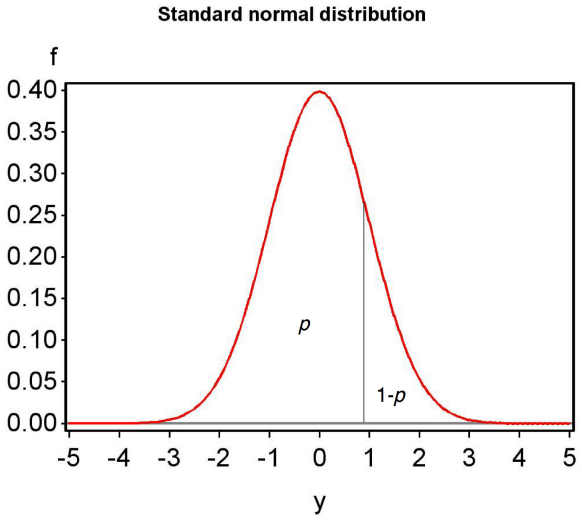
Chapter 23

Statistical Tables

23.1 Table Z: Probabilities for the standard normal distribution.

Suppose a random variable Z has a standard normal distribution ($Z \sim N(0,1)$). This table gives $P[Z < z] = p$ where the first two digits of z are given on the left, while the last digit is given in the top row. The values in the table were generated using the SAS function `probnorm` (SAS Institute Inc. 2016).

Figure 23.1: Plot of the standard normal distribution illustrating the probability shown in the table below.



References

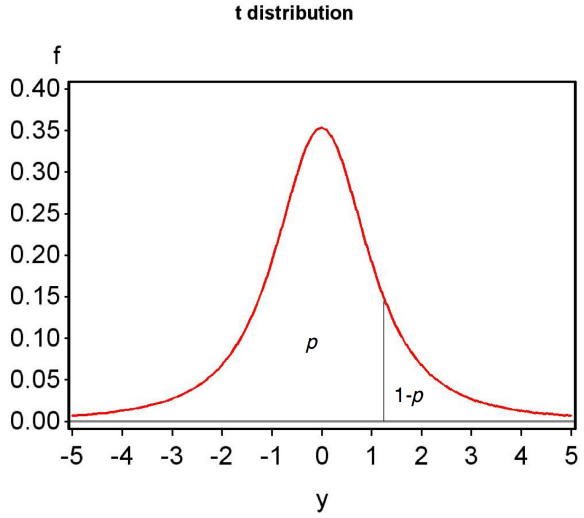
SAS Institute Inc. (2016) *SAS 9.4 Functions and CALL Routines: Reference, Fifth Edition.* SAS Institute Inc., Cary, NC.

z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.5000	0.5040	0.5080	0.5120	0.5160	0.5199	0.5239	0.5279	0.5319	0.5359
0.1	0.5398	0.5438	0.5478	0.5517	0.5557	0.5596	0.5636	0.5675	0.5714	0.5753
0.2	0.5793	0.5832	0.5871	0.5910	0.5948	0.5987	0.6026	0.6064	0.6103	0.6141
0.3	0.6179	0.6217	0.6255	0.6293	0.6331	0.6368	0.6406	0.6443	0.6480	0.6517
0.4	0.6554	0.6591	0.6628	0.6664	0.6700	0.6736	0.6772	0.6808	0.6844	0.6879
0.5	0.6915	0.6950	0.6985	0.7019	0.7054	0.7088	0.7123	0.7157	0.7190	0.7224
0.6	0.7257	0.7291	0.7324	0.7357	0.7389	0.7422	0.7454	0.7486	0.7517	0.7549
0.7	0.7580	0.7611	0.7642	0.7673	0.7704	0.7734	0.7764	0.7794	0.7823	0.7852
0.8	0.7881	0.7910	0.7939	0.7967	0.7995	0.8023	0.8051	0.8078	0.8106	0.8133
0.9	0.8159	0.8186	0.8212	0.8238	0.8264	0.8289	0.8315	0.8340	0.8365	0.8389
1.0	0.8413	0.8438	0.8461	0.8485	0.8508	0.8531	0.8554	0.8577	0.8599	0.8621
1.1	0.8643	0.8665	0.8686	0.8708	0.8729	0.8749	0.8770	0.8790	0.8810	0.8830
1.2	0.8849	0.8869	0.8888	0.8907	0.8925	0.8944	0.8962	0.8980	0.8997	0.9015
1.3	0.9032	0.9049	0.9066	0.9082	0.9099	0.9115	0.9131	0.9147	0.9162	0.9177
1.4	0.9192	0.9207	0.9222	0.9236	0.9251	0.9265	0.9279	0.9292	0.9306	0.9319
1.5	0.9332	0.9345	0.9357	0.9370	0.9382	0.9394	0.9406	0.9418	0.9429	0.9441
1.6	0.9452	0.9463	0.9474	0.9484	0.9495	0.9505	0.9515	0.9525	0.9535	0.9545
1.7	0.9554	0.9564	0.9573	0.9582	0.9591	0.9599	0.9608	0.9616	0.9625	0.9633
1.8	0.9641	0.9649	0.9656	0.9664	0.9671	0.9678	0.9686	0.9693	0.9699	0.9706
1.9	0.9713	0.9719	0.9726	0.9732	0.9738	0.9744	0.9750	0.9756	0.9761	0.9767
2.0	0.9772	0.9778	0.9783	0.9788	0.9793	0.9798	0.9803	0.9808	0.9812	0.9817
2.1	0.9821	0.9826	0.9830	0.9834	0.9838	0.9842	0.9846	0.9850	0.9854	0.9857
2.2	0.9861	0.9864	0.9868	0.9871	0.9875	0.9878	0.9881	0.9884	0.9887	0.9890
2.3	0.9893	0.9896	0.9898	0.9901	0.9904	0.9906	0.9909	0.9911	0.9913	0.9916
2.4	0.9918	0.9920	0.9922	0.9925	0.9927	0.9929	0.9931	0.9932	0.9934	0.9936
2.5	0.9938	0.9940	0.9941	0.9943	0.9945	0.9946	0.9948	0.9949	0.9951	0.9952
2.6	0.9953	0.9955	0.9956	0.9957	0.9959	0.9960	0.9961	0.9962	0.9963	0.9964
2.7	0.9965	0.9966	0.9967	0.9968	0.9969	0.9970	0.9971	0.9972	0.9973	0.9974
2.8	0.9974	0.9975	0.9976	0.9977	0.9977	0.9978	0.9979	0.9979	0.9980	0.9981
2.9	0.9981	0.9982	0.9982	0.9983	0.9984	0.9984	0.9985	0.9985	0.9986	0.9986
3.0	0.9987	0.9987	0.9987	0.9988	0.9988	0.9989	0.9989	0.9989	0.9990	0.9990
3.1	0.9990	0.9991	0.9991	0.9991	0.9992	0.9992	0.9992	0.9992	0.9993	0.9993
3.2	0.9993	0.9993	0.9994	0.9994	0.9994	0.9994	0.9994	0.9995	0.9995	0.9995
3.3	0.9995	0.9995	0.9995	0.9996	0.9996	0.9996	0.9996	0.9996	0.9996	0.9997
3.4	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9998
3.5	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998
3.6	0.9998	0.9998	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999

23.2 Table T: Quantiles of the t distribution

Suppose a random variable T has a t distribution. This table gives values of the quantile q such that $P[T < q] = p$, where $p = 0.75, 0.9, ..., 0.9995$. Degrees of freedom are given on the left. The values in the table were generated using the SAS function `tinv` (SAS Institute Inc. 2016).

Figure 23.2: Plot of the t distribution illustrating p and $1 - p$ in the table below.



References

SAS Institute Inc. (2016) *SAS 9.4 Functions and CALL Routines: Reference, Fifth Edition.* SAS Institute Inc., Cary, NC.

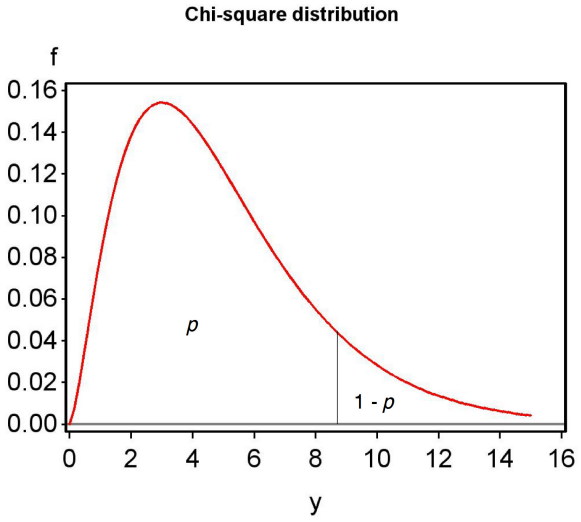
	p	0.75	0.90	0.95	0.975	0.990	0.995	0.9995
	$1-p$	0.25	0.10	0.05	0.025	0.010	0.005	0.0005
	$2(1-p)$	0.50	0.20	0.10	0.050	0.020	0.010	0.0010
	1	1.000	3.078	6.314	12.706	31.821	63.657	636.619
	2	0.816	1.886	2.920	4.303	6.965	9.925	31.599
	3	0.765	1.638	2.353	3.182	4.541	5.841	12.924
	4	0.741	1.533	2.132	2.776	3.747	4.604	8.610
	5	0.727	1.476	2.015	2.571	3.365	4.032	6.869
	6	0.718	1.440	1.943	2.447	3.143	3.707	5.959
	7	0.711	1.415	1.895	2.365	2.998	3.499	5.408
	8	0.706	1.397	1.860	2.306	2.896	3.355	5.041
	9	0.703	1.383	1.833	2.262	2.821	3.250	4.781
	10	0.700	1.372	1.812	2.228	2.764	3.169	4.587
	11	0.697	1.363	1.796	2.201	2.718	3.106	4.437
	12	0.695	1.356	1.782	2.179	2.681	3.055	4.318
	13	0.694	1.350	1.771	2.160	2.650	3.012	4.221
	14	0.692	1.345	1.761	2.145	2.624	2.977	4.140
	15	0.691	1.341	1.753	2.131	2.602	2.947	4.073
	16	0.690	1.337	1.746	2.120	2.583	2.921	4.015
	17	0.689	1.333	1.740	2.110	2.567	2.898	3.965
df	18	0.688	1.330	1.734	2.101	2.552	2.878	3.922
	19	0.688	1.328	1.729	2.093	2.539	2.861	3.883
	20	0.687	1.325	1.725	2.086	2.528	2.845	3.850
	21	0.686	1.323	1.721	2.080	2.518	2.831	3.819
	22	0.686	1.321	1.717	2.074	2.508	2.819	3.792
	23	0.685	1.319	1.714	2.069	2.500	2.807	3.768
	24	0.685	1.318	1.711	2.064	2.492	2.797	3.745
	25	0.684	1.316	1.708	2.060	2.485	2.787	3.725
	26	0.684	1.315	1.706	2.056	2.479	2.779	3.707
	27	0.684	1.314	1.703	2.052	2.473	2.771	3.690
	28	0.683	1.313	1.701	2.048	2.467	2.763	3.674
	29	0.683	1.311	1.699	2.045	2.462	2.756	3.659
	30	0.683	1.310	1.697	2.042	2.457	2.750	3.646
	31	0.682	1.309	1.696	2.040	2.453	2.744	3.633
	32	0.682	1.309	1.694	2.037	2.449	2.738	3.622
	33	0.682	1.308	1.692	2.035	2.445	2.733	3.611
	34	0.682	1.307	1.691	2.032	2.441	2.728	3.601
	35	0.682	1.306	1.690	2.030	2.438	2.724	3.591

	p	0.75	0.90	0.95	0.975	0.990	0.995	0.9995
	$1-p$	0.25	0.10	0.05	0.025	0.010	0.005	0.0005
	$2(1-p)$	0.50	0.20	0.10	0.050	0.020	0.010	0.0010
df	36	0.681	1.306	1.688	2.028	2.434	2.719	3.582
	37	0.681	1.305	1.687	2.026	2.431	2.715	3.574
	38	0.681	1.304	1.686	2.024	2.429	2.712	3.566
	39	0.681	1.304	1.685	2.023	2.426	2.708	3.558
	40	0.681	1.303	1.684	2.021	2.423	2.704	3.551
	50	0.679	1.299	1.676	2.009	2.403	2.678	3.496
	60	0.679	1.296	1.671	2.000	2.390	2.660	3.460
	70	0.678	1.294	1.667	1.994	2.381	2.648	3.435
	80	0.678	1.292	1.664	1.990	2.374	2.639	3.416
	90	0.677	1.291	1.662	1.987	2.368	2.632	3.402
	100	0.677	1.290	1.660	1.984	2.364	2.626	3.390
	∞	0.674	1.282	1.645	1.960	2.326	2.576	3.291

23.3 Table C: Quantiles of the χ^2 distribution

Suppose a random variable X has a χ^2 distribution with df degrees of freedom. This table gives values of the quantile q such that $P[X < q] = p$, where $p = 0.005, ..., 0.999$. The values in the table were generated using the SAS function `cinv` (SAS Institute Inc. 2016).

Figure 23.3: Plot of the χ^2 distribution ($df = 5$) illustrating p and $1 - p$ in the table below.



References

SAS Institute Inc. (2016) *SAS 9.4 Functions and CALL Routines: Reference, Fifth Edition.* SAS Institute Inc., Cary, NC.

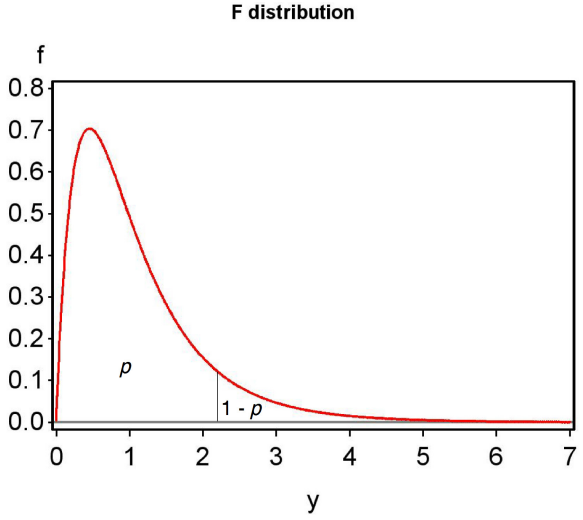
	p	0.005	0.010	0.025	0.050	0.100	0.250	0.500	0.750	0.900	0.950	0.975	0.990	0.995	0.999
	$1-p$	0.995	0.990	0.975	0.950	0.900	0.750	0.500	0.250	0.100	0.050	0.025	0.010	0.005	0.001
df	1	$3.93e^{-5}$	$1.57e^{-4}$	$9.82e^{-4}$	$3.93e^{-3}$	0.016	0.102	0.455	1.323	2.706	3.841	5.024	6.635	7.879	10.828
	2	0.010	0.020	0.051	0.103	0.211	0.575	1.386	2.773	4.605	5.991	7.378	9.210	10.597	13.816
	3	0.072	0.115	0.216	0.352	0.584	1.213	2.366	4.108	6.251	7.815	9.348	11.345	12.838	16.266
	4	0.207	0.297	0.484	0.711	1.064	1.923	3.357	5.385	7.779	9.488	11.143	13.277	14.860	18.467
	5	0.412	0.554	0.831	1.145	1.610	2.675	4.351	6.626	9.236	11.07	12.833	15.086	16.750	20.515
	6	0.676	0.872	1.237	1.635	2.204	3.455	5.348	7.841	10.645	12.592	14.449	16.812	18.548	22.458
	7	0.989	1.239	1.690	2.167	2.833	4.255	6.346	9.037	12.017	14.067	16.013	18.475	20.278	24.322
	8	1.344	1.646	2.180	2.733	3.490	5.071	7.344	10.219	13.362	15.507	17.535	20.09	21.955	26.124
	9	1.735	2.088	2.700	3.325	4.168	5.899	8.343	11.389	14.684	16.919	19.023	21.666	23.589	27.877
	10	2.156	2.558	3.247	3.940	4.865	6.737	9.342	12.549	15.987	18.307	20.483	23.209	25.188	29.588
	11	2.603	3.053	3.816	4.575	5.578	7.584	10.341	13.701	17.275	19.675	21.920	24.725	26.757	31.264
	12	3.074	3.571	4.404	5.226	6.304	8.438	11.34	14.845	18.549	21.026	23.337	26.217	28.300	32.909
	13	3.565	4.107	5.009	5.892	7.042	9.299	12.34	15.984	19.812	22.362	24.736	27.688	29.819	34.528
	14	4.075	4.660	5.629	6.571	7.790	10.165	13.339	17.117	21.064	23.685	26.119	29.141	31.319	36.123
	15	4.601	5.229	6.262	7.261	8.547	11.037	14.339	18.245	22.307	24.996	27.488	30.578	32.801	37.697
	16	5.142	5.812	6.908	7.962	9.312	11.912	15.338	19.369	23.542	26.296	28.845	32.000	34.267	39.252
	17	5.697	6.408	7.564	8.672	10.085	12.792	16.338	20.489	24.769	27.587	30.191	33.409	35.718	40.790
	18	6.265	7.015	8.231	9.390	10.865	13.675	17.338	21.605	25.989	28.869	31.526	34.805	37.156	42.312
	19	6.844	7.633	8.907	10.117	11.651	14.562	18.338	22.718	27.204	30.144	32.852	36.191	38.582	43.820
	20	7.434	8.260	9.591	10.851	12.443	15.452	19.337	23.828	28.412	31.410	34.170	37.566	39.997	45.315
	21	8.034	8.897	10.283	11.591	13.240	16.344	20.337	24.935	29.615	32.671	35.479	38.932	41.401	46.797
	22	8.643	9.542	10.982	12.338	14.041	17.24	21.337	26.039	30.813	33.924	36.781	40.289	42.796	48.268
	23	9.260	10.196	11.689	13.091	14.848	18.137	22.337	27.141	32.007	35.172	38.076	41.638	44.181	49.728
	24	9.886	10.856	12.401	13.848	15.659	19.037	23.337	28.241	33.196	36.415	39.364	42.980	45.559	51.179
	25	10.520	11.524	13.120	14.611	16.473	19.939	24.337	29.339	34.382	37.652	40.646	44.314	46.928	52.620
	26	11.160	12.198	13.844	15.379	17.292	20.843	25.336	30.435	35.563	38.885	41.923	45.642	48.29	54.052
	27	11.808	12.879	14.573	16.151	18.114	21.749	26.336	31.528	36.741	40.113	43.195	46.963	49.645	55.476
	28	12.461	13.565	15.308	16.928	18.939	22.657	27.336	32.620	37.916	41.337	44.461	48.278	50.993	56.892
	29	13.121	14.256	16.047	17.708	19.768	23.567	28.336	33.711	39.087	42.557	45.722	49.588	52.336	58.301
	30	13.787	14.953	16.791	18.493	20.599	24.478	29.336	34.800	40.256	43.773	46.979	50.892	53.672	59.703
	31	14.458	15.655	17.539	19.281	21.434	25.390	30.336	35.887	41.422	44.985	48.232	52.191	55.003	61.098
	32	15.134	16.362	18.291	20.072	22.271	26.304	31.336	36.973	42.585	46.194	49.480	53.486	56.328	62.487
	33	15.815	17.074	19.047	20.867	23.110	27.219	32.336	38.058	43.745	47.400	50.725	54.776	57.648	63.870
	34	16.501	17.789	19.806	21.664	23.952	28.136	33.336	39.141	44.903	48.602	51.966	56.061	58.964	65.247
	35	17.192	18.509	20.569	22.465	24.797	29.054	34.336	40.223	46.059	49.802	53.203	57.342	60.275	66.619
	36	17.887	19.233	21.336	23.269	25.643	29.973	35.336	41.304	47.212	50.998	54.437	58.619	61.581	67.985
	37	18.586	19.960	22.106	24.075	26.492	30.893	36.336	42.383	48.363	52.192	55.668	59.893	62.883	69.346
	38	19.289	20.691	22.878	24.884	27.343	31.815	37.335	43.462	49.513	53.384	56.896	61.162	64.181	70.703
	39	19.996	21.426	23.654	25.695	28.196	32.737	38.335	44.539	50.660	54.572	58.120	62.428	65.476	72.055
	40	20.707	22.164	24.433	26.509	29.051	33.660	39.335	45.616	51.805	55.758	59.342	63.691	66.766	73.402
	41	21.421	22.906	25.215	27.326	29.907	34.585	40.335	46.692	52.949	56.942	60.561	64.950	68.053	74.745
	42	22.138	23.650	25.999	28.144	30.765	35.510	41.335	47.766	54.090	58.124	61.777	66.206	69.336	76.084
	43	22.859	24.398	26.785	28.965	31.625	36.436	42.335	48.840	55.230	59.304	62.990	67.459	70.616	77.419
	44	23.584	25.148	27.575	29.787	32.487	37.363	43.335	49.913	56.369	60.481	64.201	68.710	71.893	78.750
	45	24.311	25.901	28.366	30.612	33.350	38.291	44.335	50.985	57.505	61.656	65.410	69.957	73.166	80.077
	46	25.041	26.657	29.160	31.439	34.215	39.220	45.335	52.056	58.641	62.830	66.617	71.201	74.437	81.400
	47	25.775	27.416	29.956	32.268	35.081	40.149	46.335	53.127	59.774	64.001	67.821	72.443	75.704	82.720
	48	26.511	28.177	30.755	33.098	35.949	41.079	47.335	54.196	60.907	65.171	69.023	73.683	76.969	84.037
	49	27.249	28.941	31.555	33.930	36.818	42.010	48.335	55.265	62.038	66.339	70.222	74.919	78.231	85.351
	50	27.991	29.707	32.357	34.764	37.689	42.942	49.335	56.334	63.167	67.505	71.420	76.154	79.490	86.661

	p	0.005	0.010	0.025	0.050	0.100	0.250	0.500	0.750	0.900	0.950	0.975	0.990	0.995	0.999
	$1-p$	0.995	0.990	0.975	0.950	0.900	0.750	0.500	0.250	0.100	0.050	0.025	0.010	0.005	0.001
	51	28.735	30.475	33.162	35.600	38.56	43.874	50.335	57.401	64.295	68.669	72.616	77.386	80.747	87.968
	52	29.481	31.246	33.968	36.437	39.433	44.808	51.335	58.468	65.422	69.832	73.810	78.616	82.001	89.272
	53	30.230	32.018	34.776	37.276	40.308	45.741	52.335	59.534	66.548	70.993	75.002	79.843	83.253	90.573
	54	30.981	32.793	35.586	38.116	41.183	46.676	53.335	60.600	67.673	72.153	76.192	81.069	84.502	91.872
	55	31.735	33.570	36.398	38.958	42.060	47.610	54.335	61.665	68.796	73.311	77.380	82.292	85.749	93.168
	56	32.490	34.350	37.212	39.801	42.937	48.546	55.335	62.729	69.919	74.468	78.567	83.513	86.994	94.461
	57	33.248	35.131	38.027	40.646	43.816	49.482	56.335	63.793	71.040	75.624	79.752	84.733	88.236	95.751
	58	34.008	35.913	38.844	41.492	44.696	50.419	57.335	64.857	72.160	76.778	80.936	85.950	89.477	97.039
	59	34.770	36.698	39.662	42.339	45.577	51.356	58.335	65.919	73.279	77.931	82.117	87.166	90.715	98.324
	60	35.534	37.485	40.482	43.188	46.459	52.294	59.335	66.981	74.397	79.082	83.298	88.379	91.952	99.607
	61	36.301	38.273	41.303	44.038	47.342	53.232	60.335	68.043	75.514	80.232	84.476	89.591	93.186	100.888
	62	37.068	39.063	42.126	44.889	48.226	54.171	61.335	69.104	76.630	81.381	85.654	90.802	94.419	102.166
	63	37.838	39.855	42.950	45.741	49.111	55.110	62.335	70.165	77.745	82.529	86.830	92.010	95.649	103.442
	64	38.610	40.649	43.776	46.595	49.996	56.050	63.335	71.225	78.860	83.675	88.004	93.217	96.878	104.716
	65	39.383	41.444	44.603	47.450	50.883	56.990	64.335	72.285	79.973	84.821	89.177	94.422	98.105	105.988
	66	40.158	42.240	45.431	48.305	51.770	57.931	65.335	73.344	81.085	85.965	90.349	95.626	99.330	107.258
	67	40.935	43.038	46.261	49.162	52.659	58.872	66.335	74.403	82.197	87.108	91.519	96.828	100.554	108.526
	68	41.713	43.838	47.092	50.020	53.548	59.814	67.335	75.461	83.308	88.250	92.689	98.028	101.776	109.791
	69	42.494	44.639	47.924	50.879	54.438	60.756	68.334	76.519	84.418	89.391	93.856	99.228	102.996	111.055
	70	43.275	45.442	48.758	51.739	55.329	61.698	69.334	77.577	85.527	90.531	95.023	100.425	104.215	112.317
	71	44.058	46.246	49.592	52.600	56.221	62.641	70.334	78.634	86.635	91.670	96.189	101.621	105.432	113.577
	72	44.843	47.051	50.428	53.462	57.113	63.585	71.334	79.690	87.743	92.808	97.353	102.816	106.648	114.835
	73	45.629	47.858	51.265	54.325	58.006	64.528	72.334	80.747	88.850	93.945	98.516	104.010	107.862	116.092
	74	46.417	48.666	52.103	55.189	58.900	65.472	73.334	81.803	89.956	95.081	99.678	105.202	109.074	117.346
	75	47.206	49.475	52.942	56.054	59.795	66.417	74.334	82.858	91.061	96.217	100.839	106.393	110.286	118.599
df	76	47.997	50.286	53.782	56.920	60.690	67.362	75.334	83.913	92.166	97.351	101.999	107.583	111.495	119.850
	77	48.788	51.097	54.623	57.786	61.586	68.307	76.334	84.968	93.270	98.484	103.158	108.771	112.704	121.100
	78	49.582	51.910	55.466	58.654	62.483	69.252	77.334	86.022	94.374	99.617	104.316	109.958	113.911	122.348
	79	50.376	52.725	56.309	59.522	63.380	70.198	78.334	87.077	95.476	100.749	105.473	111.144	115.117	123.594
	80	51.172	53.540	57.153	60.391	64.278	71.145	79.334	88.130	96.578	101.879	106.629	112.329	116.321	124.839
	81	51.969	54.357	57.998	61.261	65.176	72.091	80.334	89.184	97.680	103.010	107.783	113.512	117.524	126.083
	82	52.767	55.174	58.845	62.132	66.076	73.038	81.334	90.237	98.780	104.139	108.937	114.695	118.726	127.324
	83	53.567	55.993	59.692	63.004	66.976	73.985	82.334	91.289	99.880	105.267	110.090	115.876	119.927	128.565
	84	54.368	56.813	60.540	63.876	67.876	74.933	83.334	92.342	100.980	106.395	111.242	117.057	121.126	129.804
	85	55.170	57.634	61.389	64.749	68.777	75.881	84.334	93.394	102.079	107.522	112.393	118.236	122.325	131.041
	86	55.973	58.456	62.239	65.623	69.679	76.829	85.334	94.446	103.177	108.648	113.544	119.414	123.522	132.277
	87	56.777	59.279	63.089	66.498	70.581	77.777	86.334	95.497	104.275	109.773	114.693	120.591	124.718	133.512
	88	57.582	60.103	63.941	67.373	71.484	78.726	87.334	96.548	105.372	110.898	115.841	121.767	125.913	134.745
	89	58.389	60.928	64.793	68.249	72.387	79.675	88.334	97.599	106.469	112.022	116.989	122.942	127.106	135.978
	90	59.196	61.754	65.647	69.126	73.291	80.625	89.334	98.650	107.565	113.145	118.136	124.116	128.299	137.208
	91	60.005	62.581	66.501	70.003	74.196	81.574	90.334	99.700	108.661	114.268	119.282	125.289	129.491	138.438
	92	60.815	63.409	67.356	70.882	75.100	82.524	91.334	100.750	109.756	115.390	120.427	126.462	130.681	139.666
	93	61.625	64.238	68.211	71.760	76.006	83.474	92.334	101.800	110.850	116.511	121.571	127.633	131.871	140.893
	94	62.437	65.068	69.068	72.640	76.912	84.425	93.334	102.850	111.944	117.632	122.715	128.803	133.059	142.119
	95	63.250	65.898	69.925	73.520	77.818	85.376	94.334	103.899	113.038	118.752	123.858	129.973	134.247	143.344
	96	64.063	66.730	70.783	74.401	78.725	86.327	95.334	104.948	114.131	119.871	125.000	131.141	135.433	144.567
	97	64.878	67.562	71.642	75.282	79.633	87.278	96.334	105.997	115.223	120.990	126.141	132.309	136.619	145.789
	98	65.694	68.396	72.501	76.164	80.541	88.229	97.334	107.045	116.315	122.108	127.282	133.476	137.803	147.010
	99	66.510	69.230	73.361	77.046	81.449	89.181	98.334	108.093	117.407	123.225	128.422	134.642	138.987	148.230
	100	67.328	70.065	74.222	77.929	82.358	90.133	99.334	109.141	118.498	124.342	129.561	135.807	140.169	149.449

23.4 Table F: Quantiles of the F distribution

Suppose a random variable Y has an F distribution, with df_1 and df_2 the numerator and denominator degrees of freedom. This table gives values of the quantile q such that $P[Y < q] = p$, where $p = 0.005, ..., 0.999$. The values in the table were generated using the SAS function `finv` (SAS Institute Inc. 2016).

Figure 23.4: Plot of the F distribution ($df_1 = 4$, $df_2 = 20$) illustrating p and $1 - p$ in the table below.



References

SAS Institute Inc. (2016) *SAS 9.4 Functions and CALL Routines: Reference, Fifth Edition.* SAS Institute Inc., Cary, NC.

		0.900	0.950	0.975	0.990	0.995	0.999	p
		0.100	0.050	0.025	0.010	0.005	0.001	$1-p$
df_1	df_2							
1	4	4.545	7.709	12.218	21.198	31.333	74.137	
2	4	4.325	6.944	10.649	18.000	26.284	61.246	
3	4	4.191	6.591	9.979	16.694	24.259	56.177	
4	4	4.107	6.388	9.605	15.977	23.155	53.436	
5	4	4.051	6.256	9.364	15.522	22.456	51.712	
6	4	4.010	6.163	9.197	15.207	21.975	50.525	
1	5	4.060	6.608	10.007	16.258	22.785	47.181	
2	5	3.780	5.786	8.434	13.274	18.314	37.122	
3	5	3.619	5.409	7.764	12.060	16.530	33.202	
4	5	3.520	5.192	7.388	11.392	15.556	31.085	
5	5	3.453	5.050	7.146	10.967	14.940	29.752	
6	5	3.405	4.950	6.978	10.672	14.513	28.834	
1	6	3.776	5.987	8.813	13.745	18.635	35.507	
2	6	3.463	5.143	7.260	10.925	14.544	27.000	
3	6	3.289	4.757	6.599	9.780	12.917	23.703	
4	6	3.181	4.534	6.227	9.148	12.028	21.924	
5	6	3.108	4.387	5.988	8.746	11.464	20.803	
6	6	3.055	4.284	5.820	8.466	11.073	20.030	
1	7	3.589	5.591	8.073	12.246	16.236	29.245	
2	7	3.257	4.737	6.542	9.547	12.404	21.689	
3	7	3.074	4.347	5.890	8.451	10.882	18.772	
4	7	2.961	4.120	5.523	7.847	10.050	17.198	
5	7	2.883	3.972	5.285	7.460	9.522	16.206	
6	7	2.827	3.866	5.119	7.191	9.155	15.521	
1	8	3.458	5.318	7.571	11.259	14.688	25.415	
2	8	3.113	4.459	6.059	8.649	11.042	18.494	
3	8	2.924	4.066	5.416	7.591	9.596	15.829	
4	8	2.806	3.838	5.053	7.006	8.805	14.392	
5	8	2.726	3.687	4.817	6.632	8.302	13.485	
6	8	2.668	3.581	4.652	6.371	7.952	12.858	
1	9	3.360	5.117	7.209	10.561	13.614	22.857	
2	9	3.006	4.256	5.715	8.022	10.107	16.387	
3	9	2.813	3.863	5.078	6.992	8.717	13.902	
4	9	2.693	3.633	4.718	6.422	7.956	12.560	
5	9	2.611	3.482	4.484	6.057	7.471	11.714	
6	9	2.551	3.374	4.320	5.802	7.134	11.128	
1	10	3.285	4.965	6.937	10.044	12.826	21.040	
2	10	2.924	4.103	5.456	7.559	9.427	14.905	
3	10	2.728	3.708	4.826	6.552	8.081	12.553	
4	10	2.605	3.478	4.468	5.994	7.343	11.283	
5	10	2.522	3.326	4.236	5.636	6.872	10.481	
6	10	2.461	3.217	4.072	5.386	6.545	9.926	

		0.900	0.950	0.975	0.990	0.995	0.999	p
		0.100	0.050	0.025	0.010	0.005	0.001	$1-p$
df_1	df_2							
1	11	3.225	4.844	6.724	9.646	12.226	19.687	
2	11	2.860	3.982	5.256	7.206	8.912	13.812	
3	11	2.660	3.587	4.630	6.217	7.600	11.561	
4	11	2.536	3.357	4.275	5.668	6.881	10.346	
5	11	2.451	3.204	4.044	5.316	6.422	9.578	
6	11	2.389	3.095	3.881	5.069	6.102	9.047	
1	12	3.177	4.747	6.554	9.330	11.754	18.643	
2	12	2.807	3.885	5.096	6.927	8.510	12.974	
3	12	2.606	3.490	4.474	5.953	7.226	10.804	
4	12	2.480	3.259	4.121	5.412	6.521	9.633	
5	12	2.394	3.106	3.891	5.064	6.071	8.892	
6	12	2.331	2.996	3.728	4.821	5.757	8.379	
1	13	3.136	4.667	6.414	9.074	11.374	17.815	
2	13	2.763	3.806	4.965	6.701	8.186	12.313	
3	13	2.560	3.411	4.347	5.739	6.926	10.209	
4	13	2.434	3.179	3.996	5.205	6.233	9.073	
5	13	2.347	3.025	3.767	4.862	5.791	8.354	
6	13	2.283	2.915	3.604	4.620	5.482	7.856	
1	14	3.102	4.600	6.298	8.862	11.060	17.143	
2	14	2.726	3.739	4.857	6.515	7.922	11.779	
3	14	2.522	3.344	4.242	5.564	6.680	9.729	
4	14	2.395	3.112	3.892	5.035	5.998	8.622	
5	14	2.307	2.958	3.663	4.695	5.562	7.922	
6	14	2.243	2.848	3.501	4.456	5.257	7.436	
1	15	3.073	4.543	6.200	8.683	10.798	16.587	
2	15	2.695	3.682	4.765	6.359	7.701	11.339	
3	15	2.490	3.287	4.153	5.417	6.476	9.335	
4	15	2.361	3.056	3.804	4.893	5.803	8.253	
5	15	2.273	2.901	3.576	4.556	5.372	7.567	
6	15	2.208	2.790	3.415	4.318	5.071	7.092	
1	16	3.048	4.494	6.115	8.531	10.575	16.120	
2	16	2.668	3.634	4.687	6.226	7.514	10.971	
3	16	2.462	3.239	4.077	5.292	6.303	9.006	
4	16	2.333	3.007	3.729	4.773	5.638	7.944	
5	16	2.244	2.852	3.502	4.437	5.212	7.272	
6	16	2.178	2.741	3.341	4.202	4.913	6.805	
1	17	3.026	4.451	6.042	8.400	10.384	15.722	
2	17	2.645	3.592	4.619	6.112	7.354	10.658	
3	17	2.437	3.197	4.011	5.185	6.156	8.727	
4	17	2.308	2.965	3.665	4.669	5.497	7.683	
5	17	2.218	2.810	3.438	4.336	5.075	7.022	
6	17	2.152	2.699	3.277	4.102	4.779	6.562	

		0.900	0.950	0.975	0.990	0.995	0.999	p
		0.100	0.050	0.025	0.010	0.005	0.001	$1-p$
df_1	df_2							
1	18	3.007	4.414	5.978	8.285	10.218	15.379	
2	18	2.624	3.555	4.560	6.013	7.215	10.390	
3	18	2.416	3.160	3.954	5.092	6.028	8.487	
4	18	2.286	2.928	3.608	4.579	5.375	7.459	
5	18	2.196	2.773	3.382	4.248	4.956	6.808	
6	18	2.130	2.661	3.221	4.015	4.663	6.355	
1	19	2.990	4.381	5.922	8.185	10.073	15.081	
2	19	2.606	3.522	4.508	5.926	7.093	10.157	
3	19	2.397	3.127	3.903	5.010	5.916	8.280	
4	19	2.266	2.895	3.559	4.500	5.268	7.265	
5	19	2.176	2.740	3.333	4.171	4.853	6.622	
6	19	2.109	2.628	3.172	3.939	4.561	6.175	
1	20	2.975	4.351	5.871	8.096	9.944	14.819	
2	20	2.589	3.493	4.461	5.849	6.986	9.953	
3	20	2.380	3.098	3.859	4.938	5.818	8.098	
4	20	2.249	2.866	3.515	4.431	5.174	7.096	
5	20	2.158	2.711	3.289	4.103	4.762	6.461	
6	20	2.091	2.599	3.128	3.871	4.472	6.019	
1	21	2.961	4.325	5.827	8.017	9.830	14.587	
2	21	2.575	3.467	4.420	5.780	6.891	9.772	
3	21	2.365	3.072	3.819	4.874	5.730	7.938	
4	21	2.233	2.840	3.475	4.369	5.091	6.947	
5	21	2.142	2.685	3.250	4.042	4.681	6.318	
6	21	2.075	2.573	3.090	3.812	4.393	5.881	
1	22	2.949	4.301	5.786	7.945	9.727	14.380	
2	22	2.561	3.443	4.383	5.719	6.806	9.612	
3	22	2.351	3.049	3.783	4.817	5.652	7.796	
4	22	2.219	2.817	3.440	4.313	5.017	6.814	
5	22	2.128	2.661	3.215	3.988	4.609	6.191	
6	22	2.060	2.549	3.055	3.758	4.322	5.758	
1	23	2.937	4.279	5.750	7.881	9.635	14.195	
2	23	2.549	3.422	4.349	5.664	6.730	9.469	
3	23	2.339	3.028	3.750	4.765	5.582	7.669	
4	23	2.207	2.796	3.408	4.264	4.950	6.696	
5	23	2.115	2.640	3.183	3.939	4.544	6.078	
6	23	2.047	2.528	3.023	3.710	4.259	5.649	
1	24	2.927	4.260	5.717	7.823	9.551	14.028	
2	24	2.538	3.403	4.319	5.614	6.661	9.339	
3	24	2.327	3.009	3.721	4.718	5.519	7.554	
4	24	2.195	2.776	3.379	4.218	4.890	6.589	
5	24	2.103	2.621	3.155	3.895	4.486	5.977	
6	24	2.035	2.508	2.995	3.667	4.202	5.550	

		0.900	0.950	0.975	0.990	0.995	0.999	p
		0.100	0.050	0.025	0.010	0.005	0.001	$1-p$
df_1	df_2							
1	25	2.918	4.242	5.686	7.770	9.475	13.877	
2	25	2.528	3.385	4.291	5.568	6.598	9.223	
3	25	2.317	2.991	3.694	4.675	5.462	7.451	
4	25	2.184	2.759	3.353	4.177	4.835	6.493	
5	25	2.092	2.603	3.129	3.855	4.433	5.885	
6	25	2.024	2.490	2.969	3.627	4.150	5.462	
1	26	2.909	4.225	5.659	7.721	9.406	13.739	
2	26	2.519	3.369	4.265	5.526	6.541	9.116	
3	26	2.307	2.975	3.670	4.637	5.409	7.357	
4	26	2.174	2.743	3.329	4.140	4.785	6.406	
5	26	2.082	2.587	3.105	3.818	4.384	5.802	
6	26	2.014	2.474	2.945	3.591	4.103	5.381	
1	27	2.901	4.210	5.633	7.677	9.342	13.613	
2	27	2.511	3.354	4.242	5.488	6.489	9.019	
3	27	2.299	2.960	3.647	4.601	5.361	7.272	
4	27	2.165	2.728	3.307	4.106	4.740	6.326	
5	27	2.073	2.572	3.083	3.785	4.340	5.726	
6	27	2.005	2.459	2.923	3.558	4.059	5.308	
1	28	2.894	4.196	5.610	7.636	9.284	13.498	
2	28	2.503	3.340	4.221	5.453	6.440	8.931	
3	28	2.291	2.947	3.626	4.568	5.317	7.193	
4	28	2.157	2.714	3.286	4.074	4.698	6.253	
5	28	2.064	2.558	3.063	3.754	4.300	5.656	
6	28	1.996	2.445	2.903	3.528	4.020	5.241	
1	29	2.887	4.183	5.588	7.598	9.230	13.391	
2	29	2.495	3.328	4.201	5.420	6.396	8.849	
3	29	2.283	2.934	3.607	4.538	5.276	7.121	
4	29	2.149	2.701	3.267	4.045	4.659	6.186	
5	29	2.057	2.545	3.044	3.725	4.262	5.593	
6	29	1.988	2.432	2.884	3.499	3.983	5.179	
1	30	2.881	4.171	5.568	7.562	9.180	13.293	
2	30	2.489	3.316	4.182	5.390	6.355	8.773	
3	30	2.276	2.922	3.589	4.510	5.239	7.054	
4	30	2.142	2.690	3.250	4.018	4.623	6.125	
5	30	2.049	2.534	3.026	3.699	4.228	5.534	
6	30	1.980	2.421	2.867	3.473	3.949	5.122	
1	31	2.875	4.160	5.549	7.530	9.133	13.202	
2	31	2.482	3.305	4.165	5.362	6.317	8.704	
3	31	2.270	2.911	3.573	4.484	5.204	6.993	
4	31	2.136	2.679	3.234	3.993	4.590	6.067	
5	31	2.042	2.523	3.010	3.675	4.196	5.480	
6	31	1.973	2.409	2.851	3.449	3.918	5.070	

		0.900	0.950	0.975	0.990	0.995	0.999	p
		0.100	0.050	0.025	0.010	0.005	0.001	$1-p$
df_1	df_2							
1	32	2.869	4.149	5.531	7.499	9.090	13.117	
2	32	2.477	3.295	4.149	5.336	6.281	8.639	
3	32	2.263	2.901	3.557	4.459	5.171	6.936	
4	32	2.129	2.668	3.218	3.969	4.559	6.014	
5	32	2.036	2.512	2.995	3.652	4.166	5.429	
6	32	1.967	2.399	2.836	3.427	3.889	5.021	
1	33	2.864	4.139	5.515	7.471	9.050	13.039	
2	33	2.471	3.285	4.134	5.312	6.248	8.579	
3	33	2.258	2.892	3.543	4.437	5.141	6.883	
4	33	2.123	2.659	3.204	3.948	4.531	5.965	
5	33	2.030	2.503	2.981	3.630	4.138	5.382	
6	33	1.961	2.389	2.822	3.406	3.861	4.976	
1	34	2.859	4.130	5.499	7.444	9.012	12.965	
2	34	2.466	3.276	4.120	5.289	6.217	8.522	
3	34	2.252	2.883	3.529	4.416	5.113	6.833	
4	34	2.118	2.650	3.191	3.927	4.504	5.919	
5	34	2.024	2.494	2.968	3.611	4.112	5.339	
6	34	1.955	2.380	2.808	3.386	3.836	4.934	
1	35	2.855	4.121	5.485	7.419	8.976	12.896	
2	35	2.461	3.267	4.106	5.268	6.188	8.470	
3	35	2.247	2.874	3.517	4.396	5.086	6.787	
4	35	2.113	2.641	3.179	3.908	4.479	5.876	
5	35	2.019	2.485	2.956	3.592	4.088	5.298	
6	35	1.950	2.372	2.796	3.368	3.812	4.894	
1	36	2.850	4.113	5.471	7.396	8.943	12.832	
2	36	2.456	3.259	4.094	5.248	6.161	8.420	
3	36	2.243	2.866	3.505	4.377	5.062	6.744	
4	36	2.108	2.634	3.167	3.890	4.455	5.836	
5	36	2.014	2.477	2.944	3.574	4.065	5.260	
6	36	1.945	2.364	2.785	3.351	3.790	4.857	
1	37	2.846	4.105	5.458	7.373	8.912	12.771	
2	37	2.452	3.252	4.082	5.229	6.135	8.374	
3	37	2.238	2.859	3.493	4.360	5.038	6.703	
4	37	2.103	2.626	3.156	3.873	4.433	5.799	
5	37	2.009	2.470	2.933	3.558	4.043	5.224	
6	37	1.940	2.356	2.774	3.334	3.769	4.823	
1	38	2.842	4.098	5.446	7.353	8.882	12.714	
2	38	2.448	3.245	4.071	5.211	6.111	8.331	
3	38	2.234	2.852	3.483	4.343	5.016	6.665	
4	38	2.099	2.619	3.145	3.858	4.412	5.763	
5	38	2.005	2.463	2.923	3.542	4.023	5.190	
6	38	1.935	2.349	2.763	3.319	3.749	4.790	

		0.900	0.950	0.975	0.990	0.995	0.999	p
		0.100	0.050	0.025	0.010	0.005	0.001	$1-p$
df_1	df_2							
1	39	2.839	4.091	5.435	7.333	8.854	12.660	
2	39	2.444	3.238	4.061	5.194	6.088	8.290	
3	39	2.230	2.845	3.473	4.327	4.995	6.629	
4	39	2.095	2.612	3.135	3.843	4.392	5.730	
5	39	2.001	2.456	2.913	3.528	4.004	5.158	
6	39	1.931	2.342	2.754	3.305	3.731	4.759	
1	40	2.835	4.085	5.424	7.314	8.828	12.609	
2	40	2.440	3.232	4.051	5.179	6.066	8.251	
3	40	2.226	2.839	3.463	4.313	4.976	6.595	
4	40	2.091	2.606	3.126	3.828	4.374	5.698	
5	40	1.997	2.449	2.904	3.514	3.986	5.128	
6	40	1.927	2.336	2.744	3.291	3.713	4.731	
1	41	2.832	4.079	5.414	7.296	8.803	12.561	
2	41	2.437	3.226	4.042	5.163	6.046	8.214	
3	41	2.222	2.833	3.454	4.299	4.957	6.562	
4	41	2.087	2.600	3.117	3.815	4.356	5.668	
5	41	1.993	2.443	2.895	3.501	3.969	5.100	
6	41	1.923	2.330	2.736	3.278	3.696	4.703	
1	42	2.829	4.073	5.404	7.280	8.779	12.516	
2	42	2.434	3.220	4.033	5.149	6.027	8.179	
3	42	2.219	2.827	3.446	4.285	4.940	6.532	
4	42	2.084	2.594	3.109	3.802	4.339	5.640	
5	42	1.989	2.438	2.887	3.488	3.953	5.073	
6	42	1.919	2.324	2.727	3.266	3.680	4.677	
1	43	2.826	4.067	5.395	7.264	8.757	12.472	
2	43	2.430	3.214	4.024	5.136	6.008	8.146	
3	43	2.216	2.822	3.438	4.273	4.923	6.503	
4	43	2.080	2.589	3.101	3.790	4.324	5.613	
5	43	1.986	2.432	2.879	3.476	3.937	5.048	
6	43	1.916	2.318	2.719	3.254	3.665	4.653	
1	44	2.823	4.062	5.386	7.248	8.735	12.431	
2	44	2.427	3.209	4.016	5.123	5.991	8.115	
3	44	2.213	2.816	3.430	4.261	4.907	6.476	
4	44	2.077	2.584	3.093	3.778	4.308	5.588	
5	44	1.983	2.427	2.871	3.465	3.923	5.024	
6	44	1.913	2.313	2.712	3.243	3.651	4.630	
1	45	2.820	4.057	5.377	7.234	8.715	12.392	
2	45	2.425	3.204	4.009	5.110	5.974	8.086	
3	45	2.210	2.812	3.422	4.249	4.892	6.450	
4	45	2.074	2.579	3.086	3.767	4.294	5.564	
5	45	1.980	2.422	2.864	3.454	3.909	5.001	
6	45	1.909	2.308	2.705	3.232	3.638	4.608	

		0.900	0.950	0.975	0.990	0.995	0.999	p
		0.100	0.050	0.025	0.010	0.005	0.001	$1-p$
df_1	df_2							
1	46	2.818	4.052	5.369	7.220	8.695	12.355	
2	46	2.422	3.200	4.001	5.099	5.958	8.057	
3	46	2.207	2.807	3.415	4.238	4.877	6.425	
4	46	2.071	2.574	3.079	3.757	4.280	5.541	
5	46	1.977	2.417	2.857	3.444	3.896	4.979	
6	46	1.906	2.304	2.698	3.222	3.625	4.587	
1	47	2.815	4.047	5.361	7.207	8.677	12.319	
2	47	2.419	3.195	3.994	5.087	5.943	8.030	
3	47	2.204	2.802	3.409	4.228	4.864	6.401	
4	47	2.068	2.570	3.073	3.747	4.267	5.519	
5	47	1.974	2.413	2.851	3.434	3.883	4.958	
6	47	1.903	2.299	2.691	3.213	3.612	4.566	
1	48	2.813	4.043	5.354	7.194	8.659	12.286	
2	48	2.417	3.191	3.987	5.077	5.929	8.005	
3	48	2.202	2.798	3.402	4.218	4.850	6.379	
4	48	2.066	2.565	3.066	3.737	4.255	5.498	
5	48	1.971	2.409	2.844	3.425	3.871	4.938	
6	48	1.901	2.295	2.685	3.204	3.601	4.547	
1	49	2.811	4.038	5.347	7.182	8.642	12.253	
2	49	2.414	3.187	3.981	5.066	5.915	7.980	
3	49	2.199	2.794	3.396	4.208	4.838	6.357	
4	49	2.063	2.561	3.060	3.728	4.243	5.478	
5	49	1.968	2.404	2.838	3.416	3.860	4.919	
6	49	1.898	2.290	2.679	3.195	3.589	4.529	
1	50	2.809	4.034	5.340	7.171	8.626	12.222	
2	50	2.412	3.183	3.975	5.057	5.902	7.956	
3	50	2.197	2.790	3.390	4.199	4.826	6.336	
4	50	2.061	2.557	3.054	3.720	4.232	5.459	
5	50	1.966	2.400	2.833	3.408	3.849	4.901	
6	50	1.895	2.286	2.674	3.186	3.579	4.512	
1	51	2.807	4.030	5.334	7.159	8.610	12.192	
2	51	2.410	3.179	3.969	5.047	5.889	7.934	
3	51	2.194	2.786	3.385	4.191	4.814	6.317	
4	51	2.058	2.553	3.049	3.711	4.221	5.441	
5	51	1.964	2.397	2.827	3.400	3.838	4.884	
6	51	1.893	2.283	2.668	3.178	3.568	4.495	
1	52	2.805	4.027	5.328	7.149	8.595	12.164	
2	52	2.408	3.175	3.963	5.038	5.877	7.912	
3	52	2.192	2.783	3.379	4.182	4.803	6.298	
4	52	2.056	2.550	3.044	3.703	4.210	5.424	
5	52	1.961	2.393	2.822	3.392	3.828	4.867	
6	52	1.891	2.279	2.663	3.171	3.558	4.479	

		0.900	0.950	0.975	0.990	0.995	0.999	p
		0.100	0.050	0.025	0.010	0.005	0.001	$1-p$
df_1	df_2							
1	53	2.803	4.023	5.322	7.139	8.581	12.137	
2	53	2.406	3.172	3.958	5.030	5.865	7.892	
3	53	2.190	2.779	3.374	4.174	4.793	6.280	
4	53	2.054	2.546	3.038	3.695	4.200	5.407	
5	53	1.959	2.389	2.817	3.384	3.818	4.852	
6	53	1.888	2.275	2.658	3.163	3.549	4.464	
1	54	2.801	4.020	5.316	7.129	8.567	12.111	
2	54	2.404	3.168	3.953	5.021	5.854	7.872	
3	54	2.188	2.776	3.369	4.167	4.783	6.262	
4	54	2.052	2.543	3.034	3.688	4.191	5.391	
5	54	1.957	2.386	2.812	3.377	3.809	4.836	
6	54	1.886	2.272	2.653	3.156	3.540	4.449	
1	55	2.799	4.016	5.310	7.119	8.554	12.085	
2	55	2.402	3.165	3.948	5.013	5.843	7.853	
3	55	2.186	2.773	3.364	4.159	4.773	6.246	
4	55	2.050	2.540	3.029	3.681	4.181	5.375	
5	55	1.955	2.383	2.807	3.370	3.800	4.822	
6	55	1.884	2.269	2.648	3.149	3.531	4.435	
1	56	2.797	4.013	5.305	7.110	8.541	12.061	
2	56	2.400	3.162	3.943	5.006	5.833	7.834	
3	56	2.184	2.769	3.359	4.152	4.763	6.230	
4	56	2.048	2.537	3.024	3.674	4.172	5.361	
5	56	1.953	2.380	2.803	3.363	3.791	4.808	
6	56	1.882	2.266	2.644	3.143	3.523	4.421	
1	57	2.796	4.010	5.300	7.102	8.529	12.038	
2	57	2.398	3.159	3.938	4.998	5.823	7.817	
3	57	2.182	2.766	3.355	4.145	4.754	6.214	
4	57	2.046	2.534	3.020	3.667	4.164	5.346	
5	57	1.951	2.377	2.798	3.357	3.783	4.794	
6	57	1.880	2.263	2.639	3.136	3.514	4.408	
1	58	2.794	4.007	5.295	7.093	8.517	12.015	
2	58	2.396	3.156	3.934	4.991	5.813	7.800	
3	58	2.181	2.764	3.351	4.138	4.746	6.199	
4	58	2.044	2.531	3.016	3.661	4.156	5.333	
5	58	1.949	2.374	2.794	3.351	3.775	4.781	
6	58	1.878	2.260	2.635	3.130	3.507	4.396	
1	59	2.793	4.004	5.290	7.085	8.506	11.994	
2	59	2.395	3.153	3.929	4.984	5.804	7.784	
3	59	2.179	2.761	3.347	4.132	4.737	6.185	
4	59	2.043	2.528	3.012	3.655	4.148	5.319	
5	59	1.947	2.371	2.790	3.345	3.767	4.769	
6	59	1.876	2.257	2.631	3.124	3.499	4.384	

		0.900	0.950	0.975	0.990	0.995	0.999	p
		0.100	0.050	0.025	0.010	0.005	0.001	$1-p$
df_1	df_2							
1	60	2.791	4.001	5.286	7.077	8.495	11.973	
2	60	2.393	3.150	3.925	4.977	5.795	7.768	
3	60	2.177	2.758	3.343	4.126	4.729	6.171	
4	60	2.041	2.525	3.008	3.649	4.140	5.307	
5	60	1.946	2.368	2.786	3.339	3.760	4.757	
6	60	1.875	2.254	2.627	3.119	3.492	4.372	