121	5.201	5.274	5.342	5.405	5.464	5.519	5.571	5.620
24	2.919	3.532	3.901	4.166	4.373	4.541	4.684	4.807	4.915	5.012	5.099	5.179	5.251	5.319	5.381	5.439	5.494	5.545	5.594
25	2.913	3.523	3.890	4.153	4.358	4.526	4.667	4.789	4.897	4.993	5.079	5.158	5.230	5.297	5.359	5.417	5.471	5.522	5.570

df	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
26	2.907	3.514	3.880	4.141	4.345	4.511	4.652	4.773	4.880	4.975	5.061	5.139	5.211	5.277	5.339	5.396	5.450	5.500	5.548
27	2.902	3.506	3.870	4.130	4.333	4.498	4.638	4.758	4.864	4.959	5.044	5.122	5.193	5.259	5.320	5.377	5.430	5.480	5.528
28	2.897	3.499	3.861	4.120	4.322	4.486	4.625	4.745	4.850	4.944	5.029	5.106	5.177	5.242	5.302	5.359	5.412	5.462	5.509
29	2.892	3.493	3.853	4.111	4.311	4.475	4.613	4.732	4.837	4.930	5.014	5.091	5.161	5.226	5.286	5.342	5.395	5.445	5.491
30	2.888	3.486	3.845	4.102	4.301	4.464	4.601	4.720	4.824	4.917	5.001	5.077	5.147	5.211	5.271	5.327	5.379	5.429	5.475
31	2.884	3.481	3.838	4.094	4.292	4.454	4.591	4.709	4.812	4.905	4.988	5.064	5.134	5.198	5.257	5.313	5.365	5.414	5.460
32	2.881	3.475	3.832	4.086	4.284	4.445	4.581	4.698	4.802	4.894	4.976	5.052	5.121	5.185	5.244	5.299	5.351	5.400	5.445
33	2.877	3.470	3.825	4.079	4.276	4.436	4.572	4.689	4.791	4.883	4.965	5.040	5.109	5.173	5.232	5.287	5.338	5.386	5.432
34	2.874	3.465	3.820	4.072	4.268	4.428	4.563	4.680	4.782	4.873	4.955	5.030	5.098	5.161	5.220	5.275	5.326	5.374	5.420
35	2.871	3.461	3.814	4.066	4.261	4.421	4.555	4.671	4.773	4.863	4.945	5.020	5.088	5.151	5.209	5.264	5.315	5.362	5.408
36	2.868	3.457	3.809	4.060	4.255	4.414	4.547	4.663	4.764	4.855	4.936	5.010	5.078	5.141	5.199	5.253	5.304	5.352	5.397
37	2.865	3.453	3.804	4.054	4.249	4.407	4.540	4.655	4.756	4.846	4.927	5.001	5.069	5.131	5.189	5.243	5.294	5.341	5.386
38	2.863	3.449	3.799	4.049	4.243	4.400	4.533	4.648	4.749	4.838	4.919	4.993	5.060	5.122	5.180	5.234	5.284	5.331	5.376
39	2.861	3.445	3.795	4.044	4.237	4.394	4.527	4.641	4.741	4.831	4.911	4.985	5.052	5.114	5.171	5.225	5.275	5.322	5.367
40	2.858	3.442	3.791	4.039	4.232	4.388	4.521	4.634	4.735	4.824	4.904	4.977	5.044	5.106	5.163	5.216	5.266	5.313	5.358
48	2.843	3.420	3.764	4.008	4.197	4.351	4.481	4.592	4.690	4.777	4.856	4.927	4.993	5.053	5.109	5.161	5.210	5.256	5.299
60	2.829	3.399	3.737	3.977	4.163	4.314	4.441	4.550	4.646	4.732	4.808	4.878	4.942	5.001	5.056	5.107	5.154	5.199	5.241
80	2.814	3.377	3.711	3.947	4.129	4.277	4.402	4.509	4.603	4.686	4.761	4.829	4.892	4.949	5.003	5.052	5.099	5.142	5.183
120	2.800	3.356	3.685	3.917	4.096	4.241	4.363	4.468	4.560	4.641	4.714	4.781	4.842	4.898	4.950	4.998	5.043	5.086	5.126
240	2.786	3.335	3.659	3.887	4.063	4.205	4.324	4.427	4.517	4.596	4.668	4.733	4.792	4.847	4.897	4.944	4.988	5.030	5.069
inf	2.772	3.314	3.633	3.858	4.030	4.170	4.286	4.387	4.474	4.552	4.622	4.685	4.743	4.796	4.845	4.891	4.934	4.974	5.012

df	20	22	24	26	28	30	32	34	36	38	40	50	60	70	80	90	100
1	59.56	60.91	62.12	63.22	64.23	65.15	66.01	66.81	67.56	68.26	68.92	71.73	73.97	75.82	77.4	78.77	79.98
2	16.77	17.13	17.45	17.75	18.02	18.27	18.5	18.72	18.92	19.11	19.28	20.05	20.66	21.16	21.59	21.96	22.29
3	11.24	11.47	11.68	11.87	12.05	12.21	12.36	12.50	12.63	12.75	12.87	13.36	13.76	14.08	14.36	14.61	14.82
4	9.233	9.418	9.584	9.736	9.875	10.00	10.12	10.23	10.34	10.44	10.53	10.93	11.24	11.51	11.73	11.92	12.09
5	8.208	8.368	8.512	8.643	8.764	8.875	8.979	9.075	9.165	9.250	9.330	9.674	9.949	10.18	10.38	10.54	10.69
6	7.587	7.730	7.861	7.979	8.088	8.189	8.283	8.370	8.452	8.529	8.601	8.913	9.163	9.370	9.548	9.702	9.839
7	7.170	7.303	7.423	7.533	7.634	7.728	7.814	7.895	7.972	8.043	8.110	8.400	8.632	8.824	8.989	9.133	9.261
8	6.870	6.995	7.109	7.212	7.307	7.395	7.477	7.554	7.625	7.693	7.756	8.029	8.248	8.430	8.586	8.722	8.843
9	6.644	6.763	6.871	6.970	7.061	7.145	7.222	7.295	7.363	7.428	7.488	7.749	7.958	8.132	8.281	8.410	8.526
10	6.467	6.582	6.686	6.781	6.868	6.948	7.023	7.093	7.159	7.220	7.279	7.529	7.730	7.897	8.041	8.166	8.276
11	6.326	6.436	6.536	6.628	6.712	6.790	6.863	6.930	6.994	7.053	7.110	7.352	7.546	7.708	7.847	7.968	8.075
12	6.209	6.317	6.414	6.503	6.585	6.660	6.731	6.796	6.858	6.916	6.970	7.205	7.394	7.552	7.687	7.804	7.909
13	6.112	6.217	6.312	6.398	6.478	6.551	6.620	6.684	6.744	6.800	6.854	7.083	7.267	7.421	7.552	7.667	7.769
14	6.029	6.132	6.224	6.309	6.387	6.459	6.526	6.588	6.647	6.702	6.754	6.979	7.159	7.309	7.438	7.550	7.650
15	5.958	6.059	6.149	6.233	6.309	6.379	6.445	6.506	6.564	6.618	6.669	6.888	7.065	7.212	7.339	7.449	7.546
16	5.897	5.995	6.084	6.166	6.241	6.310	6.374	6.434	6.491	6.544	6.594	6.810	6.984	7.128	7.252	7.360	7.457
17	5.842	5.940	6.027	6.107	6.181	6.249	6.313	6.372	6.427	6.479	6.529	6.741	6.912	7.054	7.176	7.283	7.377
18	5.794	5.890	5.977	6.055	6.128	6.195	6.258	6.316	6.371	6.422	6.471	6.680	6.848	6.989	7.109	7.213	7.307
19	5.752	5.846	5.932	6.009	6.081	6.147	6.209	6.267	6.321	6.371	6.419	6.626	6.792	6.930	7.048	7.152	7.244
20	5.714	5.807	5.891	5.968	6.039	6.104	6.165	6.222	6.275	6.325	6.373	6.576	6.740	6.877	6.994	7.097	7.187
24	5.594	5.683	5.764	5.838	5.906	5.968	6.027	6.081	6.132	6.181	6.226	6.421	6.579	6.710	6.822	6.920	7.008
30	5.475	5.561	5.638	5.709	5.774	5.833	5.889	5.941	5.990	6.037	6.080	6.267	6.417	6.543	6.650	6.744	6.827
40	5.358	5.439	5.513	5.581	5.642	5.700	5.753	5.803	5.849	5.893	5.934	6.112	6.255	6.375	6.477	6.566	6.645
60	5.241	5.319	5.389	5.453	5.512	5.566	5.617	5.664	5.708	5.750	5.789	5.958	6.093	6.206	6.303	6.387	6.462
120	5.126	5.200	5.266	5.327	5.382	5.434	5.481	5.526	5.568	5.607	5.644	5.802	5.929	6.035	6.126	6.205	6.275
inf	5.012	5.081	5.144	5.201	5.253	5.301	5.346	5.388	5.427	5.463	5.498	5.646	5.764	5.863	5.947	6.020	6.085

Alpha = 0.025

df	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	18	20
1	35.99	54.00	65.69	74.22	80.87	86.29	90.85	94.77	98.20	101.3	104.0	106.5	108.8	110.8	112.7	116.2	119.2
2	8.776	11.94	14.01	15.54	16.75	17.74	18.58	19.31	19.95	20.52	21.03	21.49	21.91	22.30	22.67	23.32	23.89
3	5.907	7.661	8.808	9.660	10.34	10.89	11.37	11.78	12.14	12.46	12.75	13.01	13.26	13.48	13.69	14.06	14.39
4	4.943	6.244	7.088	7.716	8.213	8.625	8.976	9.279	9.548	9.788	10.01	10.20	10.39	10.55	10.71	10.99	11.23
5	4.474	5.558	6.257	6.775	7.186	7.527	7.816	8.068	8.291	8.490	8.670	8.834	8.984	9.124	9.253	9.486	9.693
6	4.199	5.158	5.772	6.226	6.586	6.884	7.138	7.359	7.554	7.729	7.887	8.031	8.163	8.286	8.399	8.605	8.787
7	4.018	4.897	5.455	5.868	6.194	6.464	6.695	6.895	7.072	7.230	7.373	7.504	7.624	7.735	7.839	8.025	8.191
8	3.892	4.714	5.233	5.616	5.919	6.169	6.382	6.568	6.732	6.879	7.011	7.132	7.244	7.347	7.443	7.616	7.769
9	3.797	4.578	5.069	5.430	5.715	5.950	6.151	6.325	6.479	6.617	6.742	6.856	6.961	7.058	7.148	7.311	7.455
10	3.725	4.474	4.943	5.287	5.558	5.782	5.972	6.138	6.285	6.416	6.534	6.643	6.742	6.834	6.920	7.075	7.212
11	3.667	4.391	4.843	5.173	5.433	5.648	5.831	5.989	6.130	6.256	6.369	6.473	6.568	6.657	6.739	6.887	7.019
12	3.620	4.325	4.762	5.081	5.332	5.540	5.716	5.869	6.004	6.125	6.235	6.335	6.427	6.512	6.591	6.734	6.861
13	3.582	4.269	4.694	5.004	5.248	5.449	5.620	5.769	5.900	6.017	6.123	6.220	6.309	6.392	6.468	6.607	6.730
14	3.550	4.222	4.638	4.940	5.178	5.374	5.540	5.684	5.811	5.926	6.029	6.123	6.210	6.290	6.364	6.499	6.619
15	3.522	4.182	4.589	4.885	5.118	5.309	5.471	5.612	5.737	5.848	5.949	6.041	6.125	6.203	6.276	6.407	6.523
16	3.498	4.148	4.548	4.838	5.066	5.253	5.412	5.550	5.672	5.781	5.879	5.969	6.052	6.128	6.199	6.328	6.441
17	3.477	4.118	4.512	4.797	5.020	5.204	5.361	5.496	5.615	5.722	5.818	5.907	5.987	6.062	6.132	6.258	6.370
18	3.458	4.092	4.480	4.761	4.981	5.162	5.315	5.448	5.565	5.670	5.765	5.852	5.931	6.004	6.073	6.197	6.306
19	3.442	4.068	4.451	4.728	4.945	5.123	5.275	5.405	5.521	5.624	5.718	5.803	5.881	5.954	6.020	6.142	6.250
20	3.427	4.047	4.426	4.700	4.914	5.089	5.238	5.368	5.481	5.583	5.675	5.759	5.836	5.907	5.974	6.093	6.200
24	3.381	3.983	4.347	4.610	4.816	4.984	5.216	5.250	5.358	5.455	5.543	5.623	5.697	5.764	5.827	5.941	6.043
30	3.337	3.919	4.271	4.523	4.720	4.881	5.017	5.134	5.238	5.330	5.414	5.490	5.560	5.624	5.684	5.792	5.888
40	3.294	3.858	4.197	4.439	4.627	4.780	4.910	5.022	5.120	5.208	5.288	5.360	5.426	5.487	5.544	5.646	5.737
60	3.251	3.798	4.124	4.356	4.536	4.682	4.806	4.912	5.006	5.089	5.164	5.232	5.295	5.352	5.406	5.503	5.588
120	3.210	3.739	4.053	4.276	4.447	4.587	4.704	4.805	4.894	4.972	5.043	5.107	5.166	5.221	5.271	5.362	5.442
inf	3.170	3.682	3.984	4.197	4.361	4.494	4.605	4.700	4.784	4.858	4.925	4.985	5.041	5.092	5.139	5.224	5.299

df	20	22	24	26	28	30	32	34	36	38	40	50	60	70	80	90	100
1	119.2	121.9	124.3	126.5	128.6	130.4	132.1	133.7	135.2	136.6	137.9	143.6	148.1	151.8	154.9	157.7	160.0
2	23.89	24.41	24.87	25.29	25.67	26.03	26.35	26.66	26.95	27.22	27.47	28.55	29.42	30.13	30.74	31.27	31.74
3	14.39	14.69	14.95	15.19	15.41	15.62	15.81	15.99	16.15	16.31	16.46	17.08	17.59	18.00	18.36	18.67	18.95
4	11.23	11.46	11.66	11.84	12.00	12.16	12.30	12.44	12.56	12.68	12.79	13.27	13.65	13.96	14.23	14.47	14.68
5	9.693	9.878	10.04	10.20	10.34	10.47	10.59	10.70	10.80	10.91	11.00	11.40	11.72	11.99	12.21	12.41	12.59
6	8.787	8.949	9.097	9.231	9.355	9.469	9.575	9.674	9.767	9.855	9.938	10.30	10.58	10.81	11.02	11.19	11.35
7	8.191	8.339	8.473	8.595	8.708	8.812	8.909	8.999	9.084	9.164	9.239	9.563	9.822	10.04	10.23	10.38	10.53
8	7.769	7.907	8.031	8.145	8.250	8.346	8.436	8.520	8.599	8.673	8.743	9.044	9.286	9.487	9.660	9.810	9.944
9	7.455	7.585	7.702	7.809	7.908	7.999	8.084	8.163	8.237	8.307	8.373	8.657	8.885	9.076	9.238	9.381	9.507
10	7.212	7.335	7.447	7.549	7.643	7.729	7.810	7.885	7.956	8.023	8.086	8.356	8.574	8.755	8.911	9.046	9.167
11	7.019	7.137	7.244	7.341	7.431	7.514	7.592	7.664	7.732	7.796	7.856	8.116	8.325	8.499	8.648	8.779	8.894
12	6.861	6.974	7.078	7.172	7.258	7.338	7.413	7.483	7.548	7.610	7.668	7.919	8.120	8.289	8.433	8.559	8.671
13	6.730	6.840	6.939	7.031	7.115	7.192	7.265	7.332	7.396	7.455	7.512	7.755	7.950	8.113	8.253	8.375	8.484
14	6.619	6.726	6.823	6.911	6.993	7.069	7.139	7.204	7.266	7.324	7.379	7.615	7.806	7.965	8.101	8.220	8.325
15	6.523	6.628	6.723	6.809	6.889	6.962	7.031	7.095	7.155	7.212	7.265	7.496	7.682	7.837	7.970	8.086	8.189
16	6.441	6.543	6.636	6.721	6.799	6.870	6.938	7.000	7.059	7.115	7.167	7.393	7.574	7.726	7.856	7.969	8.070
17	6.370	6.469	6.560	6.644	6.720	6.790	6.856	6.917	6.975	7.030	7.081	7.302	7.480	7.628	7.756	7.868	7.966
18	6.306	6.404	6.493	6.575	6.650	6.720	6.784	6.844	6.900	6.954	7.005	7.221	7.396	7.543	7.667	7.777	7.874
19	6.250	6.347	6.434	6.514	6.588	6.656	6.719	6.779	6.835	6.887	6.936	7.150	7.322	7.465	7.589	7.696	7.792
20	6.200	6.295	6.381	6.460	6.532	6.600	6.662	6.720	6.775	6.827	6.876	7.086	7.255	7.397	7.518	7.624	7.718
24	6.043	6.133	6.215	6.290	6.359	6.423	6.482	6.538	6.589	6.639	6.685	6.885	7.046	7.180	7.296	7.397	7.486
30	5.888	5.974	6.052	6.123	6.188	6.248	6.305	6.357	6.406	6.453	6.497	6.686	6.839	6.965	7.075	7.171	7.255
40	5.737	5.818	5.891	5.958	6.020	6.077	6.130	6.179	6.226	6.270	6.311	6.489	6.633	6.753	6.855	6.945	7.025
60	5.588	5.664	5.733	5.797	5.854	5.908	5.958	6.004	6.048	6.089	6.127	6.295	6.429	6.540	6.636	6.720	6.795
120	5.442	5.513	5.578	5.637	5.691	5.741	5.788	5.831	5.872	5.910	5.946	6.101	6.225	6.329	6.418	6.495	6.564
inf	5.299	5.365	5.425	5.480	5.530	5.577	5.620	5.660	5.698	5.733	5.766	5.909	6.023	6.118	6.199	6.270	6.333

Alpha = 0.01