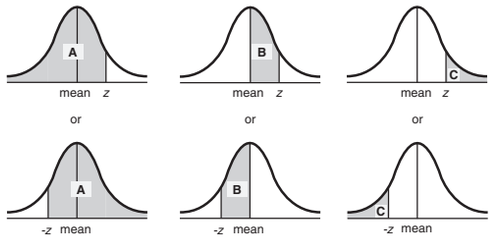
APPENDIX A

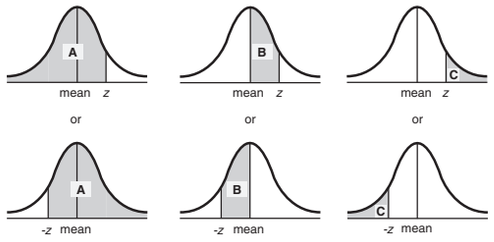
Statistical Tables

Table 1: *z* Scores

Area under the normal curve



Area under the normal curve



z score	A Below +z Above −z	B From mean to z or to −z	C Above +z Below −z	z score	A Below +z Above −z	B From mean to z or to −z	C Above +z Below −z
0.00	50.00%	0.00%	50.00%	0.25	59.87%	9.87%	40.13%
0.01	50.40%	0.40%	49.60%	0.26	60.26%	10.26%	39.74%
0.02	50.80%	0.80%	49.20%	0.27	60.64%	10.64%	39.36%
0.03	51.20%	1.20%	48.80%	0.28	61.03%	11.03%	38.97%
0.04	51.60%	1.60%	48.40%	0.29	61.41%	11.41%	38.59%
0.05	51.99%	1.99%	48.01%	0.30	61.79%	11.79%	38.21%
0.06	52.39%	2.39%	47.61%	0.31	62.17%	12.17%	37.83%
0.07	52.79%	2.79%	47.21%	0.32	62.55%	12.55%	37.45%
0.08	53.19%	3.19%	46.81%	0.33	62.93%	12.93%	37.07%
0.09	53.59%	3.59%	46.41%	0.34	63.31%	13.31%	36.69%
0.10	53.98%	3.98%	46.02%	0.35	63.68%	13.68%	36.32%
0.11	54.38%	4.38%	45.62%	0.36	64.06%	14.06%	35.94%
0.12	54.78%	4.78%	45.22%	0.37	64.43%	14.43%	35.57%
0.13	55.17%	5.17%	44.83%	0.38	64.80%	14.80%	35.20%
0.14	55.57%	5.57%	44.43%	0.39	65.17%	15.17%	34.83%
0.15	55.96%	5.96%	44.04%	0.40	65.54%	15.54%	34.46%
0.16	56.36%	6.36%	43.64%	0.41	65.91%	15.91%	34.09%
0.17	56.75%	6.75%	43.25%	0.42	66.28%	16.28%	33.72%
0.18	57.14%	7.14%	42.86%	0.43	66.64%	16.64%	33.36%
0.19	57.53%	7.53%	42.47%	0.44	67.00%	17.00%	33.00%
0.20	57.93%	7.93%	42.07%	0.45	67.36%	17.36%	32.64%
0.21	58.32%	8.32%	41.68%	0.46	67.72%	17.72%	32.28%
0.22	58.71%	8.71%	41.29%	0.47	68.08%	18.08%	31.92%
0.23	59.10%	9.10%	40.90%	0.48	68.44%	18.44%	31.56%
0.24	59.48%	9.48%	40.52%	0.49	68.79%	18.79%	31.21%

Table 1: *z* Scores (continued)

z score	A Below +*z* Above −*z*	B From mean to *z* or to −*z*	C Above +*z* Below −*z*	*z* score	A Below +*z* Above −*z*	B From mean to *z* or to −*z*	C Above +*z* Below −*z*
0.50	69.15%	19.15%	30.85%	0.87	80.78%	30.78%	19.22%
0.51	69.50%	19.50%	30.50%	0.88	81.06%	31.06%	18.94%
0.52	69.85%	19.85%	30.15%	0.89	81.33%	31.33%	18.67%
0.53	70.19%	20.19%	29.81%	0.90	81.59%	31.59%	18.41%
0.54	70.54%	20.54%	29.46%	0.91	81.86%	31.86%	18.14%
0.55	70.88%	20.88%	29.12%	0.92	82.12%	32.12%	17.88%
0.56	71.23%	21.23%	28.77%	0.93	82.38%	32.38%	17.62%
0.57	71.57%	21.57%	28.43%	0.94	82.64%	32.64%	17.36%
0.58	71.90%	21.90%	28.10%	0.95	82.89%	32.89%	17.11%
0.59	72.24%	22.24%	27.76%	0.96	83.15%	33.15%	16.85%
0.60	72.57%	22.57%	27.43%	0.97	83.40%	33.40%	16.60%
0.61	72.91%	22.91%	27.09%	0.98	83.65%	33.65%	16.35%
0.62	73.24%	23.24%	26.76%	0.99	83.89%	33.89%	16.11%
0.63	73.57%	23.57%	26.43%	1.00	84.13%	34.13%	15.87%
0.64	73.89%	23.89%	26.11%	1.01	84.38%	34.38%	15.62%
0.65	74.22%	24.22%	25.78%	1.02	84.61%	34.61%	15.39%
0.66	74.54%	24.54%	25.46%	1.03	84.85%	34.85%	15.15%
0.67	74.86%	24.86%	25.14%	1.04	85.08%	35.08%	14.92%
0.68	75.17%	25.17%	24.83%	1.05	85.31%	35.31%	14.69%
0.69	75.49%	25.49%	24.51%	1.06	85.54%	35.54%	14.46%
0.70	75.80%	25.80%	24.20%	1.07	85.77%	35.77%	14.23%
0.71	76.11%	26.11%	23.89%	1.08	85.99%	35.99%	14.01%
0.72	76.42%	26.42%	23.58%	1.09	86.21%	36.21%	13.79%
0.73	76.73%	26.73%	23.27%	1.10	86.43%	36.43%	13.57%
0.74	77.04%	27.04%	22.96%	1.11	86.65%	36.65%	13.35%
0.75	77.34%	27.34%	22.66%	1.12	86.86%	36.86%	13.14%
0.76	77.64%	27.64%	22.36%	1.13	87.08%	37.08%	12.92%
0.77	77.94%	27.94%	22.06%	1.14	87.29%	37.29%	12.71%
0.78	78.23%	28.23%	21.77%	1.15	87.49%	37.49%	12.51%
0.79	78.52%	28.52%	21.48%	1.16	87.70%	37.70%	12.30%
0.80	78.81%	28.81%	21.19%	1.17	87.90%	37.90%	12.10%
0.81	79.10%	29.10%	20.90%	1.18	88.10%	38.10%	11.90%
0.82	79.39%	29.39%	20.61%	1.19	88.30%	38.30%	11.70%
0.83	79.67%	29.67%	20.33%	1.20	88.49%	38.49%	11.51%
0.84	79.95%	29.95%	20.05%	1.21	88.69%	38.69%	11.31%
0.85	80.23%	30.23%	19.77%	1.22	88.88%	38.88%	11.12%
0.86	80.51%	30.51%	19.49%	1.23	89.07%	39.07%	10.93%

z score	A Below +z Above −z	B From mean to z or to −z	C Above +z Below −z	z score	A Below +z Above −z	B From mean to z or to −z	C Above +z Below −z
1.24	89.25%	39.25%	10.75%	1.61	94.63%	44.63%	5.37%
1.25	89.44%	39.44%	10.56%	1.62	94.74%	44.74%	5.26%
1.26	89.62%	39.62%	10.38%	1.63	94.84%	44.84%	5.16%
1.27	89.80%	39.80%	10.20%	1.64	94.95%	44.95%	5.05%
1.28	89.97%	39.97%	10.03%	1.65	95.05%	45.05%	4.95%
1.29	90.15%	40.15%	9.85%	1.66	95.15%	45.15%	4.85%
1.30	90.32%	40.32%	9.68%	1.67	95.25%	45.25%	4.75%
1.31	90.49%	40.49%	9.51%	1.68	95.35%	45.35%	4.65%
1.32	90.66%	40.66%	9.34%	1.69	95.45%	45.45%	4.55%
1.33	90.82%	40.82%	9.18%	1.70	95.54%	45.54%	4.46%
1.34	90.99%	40.99%	9.01%	1.71	95.64%	45.64%	4.36%
1.35	91.15%	41.15%	8.85%	1.72	95.73%	45.73%	4.27%
1.36	91.31%	41.31%	8.69%	1.73	95.82%	45.82%	4.18%
1.37	91.47%	41.47%	8.53%	1.74	95.91%	45.91%	4.09%
1.38	91.62%	41.62%	8.38%	1.75	95.99%	45.99%	4.01%
1.39	91.77%	41.77%	8.23%	1.76	96.08%	46.08%	3.92%
1.40	91.92%	41.92%	8.08%	1.77	96.16%	46.16%	3.84%
1.41	92.07%	42.07%	7.93%	1.78	96.25%	46.25%	3.75%
1.42	92.22%	42.22%	7.78%	1.79	96.33%	46.33%	3.67%
1.43	92.36%	42.36%	7.64%	1.80	96.41%	46.41%	3.59%
1.44	92.51%	42.51%	7.49%	1.81	96.49%	46.49%	3.51%
1.45	92.65%	42.65%	7.35%	1.82	96.56%	46.56%	3.44%
1.46	92.79%	42.79%	7.21%	1.83	96.64%	46.64%	3.36%
1.47	92.92%	42.92%	7.08%	1.84	96.71%	46.71%	3.29%
1.48	93.06%	43.06%	6.94%	1.85	96.78%	46.78%	3.22%
1.49	93.19%	43.19%	6.81%	1.86	96.86%	46.86%	3.14%
1.50	93.32%	43.32%	6.68%	1.87	96.93%	46.93%	3.07%
1.51	93.45%	43.45%	6.55%	1.88	96.99%	46.99%	3.01%
1.52	93.57%	43.57%	6.43%	1.89	97.06%	47.06%	2.94%
1.53	93.70%	43.70%	6.30%	1.90	97.13%	47.13%	2.87%
1.54	93.82%	43.82%	6.18%	1.91	97.19%	47.19%	2.81%
1.55	93.94%	43.94%	6.06%	1.92	97.26%	47.26%	2.74%
1.56	94.06%	44.06%	5.94%	1.93	97.32%	47.32%	2.68%
1.57	94.18%	44.18%	5.82%	1.94	97.38%	47.38%	2.62%
1.58	94.29%	44.29%	5.71%	1.95	97.44%	47.44%	2.56%
1.59	94.41%	44.41%	5.59%	1.96	97.50%	47.50%	2.50%
1.60	94.52%	44.52%	5.48%	1.97	97.56%	47.56%	2.44%

Table 1: *z* Scores (continued)

z score	A Below +*z* Above −*z*	B From mean to *z* or to −*z*	C Above +*z* Below −*z*	*z* score	A Below +*z* Above −*z*	B From mean to *z* or to −*z*	C Above +*z* Below −*z*
1.98	97.61%	47.61%	2.39%	2.35	99.06%	49.06%	0.94%
1.99	97.67%	47.67%	2.33%	2.36	99.09%	49.09%	0.91%
2.00	97.72%	47.72%	2.28%	2.37	99.11%	49.11%	0.89%
2.01	97.78%	47.78%	2.22%	2.38	99.13%	49.13%	0.87%
2.02	97.83%	47.83%	2.17%	2.39	99.16%	49.16%	0.84%
2.03	97.88%	47.88%	2.12%	2.40	99.18%	49.18%	0.82%
2.04	97.93%	47.93%	2.07%	2.41	99.20%	49.20%	0.80%
2.05	97.98%	47.98%	2.02%	2.42	99.22%	49.22%	0.78%
2.06	98.03%	48.03%	1.97%	2.43	99.25%	49.25%	0.75%
2.07	98.08%	48.08%	1.92%	2.44	99.27%	49.27%	0.73%
2.08	98.12%	48.12%	1.88%	2.45	99.29%	49.29%	0.71%
2.09	98.17%	48.17%	1.83%	2.46	99.31%	49.31%	0.69%
2.10	98.21%	48.21%	1.79%	2.47	99.32%	49.32%	0.68%
2.11	98.26%	48.26%	1.74%	2.48	99.34%	49.34%	0.66%
2.12	98.30%	48.30%	1.70%	2.49	99.36%	49.36%	0.64%
2.13	98.34%	48.34%	1.66%	2.50	99.38%	49.38%	0.62%
2.14	98.38%	48.38%	1.62%	2.51	99.40%	49.40%	0.60%
2.15	98.42%	48.42%	1.58%	2.52	99.41%	49.41%	0.59%
2.16	98.46%	48.46%	1.54%	2.53	99.43%	49.43%	0.57%
2.17	98.50%	48.50%	1.50%	2.54	99.45%	49.45%	0.55%
2.18	98.54%	48.54%	1.46%	2.55	99.46%	49.46%	0.54%
2.19	98.57%	48.57%	1.43%	2.56	99.48%	49.48%	0.52%
2.20	98.61%	48.61%	1.39%	2.57	99.49%	49.49%	0.51%
2.21	98.64%	48.64%	1.36%	2.58	99.51%	49.51%	0.49%
2.22	98.68%	48.68%	1.32%	2.59	99.52%	49.52%	0.48%
2.23	98.71%	48.71%	1.29%	2.60	99.53%	49.53%	0.47%
2.24	98.75%	48.75%	1.25%	2.61	99.55%	49.55%	0.45%
2.25	98.78%	48.78%	1.22%	2.62	99.56%	49.56%	0.44%
2.26	98.81%	48.81%	1.19%	2.63	99.57%	49.57%	0.43%
2.27	98.84%	48.84%	1.16%	2.64	99.59%	49.59%	0.41%
2.28	98.87%	48.87%	1.13%	2.65	99.60%	49.60%	0.40%
2.29	98.90%	48.90%	1.10%	2.66	99.61%	49.61%	0.39%
2.30	98.93%	48.93%	1.07%	2.67	99.62%	49.62%	0.38%
2.31	98.96%	48.96%	1.04%	2.68	99.63%	49.63%	0.37%
2.32	98.98%	48.98%	1.02%	2.69	99.64%	49.64%	0.36%
2.33	99.01%	49.01%	0.99%	2.70	99.65%	49.65%	0.35%
2.34	99.04%	49.04%	0.96%	2.71	99.66%	49.66%	0.34%

z score	A Below +z Above −z	B From mean to z or to −z	C Above +z Below −z	z score	A Below +z Above −z	B From mean to z or to −z	C Above +z Below −z
2.72	99.67%	49.67%	0.33%	3.09	99.900%	49.900%	0.100%
2.73	99.68%	49.68%	0.32%	3.10	99.903%	49.903%	0.097%
2.74	99.69%	49.69%	0.31%	3.11	99.906%	49.906%	0.094%
2.75	99.702%	49.702%	0.298%	3.12	99.910%	49.910%	0.090%
2.76	99.711%	49.711%	0.289%	3.13	99.913%	49.913%	0.087%
2.77	99.720%	49.720%	0.280%	3.14	99.916%	49.916%	0.084%
2.78	99.728%	49.728%	0.272%	3.15	99.918%	49.918%	0.082%
2.79	99.736%	49.736%	0.264%	3.16	99.921%	49.921%	0.079%
2.80	99.744%	49.744%	0.256%	3.17	99.924%	49.924%	0.076%
2.81	99.752%	49.752%	0.248%	3.18	99.926%	49.926%	0.074%
2.82	99.760%	49.760%	0.240%	3.19	99.929%	49.929%	0.071%
2.83	99.767%	49.767%	0.233%	3.20	99.931%	49.931%	0.069%
2.84	99.774%	49.774%	0.226%	3.21	99.934%	49.934%	0.066%
2.85	99.781%	49.781%	0.219%	3.22	99.936%	49.936%	0.064%
2.86	99.788%	49.788%	0.212%	3.23	99.938%	49.938%	0.062%
2.87	99.795%	49.795%	0.205%	3.24	99.940%	49.940%	0.060%
2.88	99.801%	49.801%	0.199%	3.25	99.942%	49.942%	0.058%
2.89	99.807%	49.807%	0.193%	3.26	99.944%	49.944%	0.056%
2.90	99.813%	49.813%	0.187%	3.27	99.946%	49.946%	0.054%
2.91	99.819%	49.819%	0.181%	3.28	99.948%	49.948%	0.052%
2.92	99.825%	49.825%	0.175%	3.29	99.950%	49.950%	0.050%
2.93	99.831%	49.831%	0.169%	3.30	99.952%	49.952%	0.048%
2.94	99.836%	49.836%	0.164%	3.31	99.953%	49.953%	0.047%
2.95	99.841%	49.841%	0.159%	3.32	99.955%	49.955%	0.045%
2.96	99.846%	49.846%	0.154%	3.33	99.957%	49.957%	0.043%
2.97	99.851%	49.851%	0.149%	3.34	99.958%	49.958%	0.042%
2.98	99.856%	49.856%	0.144%	3.35	99.960%	49.960%	0.040%
2.99	99.861%	49.861%	0.139%	3.36	99.961%	49.961%	0.039%
3.00	99.865%	49.865%	0.135%	3.37	99.962%	49.962%	0.038%
3.01	99.869%	49.869%	0.131%	3.38	99.964%	49.964%	0.036%
3.02	99.874%	49.874%	0.126%	3.39	99.965%	49.965%	0.035%
3.03	99.878%	49.878%	0.122%	3.40	99.966%	49.966%	0.034%
3.04	99.882%	49.882%	0.118%	3.41	99.968%	49.968%	0.032%
3.05	99.886%	49.886%	0.114%	3.42	99.969%	49.969%	0.031%
3.06	99.889%	49.889%	0.111%	3.43	99.970%	49.970%	0.030%
3.07	99.893%	49.893%	0.107%	3.44	99.971%	49.971%	0.029%
3.08	99.896%	49.896%	0.104%	3.45	99.972%	49.972%	0.028%

Table 1: *z* Scores (continued)

z score	A Below +*z* Above −*z*	B From mean to *z* or to −*z*	C Above +*z* Below −*z*	*z* score	A Below +*z* Above −*z*	B From mean to *z* or to −*z*	C Above +*z* Below −*z*
3.46	99.973%	49.973%	0.027%	3.79	99.9925%	49.9925%	0.0075%
3.47	99.974%	49.974%	0.026%	3.80	99.9928%	49.9928%	0.0072%
3.48	99.975%	49.975%	0.025%	3.81	99.9931%	49.9931%	0.0069%
3.49	99.976%	49.976%	0.024%	3.82	99.9933%	49.9933%	0.0067%
3.50	99.9767%	49.9767%	0.0233%	3.83	99.9936%	49.9936%	0.0064%
3.51	99.9776%	49.9776%	0.0224%	3.84	99.9938%	49.9938%	0.0062%
3.52	99.9784%	49.9784%	0.0216%	3.85	99.9941%	49.9941%	0.0059%
3.53	99.9792%	49.9792%	0.0208%	3.86	99.9943%	49.9943%	0.0057%
3.54	99.9800%	49.9800%	0.0200%	3.87	99.9946%	49.9946%	0.0054%
3.55	99.9807%	49.9807%	0.0193%	3.88	99.9948%	49.9948%	0.0052%
3.56	99.9815%	49.9815%	0.0185%	3.89	99.9950%	49.9950%	0.0050%
3.57	99.9822%	49.9822%	0.0178%	3.90	99.9952%	49.9952%	0.0048%
3.58	99.9828%	49.9828%	0.0172%	3.91	99.9954%	49.9954%	0.0046%
3.59	99.9835%	49.9835%	0.0165%	3.92	99.9956%	49.9956%	0.0044%
3.60	99.9841%	49.9841%	0.0159%	3.93	99.9958%	49.9958%	0.0042%
3.61	99.9847%	49.9847%	0.0153%	3.94	99.9959%	49.9959%	0.0041%
3.62	99.9853%	49.9853%	0.0147%	3.95	99.9961%	49.9961%	0.0039%
3.63	99.9858%	49.9858%	0.0142%	3.96	99.9963%	49.9963%	0.0037%
3.64	99.9864%	49.9864%	0.0136%	3.97	99.9964%	49.9964%	0.0036%
3.65	99.9869%	49.9869%	0.0131%	3.98	99.9966%	49.9966%	0.0034%
3.66	99.9874%	49.9874%	0.0126%	3.99	99.9967%	49.9967%	0.0033%
3.67	99.9879%	49.9879%	0.0121%	4.00	99.9968%	49.9968%	0.0032%
3.68	99.9883%	49.9883%	0.0117%	4.10	99.99793%	49.99793%	0.00207%
3.69	99.9888%	49.9888%	0.0112%	4.20	99.99867%	49.99867%	0.00133%
3.70	99.9892%	49.9892%	0.0108%	4.30	99.99915%	49.99915%	0.00085%
3.71	99.9896%	49.9896%	0.0104%	4.40	99.99946%	49.99946%	0.00054%
3.72	99.9900%	49.9900%	0.0100%	4.50	99.99966%	49.99966%	0.00034%
3.73	99.9904%	49.9904%	0.0096%	4.60	99.99979%	49.99979%	0.00021%
3.74	99.9908%	49.9908%	0.0092%	4.70	99.99987%	49.99987%	0.00013%
3.75	99.9912%	49.9912%	0.0088%	4.80	99.99992%	49.99992%	0.00008%
3.76	99.9915%	49.9915%	0.0085%	4.90	99.99995%	49.99995%	0.00005%
3.77	99.9918%	49.9918%	0.0082%	5.00	99.99997%	49.99997%	0.00003%
3.78	99.9922%	49.9922%	0.0078%				

Table 2: Random Number Table

	A	B	C	D	E	F
1	8607	1887	5432	2039	5502	3174
2	5574	4576	5273	8582	1424	9439
3	5515	8367	6317	6974	3452	2639
4	0296	8870	3197	4853	4434	1571
5	0149	1919	8684	9082	0335	6276
6	8211	4653	2421	8635	8388	2544
7	2848	7715	5620	2649	7561	0766
8	3007	3419	4373	6721	2428	1532
9	2221	4703	7265	4061	9277	0900
10	8670	0480	0672	8572	9597	7785
11	5475	9133	5481	7966	8873	3147
12	7294	5418	1795	5198	4946	1615
13	3498	1061	4566	0370	3225	8464
14	3186	8239	8706	8345	2373	4830
15	7037	6540	9220	6516	0370	8777
16	3953	0689	3746	6861	4949	3386
17	2136	4209	8825	2571	6623	7126
18	3761	0535	4566	6536	9985	5070
19	8048	6079	2496	9461	2638	9390
20	4275	6909	5832	9159	4191	1325
21	2092	1191	7593	4784	9688	0476
22	8545	4468	8530	8935	1195	6530
23	4863	2618	9081	7876	8383	0235
24	8354	8405	4918	4851	6941	4597
25	8010	5343	3199	3236	6898	2562
26	5158	9039	8902	0905	2472	0704
27	9943	8717	2530	0421	1351	7920
28	0540	9804	7933	2358	8892	4633
29	9761	0723	3059	5386	5249	8290
30	1276	9555	5058	5119	1543	2066
31	3625	7693	3127	5576	4385	0356
32	7543	6216	2586	6012	7964	9972
33	5065	2734	6829	6362	6208	1577
34	7910	8629	7253	3425	4733	9927
35	9080	8616	4977	0703	3784	2608
36	4142	9849	7180	0053	6437	4342
37	5633	2804	4612	0386	2020	8173
38	5371	2571	1339	4213	1945	4844
39	1440	2099	5031	6049	5047	6239
40	6914	5610	2821	8760	5634	7445

Table 3: Critical Values of *t*

df	α = .05, one-tailed -or- α = .10, two-tailed	α = .025, one-tailed -or- α = .05, two-tailed	α = .01, one-tailed -or- α = .02, two-tailed	α = .005, one-tailed -or- α =.01, two-tailed
1	6.314	**12.706**	31.821	63.657
2	2.920	**4.303**	6.965	9.925
3	2.353	**3.182**	4.541	5.841
4	2.132	**2.776**	3.747	4.604
5	2.015	**2.571**	3.365	4.032
6	1.943	**2.447**	3.143	3.707
7	1.895	**2.365**	2.998	3.499
8	1.860	**2.306**	2.896	3.355
9	1.833	**2.262**	2.821	3.250
10	1.812	**2.228**	2.764	3.169
11	1.796	**2.201**	2.718	3.106
12	1.782	**2.179**	2.681	3.055
13	1.771	**2.160**	2.650	3.012
14	1.761	**2.145**	2.624	2.977
15	1.753	**2.131**	2.602	2.947
16	1.746	**2.120**	2.583	2.921
17	1.740	**2.110**	2.567	2.898
18	1.734	**2.101**	2.552	2.878
19	1.729	**2.093**	2.539	2.861
20	1.725	**2.086**	2.528	2.845
21	1.721	**2.080**	2.518	2.831
22	1.717	**2.074**	2.508	2.819
23	1.714	**2.069**	2.500	2.807
24	1.711	**2.064**	2.492	2.797
25	1.708	**2.060**	2.485	2.787
26	1.706	**2.056**	2.479	2.779
27	1.703	**2.052**	2.473	2.771
28	1.701	**2.048**	2.467	2.763
29	1.699	**2.045**	2.462	2.756
30	1.697	**2.042**	2.457	2.750
31	1.696	**2.040**	2.453	2.744
32	1.694	**2.037**	2.449	2.738
33	1.692	**2.035**	2.445	2.733
34	1.691	**2.032**	2.441	2.728
35	1.690	**2.030**	2.438	2.724
36	1.688	**2.028**	2.434	2.719
37	1.687	**2.026**	2.431	2.715
38	1.686	**2.024**	2.429	2.712
39	1.685	**2.023**	2.426	2.708

df	α = .05, one-tailed -or- α = .10, two-tailed	α = .025, one-tailed -or- α = .05, two-tailed	α = .01, one-tailed -or- α = .02, two-tailed	α = .005, one-tailed -or- α =.01, two-tailed
40	1.684	**2.021**	2.423	2.704
41	1.683	**2.020**	2.421	2.701
42	1.682	**2.018**	2.418	2.698
43	1.681	**2.017**	2.416	2.695
44	1.680	**2.015**	2.414	2.692
45	1.679	**2.014**	2.412	2.690
46	1.679	**2.013**	2.410	2.687
47	1.678	**2.012**	2.408	2.685
48	1.677	**2.011**	2.407	2.682
49	1.677	**2.010**	2.405	2.680
50	1.676	**2.009**	2.403	2.678
55	1.673	**2.004**	2.396	2.668
60	1.671	**2.000**	2.390	2.660
65	1.669	**1.997**	2.385	2.654
70	1.667	**1.994**	2.381	2.648
75	1.665	**1.992**	2.377	2.643
80	1.664	**1.990**	2.374	2.639
85	1.663	**1.988**	2.371	2.635
90	1.662	**1.987**	2.368	2.632
95	1.661	**1.985**	2.366	2.629
100	1.660	**1.984**	2.364	2.626
120	1.658	**1.980**	2.358	2.617
140	1.656	**1.977**	2.353	2.611
160	1.654	**1.975**	2.350	2.607
180	1.653	**1.973**	2.347	2.603
200	1.653	**1.972**	2.345	2.601
250	1.651	**1.969**	2.341	2.596
300	1.650	**1.968**	2.339	2.592
350	1.649	**1.967**	2.337	2.590
400	1.649	**1.966**	2.336	2.588
450	1.648	**1.965**	2.335	2.587
500	1.648	**1.965**	2.334	2.586
600	1.647	**1.964**	2.333	2.584
700	1.647	**1.963**	2.332	2.583
800	1.647	**1.963**	2.331	2.582
900	1.647	**1.963**	2.330	2.581
1000	1.646	**1.962**	2.330	2.581
∞	1.645	**1.960**	2.326	2.576

Table 4a: Critical Values of F, $\alpha = .05$

Denominator degrees of freedom	Numerator degrees of freedom						
	1	2	3	4	5	6	7
1	161.448	199.500	215.707	224.583	230.162	233.986	236.768
2	18.513	19.000	19.164	19.247	19.296	19.330	19.353
3	10.128	9.552	9.277	9.117	9.013	8.941	8.887
4	7.709	6.944	6.591	6.388	6.256	6.163	6.094
5	6.608	5.786	5.409	5.192	5.050	4.950	4.876
6	5.987	5.143	4.757	4.534	4.387	4.284	4.207
7	5.591	4.737	4.347	4.120	3.972	3.866	3.787
8	5.318	4.459	4.066	3.838	3.687	3.581	3.500
9	5.117	4.256	3.863	3.633	3.482	3.374	3.293
10	4.965	4.103	3.708	3.478	3.326	3.217	3.135
11	4.844	3.982	3.587	3.357	3.204	3.095	3.012
12	4.747	3.885	3.490	3.259	3.106	2.996	2.913
13	4.667	3.806	3.411	3.179	3.025	2.915	2.832
14	4.600	3.739	3.344	3.112	2.958	2.848	2.764
15	4.543	3.682	3.287	3.056	2.901	2.790	2.707
16	4.494	3.634	3.239	3.007	2.852	2.741	2.657
17	4.451	3.592	3.197	2.965	2.810	2.699	2.614
18	4.414	3.555	3.160	2.928	2.773	2.661	2.577
19	4.381	3.522	3.127	2.895	2.740	2.628	2.544
20	4.351	3.493	3.098	2.866	2.711	2.599	2.514
21	4.325	3.467	3.072	2.840	2.685	2.573	2.488
22	4.301	3.443	3.049	2.817	2.661	2.549	2.464
23	4.279	3.422	3.028	2.796	2.640	2.528	2.442
24	4.260	3.403	3.009	2.776	2.621	2.508	2.423
25	4.242	3.385	2.991	2.759	2.603	2.490	2.405
26	4.225	3.369	2.975	2.743	2.587	2.474	2.388
27	4.210	3.354	2.960	2.728	2.572	2.459	2.373
28	4.196	3.340	2.947	2.714	2.558	2.445	2.359
29	4.183	3.328	2.934	2.701	2.545	2.432	2.346
30	4.171	3.316	2.922	2.690	2.534	2.421	2.334
31	4.160	3.305	2.911	2.679	2.523	2.409	2.323
32	4.149	3.295	2.901	2.668	2.512	2.399	2.313
33	4.139	3.285	2.892	2.659	2.503	2.389	2.303
34	4.130	3.276	2.883	2.650	2.494	2.380	2.294
35	4.121	3.267	2.874	2.641	2.485	2.372	2.285
36	4.113	3.259	2.866	2.634	2.477	2.364	2.277
37	4.105	3.252	2.859	2.626	2.470	2.356	2.270
38	4.098	3.245	2.852	2.619	2.463	2.349	2.262

Numerator degrees of freedom								
8	9	10	11	12	13	14	15	16
238.883	240.543	241.882	242.983	243.906	244.690	245.364	245.950	246.464
19.371	19.385	19.396	19.405	19.413	19.419	19.424	19.429	19.433
8.845	8.812	8.786	8.763	8.745	8.729	8.715	8.703	8.692
6.041	5.999	5.964	5.936	5.912	5.891	5.873	5.858	5.844
4.818	4.772	4.735	4.704	4.678	4.655	4.636	4.619	4.604
4.147	4.099	4.060	4.027	4.000	3.976	3.956	3.938	3.922
3.726	3.677	3.637	3.603	3.575	3.550	3.529	3.511	3.494
3.438	3.388	3.347	3.313	3.284	3.259	3.237	3.218	3.202
3.230	3.179	3.137	3.102	3.073	3.048	3.025	3.006	2.989
3.072	3.020	2.978	2.943	2.913	2.887	2.865	2.845	2.828
2.948	2.896	2.854	2.818	2.788	2.761	2.739	2.719	2.701
2.849	2.796	2.753	2.717	2.687	2.660	2.637	2.617	2.599
2.767	2.714	2.671	2.635	2.604	2.577	2.554	2.533	2.515
2.699	2.646	2.602	2.565	2.534	2.507	2.484	2.463	2.445
2.641	2.588	2.544	2.507	2.475	2.448	2.424	2.403	2.385
2.591	2.538	2.494	2.456	2.425	2.397	2.373	2.352	2.333
2.548	2.494	2.450	2.413	2.381	2.353	2.329	2.308	2.289
2.510	2.456	2.412	2.374	2.342	2.314	2.290	2.269	2.250
2.477	2.423	2.378	2.340	2.308	2.280	2.256	2.234	2.215
2.447	2.393	2.348	2.310	2.278	2.250	2.225	2.203	2.184
2.420	2.366	2.321	2.283	2.250	2.222	2.197	2.176	2.156
2.397	2.342	2.297	2.259	2.226	2.198	2.173	2.151	2.131
2.375	2.320	2.275	2.236	2.204	2.175	2.150	2.128	2.109
2.355	2.300	2.255	2.216	2.183	2.155	2.130	2.108	2.088
2.337	2.282	2.236	2.198	2.165	2.136	2.111	2.089	2.069
2.321	2.265	2.220	2.181	2.148	2.119	2.094	2.072	2.052
2.305	2.250	2.204	2.166	2.132	2.103	2.078	2.056	2.036
2.291	2.236	2.190	2.151	2.118	2.089	2.064	2.041	2.021
2.278	2.223	2.177	2.138	2.104	2.075	2.050	2.027	2.007
2.266	2.211	2.165	2.126	2.092	2.063	2.037	2.015	1.995
2.255	2.199	2.153	2.114	2.080	2.051	2.026	2.003	1.983
2.244	2.189	2.142	2.103	2.070	2.040	2.015	1.992	1.972
2.235	2.179	2.133	2.093	2.060	2.030	2.004	1.982	1.961
2.225	2.170	2.123	2.084	2.050	2.021	1.995	1.972	1.952
2.217	2.161	2.114	2.075	2.041	2.012	1.986	1.963	1.942
2.209	2.153	2.106	2.067	2.033	2.003	1.977	1.954	1.934
2.201	2.145	2.098	2.059	2.025	1.995	1.969	1.946	1.926
2.194	2.138	2.091	2.051	2.017	1.988	1.962	1.939	1.918

Table 4a: Critical Values of F, $\alpha = .05$ (continued)

Denominator degrees of freedom	Numerator degrees of freedom						
	1	2	3	4	5	6	7
39	4.091	3.238	2.845	2.612	2.456	2.342	2.255
40	4.085	3.232	2.839	2.606	2.449	2.336	2.249
41	4.079	3.226	2.833	2.600	2.443	2.330	2.243
42	4.073	3.220	2.827	2.594	2.438	2.324	2.237
43	4.067	3.214	2.822	2.589	2.432	2.318	2.232
44	4.062	3.209	2.816	2.584	2.427	2.313	2.226
45	4.057	3.204	2.812	2.579	2.422	2.308	2.221
46	4.052	3.200	2.807	2.574	2.417	2.304	2.216
47	4.047	3.195	2.802	2.570	2.413	2.299	2.212
48	4.043	3.191	2.798	2.565	2.409	2.295	2.207
49	4.038	3.187	2.794	2.561	2.404	2.290	2.203
50	4.034	3.183	2.790	2.557	2.400	2.286	2.199
55	4.016	3.165	2.773	2.540	2.383	2.269	2.181
60	4.001	3.150	2.758	2.525	2.368	2.254	2.167
65	3.989	3.138	2.746	2.513	2.356	2.242	2.154
70	3.978	3.128	2.736	2.503	2.346	2.231	2.143
75	3.968	3.119	2.727	2.494	2.337	2.222	2.134
80	3.960	3.111	2.719	2.486	2.329	2.214	2.126
85	3.953	3.104	2.712	2.479	2.322	2.207	2.119
90	3.947	3.098	2.706	2.473	2.316	2.201	2.113
95	3.941	3.092	2.700	2.467	2.310	2.196	2.108
100	3.936	3.087	2.696	2.463	2.305	2.191	2.103
120	3.920	3.072	2.680	2.447	2.290	2.175	2.087
140	3.909	3.061	2.669	2.436	2.279	2.164	2.076
160	3.900	3.053	2.661	2.428	2.271	2.156	2.067
180	3.894	3.046	2.655	2.422	2.264	2.149	2.061
200	3.888	3.041	2.650	2.417	2.259	2.144	2.056
250	3.879	3.032	2.641	2.408	2.250	2.135	2.046
300	3.873	3.026	2.635	2.402	2.244	2.129	2.040
350	3.868	3.022	2.630	2.397	2.240	2.125	2.036
400	3.865	3.018	2.627	2.394	2.237	2.121	2.032
450	3.862	3.016	2.625	2.392	2.234	2.119	2.030
500	3.860	3.014	2.623	2.390	2.232	2.117	2.028
600	3.857	3.011	2.620	2.387	2.229	2.114	2.025
700	3.855	3.009	2.618	2.385	2.227	2.112	2.023
800	3.853	3.007	2.616	2.383	2.225	2.110	2.021
900	3.852	3.006	2.615	2.382	2.224	2.109	2.020
1000	3.851	3.005	2.614	2.381	2.223	2.108	2.019
∞	3.841	2.996	2.605	2.372	2.214	2.099	2.010

Numerator degrees of freedom								
8	9	10	11	12	13	14	15	16
2.187	2.131	2.084	2.044	2.010	1.981	1.954	1.931	1.911
2.180	2.124	2.077	2.038	2.003	1.974	1.948	1.924	1.904
2.174	2.118	2.071	2.031	1.997	1.967	1.941	1.918	1.897
2.168	2.112	2.065	2.025	1.991	1.961	1.935	1.912	1.891
2.163	2.106	2.059	2.020	1.985	1.955	1.929	1.906	1.885
2.157	2.101	2.054	2.014	1.980	1.950	1.924	1.900	1.879
2.152	2.096	2.049	2.009	1.974	1.945	1.918	1.895	1.874
2.147	2.091	2.044	2.004	1.969	1.940	1.913	1.890	1.869
2.143	2.086	2.039	1.999	1.965	1.935	1.908	1.885	1.864
2.138	2.082	2.035	1.995	1.960	1.930	1.904	1.880	1.859
2.134	2.077	2.030	1.990	1.956	1.926	1.899	1.876	1.855
2.130	2.073	2.026	1.986	1.952	1.921	1.895	1.871	1.850
2.112	2.055	2.008	1.968	1.933	1.903	1.876	1.852	1.831
2.097	2.040	1.993	1.952	1.917	1.887	1.860	1.836	1.815
2.084	2.027	1.980	1.939	1.904	1.874	1.847	1.823	1.802
2.074	2.017	1.969	1.928	1.893	1.863	1.836	1.812	1.790
2.064	2.007	1.959	1.919	1.884	1.853	1.826	1.802	1.780
2.056	1.999	1.951	1.910	1.875	1.845	1.817	1.793	1.772
2.049	1.992	1.944	1.903	1.868	1.837	1.810	1.786	1.764
2.043	1.986	1.938	1.897	1.861	1.830	1.803	1.779	1.757
2.037	1.980	1.932	1.891	1.856	1.825	1.797	1.773	1.751
2.032	1.975	1.927	1.886	1.850	1.819	1.792	1.768	1.746
2.016	1.959	1.910	1.869	1.834	1.803	1.775	1.750	1.728
2.005	1.947	1.899	1.858	1.822	1.791	1.763	1.738	1.716
1.997	1.939	1.890	1.849	1.813	1.782	1.754	1.729	1.707
1.990	1.932	1.884	1.842	1.806	1.775	1.747	1.722	1.700
1.985	1.927	1.878	1.837	1.801	1.769	1.742	1.717	1.694
1.976	1.917	1.869	1.827	1.791	1.759	1.732	1.707	1.684
1.969	1.911	1.862	1.821	1.785	1.753	1.725	1.700	1.677
1.965	1.907	1.858	1.816	1.780	1.748	1.720	1.695	1.672
1.962	1.903	1.854	1.813	1.776	1.745	1.717	1.691	1.669
1.959	1.901	1.852	1.810	1.774	1.742	1.714	1.689	1.666
1.957	1.899	1.850	1.808	1.772	1.740	1.712	1.686	1.664
1.954	1.895	1.846	1.805	1.768	1.736	1.708	1.683	1.660
1.952	1.893	1.844	1.802	1.766	1.734	1.706	1.681	1.658
1.950	1.892	1.843	1.801	1.764	1.732	1.704	1.679	1.656
1.949	1.890	1.841	1.799	1.763	1.731	1.703	1.678	1.655
1.948	1.889	1.840	1.798	1.762	1.730	1.702	1.676	1.654
1.938	1.880	1.831	1.789	1.752	1.720	1.692	1.666	1.644

Table 4b: Critical Values of *F*, $\alpha = .01$

Denominator degrees of freedom	Numerator degrees of freedom 1	2	3	4	5	6	7
1	4052.18	4999.50	5403.35	5624.58	5763.65	5858.99	5928.36
2	98.503	99.000	99.166	99.249	99.299	99.333	99.356
3	34.116	30.817	29.457	28.710	28.237	27.911	27.672
4	21.198	18.000	16.694	15.977	15.522	15.207	14.976
5	16.258	13.274	12.060	11.392	10.967	10.672	10.456
6	13.745	10.925	9.780	9.148	8.746	8.466	8.260
7	12.246	9.547	8.451	7.847	7.460	7.191	6.993
8	11.259	8.649	7.591	7.006	6.632	6.371	6.178
9	10.561	8.022	6.992	6.422	6.057	5.802	5.613
10	10.044	7.559	6.552	5.994	5.636	5.386	5.200
11	9.646	7.206	6.217	5.668	5.316	5.069	4.886
12	9.330	6.927	5.953	5.412	5.064	4.821	4.640
13	9.074	6.701	5.739	5.205	4.862	4.620	4.441
14	8.862	6.515	5.564	5.035	4.695	4.456	4.278
15	8.683	6.359	5.417	4.893	4.556	4.318	4.142
16	8.531	6.226	5.292	4.773	4.437	4.202	4.026
17	8.400	6.112	5.185	4.669	4.336	4.102	3.927
18	8.285	6.013	5.092	4.579	4.248	4.015	3.841
19	8.185	5.926	5.010	4.500	4.171	3.939	3.765
20	8.096	5.849	4.938	4.431	4.103	3.871	3.699
21	8.017	5.780	4.874	4.369	4.042	3.812	3.640
22	7.945	5.719	4.817	4.313	3.988	3.758	3.587
23	7.881	5.664	4.765	4.264	3.939	3.710	3.539
24	7.823	5.614	4.718	4.218	3.895	3.667	3.496
25	7.770	5.568	4.675	4.177	3.855	3.627	3.457
26	7.721	5.526	4.637	4.140	3.818	3.591	3.421
27	7.677	5.488	4.601	4.106	3.785	3.558	3.388
28	7.636	5.453	4.568	4.074	3.754	3.528	3.358
29	7.598	5.420	4.538	4.045	3.725	3.499	3.330
30	7.562	5.390	4.510	4.018	3.699	3.473	3.304
31	7.530	5.362	4.484	3.993	3.675	3.449	3.281
32	7.499	5.336	4.459	3.969	3.652	3.427	3.258
33	7.471	5.312	4.437	3.948	3.630	3.406	3.238
34	7.444	5.289	4.416	3.927	3.611	3.386	3.218
35	7.419	5.268	4.396	3.908	3.592	3.368	3.200
36	7.396	5.248	4.377	3.890	3.574	3.351	3.183
37	7.373	5.229	4.360	3.873	3.558	3.334	3.167
38	7.353	5.211	4.343	3.858	3.542	3.319	3.152

Numerator degrees of freedom								
8	9	10	11	12	13	14	15	16
5981.07	6022.47	6055.85	6083.32	6106.32	6125.86	6142.67	6157.28	6170.10
99.374	99.388	99.399	99.408	99.416	99.422	99.428	99.433	99.437
27.489	27.345	27.229	27.133	27.052	26.983	26.924	26.872	26.827
14.799	14.659	14.546	14.452	14.374	14.307	14.249	14.198	14.154
10.289	10.158	10.051	9.963	9.888	9.825	9.770	9.722	9.680
8.102	7.976	7.874	7.790	7.718	7.657	7.605	7.559	7.519
6.840	6.719	6.620	6.538	6.469	6.410	6.359	6.314	6.275
6.029	5.911	5.814	5.734	5.667	5.609	5.559	5.515	5.477
5.467	5.351	5.257	5.178	5.111	5.055	5.005	4.962	4.924
5.057	4.942	4.849	4.772	4.706	4.650	4.601	4.558	4.520
4.744	4.632	4.539	4.462	4.397	4.342	4.293	4.251	4.213
4.499	4.388	4.296	4.220	4.155	4.100	4.052	4.010	3.972
4.302	4.191	4.100	4.025	3.960	3.905	3.857	3.815	3.778
4.140	4.030	3.939	3.864	3.800	3.745	3.698	3.656	3.619
4.004	3.895	3.805	3.730	3.666	3.612	3.564	3.522	3.485
3.890	3.780	3.691	3.616	3.553	3.498	3.451	3.409	3.372
3.791	3.682	3.593	3.519	3.455	3.401	3.353	3.312	3.275
3.705	3.597	3.508	3.434	3.371	3.316	3.269	3.227	3.190
3.631	3.523	3.434	3.360	3.297	3.242	3.195	3.153	3.116
3.564	3.457	3.368	3.294	3.231	3.177	3.130	3.088	3.051
3.506	3.398	3.310	3.236	3.173	3.119	3.072	3.030	2.993
3.453	3.346	3.258	3.184	3.121	3.067	3.019	2.978	2.941
3.406	3.299	3.211	3.137	3.074	3.020	2.973	2.931	2.894
3.363	3.256	3.168	3.094	3.032	2.977	2.930	2.889	2.852
3.324	3.217	3.129	3.056	2.993	2.939	2.892	2.850	2.813
3.288	3.182	3.094	3.021	2.958	2.904	2.857	2.815	2.778
3.256	3.149	3.062	2.988	2.926	2.871	2.824	2.783	2.746
3.226	3.120	3.032	2.959	2.896	2.842	2.795	2.753	2.716
3.198	3.092	3.005	2.931	2.868	2.814	2.767	2.726	2.689
3.173	3.067	2.979	2.906	2.843	2.789	2.742	2.700	2.663
3.149	3.043	2.955	2.882	2.820	2.765	2.718	2.677	2.640
3.127	3.021	2.934	2.860	2.798	2.744	2.696	2.655	2.618
3.106	3.000	2.913	2.840	2.777	2.723	2.676	2.634	2.597
3.087	2.981	2.894	2.821	2.758	2.704	2.657	2.615	2.578
3.069	2.963	2.876	2.803	2.740	2.686	2.639	2.597	2.560
3.052	2.946	2.859	2.786	2.723	2.669	2.622	2.580	2.543
3.036	2.930	2.843	2.770	2.707	2.653	2.606	2.564	2.527
3.021	2.915	2.828	2.755	2.692	2.638	2.591	2.549	2.512

Table 4b: Critical Values of *F*, $\alpha = .01$ (continued)

Denominator degrees of freedom	Numerator degrees of freedom						
	1	2	3	4	5	6	7
39	7.333	5.194	4.327	3.843	3.528	3.305	3.137
40	7.314	5.179	4.313	3.828	3.514	3.291	3.124
41	7.296	5.163	4.299	3.815	3.501	3.278	3.111
42	7.280	5.149	4.285	3.802	3.488	3.266	3.099
43	7.264	5.136	4.273	3.790	3.476	3.254	3.087
44	7.248	5.123	4.261	3.778	3.465	3.243	3.076
45	7.234	5.110	4.249	3.767	3.454	3.232	3.066
46	7.220	5.099	4.238	3.757	3.444	3.222	3.056
47	7.207	5.087	4.228	3.747	3.434	3.213	3.046
48	7.194	5.077	4.218	3.737	3.425	3.204	3.037
49	7.182	5.066	4.208	3.728	3.416	3.195	3.028
50	7.171	5.057	4.199	3.720	3.408	3.186	3.020
55	7.119	5.013	4.159	3.681	3.370	3.149	2.983
60	7.077	4.977	4.126	3.649	3.339	3.119	2.953
65	7.042	4.947	4.098	3.622	3.313	3.093	2.928
70	7.011	4.922	4.074	3.600	3.291	3.071	2.906
75	6.985	4.900	4.054	3.580	3.272	3.052	2.887
80	6.963	4.881	4.036	3.563	3.255	3.036	2.871
85	6.943	4.864	4.021	3.548	3.240	3.022	2.857
90	6.925	4.849	4.007	3.535	3.228	3.009	2.845
95	6.909	4.836	3.995	3.523	3.216	2.998	2.833
100	6.895	4.824	3.984	3.513	3.206	2.988	2.823
120	6.851	4.787	3.949	3.480	3.174	2.956	2.792
140	6.819	4.760	3.925	3.456	3.151	2.933	2.769
160	6.796	4.740	3.906	3.439	3.134	2.917	2.753
180	6.778	4.725	3.892	3.425	3.120	2.904	2.740
200	6.763	4.713	3.881	3.414	3.110	2.893	2.730
250	6.737	4.691	3.861	3.395	3.091	2.875	2.711
300	6.720	4.677	3.848	3.382	3.079	2.862	2.699
350	6.708	4.666	3.838	3.373	3.070	2.854	2.691
400	6.699	4.659	3.831	3.366	3.063	2.847	2.684
450	6.692	4.653	3.825	3.361	3.058	2.842	2.679
500	6.686	4.648	3.821	3.357	3.054	2.838	2.675
600	6.677	4.641	3.814	3.351	3.048	2.832	2.669
700	6.671	4.636	3.810	3.346	3.043	2.828	2.665
800	6.667	4.632	3.806	3.343	3.040	2.825	2.662
900	6.663	4.629	3.803	3.340	3.038	2.822	2.659
1000	6.660	4.626	3.801	3.338	3.036	2.820	2.657
∞	6.635	4.605	3.782	3.319	3.017	2.802	2.639

Numerator degrees of freedom								
8	9	10	11	12	13	14	15	16
3.006	2.901	2.814	2.741	2.678	2.624	2.577	2.535	2.498
2.993	2.888	2.801	2.727	2.665	2.611	2.563	2.522	2.484
2.980	2.875	2.788	2.715	2.652	2.598	2.551	2.509	2.472
2.968	2.863	2.776	2.703	2.640	2.586	2.539	2.497	2.460
2.957	2.851	2.764	2.691	2.629	2.575	2.527	2.485	2.448
2.946	2.840	2.754	2.680	2.618	2.564	2.516	2.475	2.437
2.935	2.830	2.743	2.670	2.608	2.553	2.506	2.464	2.427
2.925	2.820	2.733	2.660	2.598	2.544	2.496	2.454	2.417
2.916	2.811	2.724	2.651	2.588	2.534	2.487	2.445	2.408
2.907	2.802	2.715	2.642	2.579	2.525	2.478	2.436	2.399
2.898	2.793	2.706	2.633	2.571	2.517	2.469	2.427	2.390
2.890	2.785	2.698	2.625	2.562	2.508	2.461	2.419	2.382
2.853	2.748	2.662	2.589	2.526	2.472	2.424	2.382	2.345
2.823	2.718	2.632	2.559	2.496	2.442	2.394	2.352	2.315
2.798	2.693	2.607	2.534	2.471	2.417	2.369	2.327	2.289
2.777	2.672	2.585	2.512	2.450	2.395	2.348	2.306	2.268
2.758	2.653	2.567	2.494	2.431	2.377	2.329	2.287	2.249
2.742	2.637	2.551	2.478	2.415	2.361	2.313	2.271	2.233
2.728	2.623	2.537	2.464	2.401	2.347	2.299	2.257	2.219
2.715	2.611	2.524	2.451	2.389	2.334	2.286	2.244	2.206
2.704	2.600	2.513	2.440	2.378	2.323	2.275	2.233	2.195
2.694	2.590	2.503	2.430	2.368	2.313	2.265	2.223	2.185
2.663	2.559	2.472	2.399	2.336	2.282	2.234	2.192	2.154
2.641	2.536	2.450	2.377	2.314	2.260	2.212	2.169	2.131
2.624	2.520	2.434	2.360	2.298	2.243	2.195	2.153	2.114
2.611	2.507	2.421	2.348	2.285	2.230	2.182	2.140	2.102
2.601	2.497	2.411	2.338	2.275	2.220	2.172	2.129	2.091
2.583	2.479	2.392	2.319	2.257	2.202	2.154	2.111	2.073
2.571	2.467	2.380	2.307	2.244	2.190	2.142	2.099	2.061
2.562	2.458	2.372	2.299	2.236	2.181	2.133	2.090	2.052
2.556	2.452	2.365	2.292	2.229	2.175	2.126	2.084	2.045
2.551	2.447	2.360	2.287	2.224	2.170	2.121	2.079	2.040
2.547	2.443	2.356	2.283	2.220	2.166	2.117	2.075	2.036
2.541	2.437	2.351	2.277	2.214	2.160	2.111	2.069	2.030
2.537	2.433	2.346	2.273	2.210	2.155	2.107	2.064	2.026
2.533	2.429	2.343	2.270	2.207	2.152	2.104	2.061	2.023
2.531	2.427	2.341	2.267	2.204	2.150	2.101	2.058	2.020
2.529	2.425	2.339	2.265	2.203	2.148	2.099	2.056	2.018
2.511	2.407	2.321	2.248	2.185	2.130	2.082	2.039	2.000

Table 5a: Studentized Range (q) Values, $\alpha = .05$

Degrees of freedom	k = 2	3	4	5	6	7	8	9	10	11	12
1	17.97	26.98	32.82	37.08	40.41	43.12	45.40	47.36	49.07	50.59	51.96
2	6.09	8.33	9.80	10.88	11.73	12.43	13.03	13.54	13.99	14.40	14.76
3	4.50	5.91	6.83	7.50	8.04	8.48	8.85	9.18	9.46	9.72	9.95
4	3.93	5.04	5.76	6.29	6.71	7.05	7.35	7.60	7.83	8.03	8.21
5	3.64	4.60	5.22	5.67	6.03	6.33	6.58	6.80	7.00	7.17	7.32
6	3.46	4.34	4.90	5.31	5.63	5.90	6.12	6.32	6.49	6.65	6.79
7	3.34	4.17	4.68	5.06	5.36	5.61	5.82	6.00	6.16	6.30	6.43
8	3.26	4.04	4.53	4.89	5.17	5.40	5.60	5.77	5.92	6.05	6.18
9	3.20	3.95	4.42	4.76	5.02	5.24	5.43	5.60	5.74	5.87	5.98
10	3.15	3.88	4.33	4.65	4.91	5.12	5.30	5.46	5.60	5.72	5.83
11	3.11	3.82	4.26	4.57	4.82	5.03	5.20	5.35	5.49	5.61	5.71
12	3.08	3.77	4.20	4.51	4.75	4.95	5.12	5.27	5.40	5.51	5.62
13	3.06	3.73	4.15	4.45	4.69	4.88	5.05	5.19	5.32	5.43	5.53
14	3.03	3.70	4.11	4.41	4.64	4.83	4.99	5.13	5.25	5.36	5.46
15	3.01	3.67	4.08	4.37	4.60	4.78	4.94	5.08	5.20	5.31	5.40
16	3.00	3.65	4.05	4.33	4.56	4.74	4.90	5.03	5.15	5.26	5.35
17	2.98	3.63	4.02	4.30	4.52	4.71	4.86	4.99	5.11	5.21	5.31
18	2.97	3.61	4.00	4.28	4.49	4.67	4.82	4.96	5.07	5.17	5.27
19	2.96	3.59	3.98	4.25	4.47	4.65	4.79	4.92	5.04	5.14	5.23
20	2.95	3.58	3.96	4.23	4.45	4.62	4.77	4.90	5.01	5.11	5.20
24	2.92	3.53	3.90	4.17	4.37	4.54	4.68	4.81	4.92	5.01	5.10
30	2.89	3.49	3.85	4.10	4.30	4.46	4.60	4.72	4.82	4.92	5.00
40	2.86	3.44	3.79	4.04	4.23	4.39	4.52	4.63	4.74	4.82	4.90
60	2.83	3.40	3.74	3.98	4.16	4.31	4.44	4.55	4.65	4.73	4.81
120	2.80	3.36	3.69	3.92	4.10	4.24	4.36	4.47	4.56	4.64	4.71
∞	2.77	3.31	3.63	3.86	4.03	4.17	4.29	4.39	4.47	4.55	4.62

						k							
	13	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**30**	**40**	**60**	**80**	**100**
	53.20	54.33	55.36	56.32	57.22	58.04	58.83	59.56	65.15	68.92	73.97	77.40	79.98
	15.09	15.39	15.65	15.92	16.14	16.38	16.57	16.78	18.27	19.28	20.66	21.59	22.29
	10.15	10.35	10.52	10.69	10.84	10.98	11.11	11.24	12.21	12.86	13.76	14.36	14.82
	8.37	8.52	8.66	8.79	8.91	9.03	9.13	9.23	10.00	10.53	11.24	11.73	12.10
	7.47	7.60	7.72	7.83	7.93	8.03	8.12	8.21	8.88	9.33	9.95	10.37	10.69
	6.92	7.03	7.14	7.24	7.34	7.43	7.51	7.59	8.19	8.60	9.16	9.55	9.84
	6.55	6.66	6.76	6.85	6.94	7.02	7.10	7.17	7.73	8.11	8.63	8.99	9.26
	6.29	6.39	6.48	6.57	6.65	6.73	6.80	6.87	7.40	7.76	8.25	8.59	8.84
	6.09	6.19	6.28	6.36	6.44	6.51	6.58	6.64	7.14	7.49	7.96	8.28	8.53
	5.94	6.03	6.11	6.19	6.27	6.34	6.41	6.47	6.95	7.28	7.73	8.04	8.28
	5.81	5.90	5.98	6.06	6.13	6.20	6.27	6.33	6.79	7.11	7.55	7.85	8.08
	5.71	5.80	5.88	5.95	6.02	6.09	6.15	6.21	6.66	6.97	7.39	7.69	7.91
	5.63	5.71	5.79	5.86	5.93	6.00	6.06	6.11	6.55	6.85	7.27	7.55	7.77
	5.55	5.64	5.71	5.79	5.85	5.92	5.97	6.03	6.46	6.75	7.16	7.44	7.65
	5.49	5.57	5.65	5.72	5.79	5.85	5.90	5.96	6.38	6.67	7.07	7.34	7.55
	5.44	5.52	5.59	5.66	5.73	5.79	5.84	5.90	6.31	6.59	6.98	7.25	7.46
	5.39	5.47	5.54	5.61	5.68	5.73	5.79	5.84	6.25	6.53	6.91	7.18	7.38
	5.35	5.43	5.50	5.57	5.63	5.69	5.74	5.79	6.20	6.47	6.85	7.11	7.31
	5.31	5.39	5.46	5.53	5.59	5.65	5.70	5.75	6.15	6.42	6.79	7.05	7.24
	5.28	5.36	5.43	5.49	5.55	5.61	5.66	5.71	6.10	6.37	6.74	6.99	7.19
	5.18	5.25	5.32	5.38	5.44	5.49	5.55	5.59	5.97	6.23	6.58	6.82	7.01
	5.08	5.15	5.21	5.27	5.33	5.38	5.43	5.48	5.83	6.08	6.42	6.65	6.83
	4.98	5.04	5.11	5.16	5.22	5.27	5.31	5.36	5.70	5.93	6.26	6.48	6.65
	4.88	4.94	5.00	5.06	5.11	5.15	5.20	5.24	5.57	5.79	6.09	6.30	6.46
	4.78	4.84	4.90	4.95	5.00	5.04	5.09	5.13	5.43	5.64	5.93	6.13	6.28
	4.69	4.74	4.80	4.85	4.89	4.93	4.97	5.01	5.30	5.50	5.76	5.95	6.09

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Table 5b: Studentized Range (q) Values, $\alpha = .01$

Degrees of freedom	k = 2	3	4	5	6	7	8	9	10	11	12
1	90.02	135.00	164.30	185.60	202.20	215.80	227.20	237.00	245.60	253.20	260.00
2	14.04	19.02	22.29	24.72	26.63	28.20	29.53	30.68	31.69	32.59	33.40
3	8.26	10.62	12.17	13.32	14.24	15.00	15.65	16.21	16.69	17.13	17.53
4	6.51	8.12	9.17	9.96	10.58	11.10	11.54	11.92	12.26	12.57	12.84
5	5.70	6.98	7.80	8.42	8.91	9.32	9.67	9.97	10.24	10.48	10.70
6	5.24	6.33	7.03	7.56	7.97	8.32	8.61	8.87	9.10	9.30	9.49
7	4.95	5.92	6.54	7.01	7.37	7.68	7.94	8.17	8.37	8.55	8.71
8	4.75	5.64	6.20	6.63	6.96	7.24	7.47	7.68	7.86	8.03	8.18
9	4.60	5.43	5.96	6.35	6.66	6.92	7.13	7.33	7.49	7.65	7.78
10	4.48	5.27	5.77	6.14	6.43	6.67	6.88	7.05	7.21	7.36	7.49
11	4.39	5.15	5.62	5.97	6.25	6.48	6.67	6.84	6.99	7.13	7.25
12	4.32	5.05	5.50	5.84	6.10	6.32	6.51	6.67	6.81	6.94	7.06
13	4.26	4.96	5.40	5.73	5.98	6.19	6.37	6.53	6.67	6.79	6.90
14	4.21	4.90	5.32	5.63	5.88	6.09	6.26	6.41	6.54	6.66	6.77
15	4.17	4.84	5.25	5.56	5.80	5.99	6.16	6.31	6.44	6.56	6.66
16	4.13	4.79	5.19	5.49	5.72	5.92	6.08	6.22	6.35	6.46	6.56
17	4.10	4.74	5.14	5.43	5.66	5.85	6.01	6.15	6.27	6.38	6.48
18	4.07	4.70	5.09	5.38	5.60	5.79	5.94	6.08	6.20	6.31	6.41
19	4.05	4.67	5.05	5.33	5.55	5.74	5.89	6.02	6.14	6.25	6.34
20	4.02	4.64	5.02	5.29	5.51	5.69	5.84	5.97	6.09	6.19	6.29
24	3.96	4.55	4.91	5.17	5.37	5.54	5.69	5.81	5.92	6.02	6.11
30	3.89	4.46	4.80	5.05	5.24	5.40	5.54	5.65	5.76	5.85	5.93
40	3.83	4.37	4.70	4.93	5.11	5.27	5.39	5.50	5.60	5.69	5.76
60	3.76	4.28	4.59	4.82	4.99	5.13	5.25	5.36	5.45	5.53	5.60
120	3.70	4.20	4.50	4.71	4.87	5.01	5.12	5.21	5.30	5.38	5.44
∞	3.64	4.12	4.40	4.60	4.76	4.88	4.99	5.08	5.16	5.23	5.29

						k							
	13	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**30**	**40**	**60**	**80**	**100**
	90.02	135.00	164.30	185.60	202.20	215.80	227.20	237.00	245.60	253.20	260.00	77.40	79.98
	14.04	19.02	22.29	24.72	26.63	28.20	29.53	30.68	31.69	32.59	33.40	21.59	22.29
	8.26	10.62	12.17	13.32	14.24	15.00	15.65	16.21	16.69	17.13	17.53	14.36	14.82
	6.51	8.12	9.17	9.96	10.58	11.10	11.54	11.92	12.26	12.57	12.84	11.73	12.10
	5.70	6.98	7.80	8.42	8.91	9.32	9.67	9.97	10.24	10.48	10.70	10.37	10.69
	5.24	6.33	7.03	7.56	7.97	8.32	8.61	8.87	9.10	9.30	9.49	9.55	9.84
	4.95	5.92	6.54	7.01	7.37	7.68	7.94	8.17	8.37	8.55	8.71	8.99	9.26
	4.75	5.64	6.20	6.63	6.96	7.24	7.47	7.68	7.86	8.03	8.18	8.59	8.84
	4.60	5.43	5.96	6.35	6.66	6.92	7.13	7.33	7.49	7.65	7.78	8.28	8.53
	4.48	5.27	5.77	6.14	6.43	6.67	6.88	7.05	7.21	7.36	7.49	8.04	8.28
	4.39	5.15	5.62	5.97	6.25	6.48	6.67	6.84	6.99	7.13	7.25	7.85	8.08
	4.32	5.05	5.50	5.84	6.10	6.32	6.51	6.67	6.81	6.94	7.06	7.69	7.91
	4.26	4.96	5.40	5.73	5.98	6.19	6.37	6.53	6.67	6.79	6.90	7.55	7.77
	4.21	4.90	5.32	5.63	5.88	6.09	6.26	6.41	6.54	6.66	6.77	7.44	7.65
	4.17	4.84	5.25	5.56	5.80	5.99	6.16	6.31	6.44	6.56	6.66	7.34	7.55
	4.13	4.79	5.19	5.49	5.72	5.92	6.08	6.22	6.35	6.46	6.56	7.25	7.46
	4.10	4.74	5.14	5.43	5.66	5.85	6.01	6.15	6.27	6.38	6.48	7.18	7.38
	4.07	4.70	5.09	5.38	5.60	5.79	5.94	6.08	6.20	6.31	6.41	7.11	7.31
	4.05	4.67	5.05	5.33	5.55	5.74	5.89	6.02	6.14	6.25	6.34	7.05	7.24
	4.02	4.64	5.02	5.29	5.51	5.69	5.84	5.97	6.09	6.19	6.29	6.99	7.19
	3.96	4.55	4.91	5.17	5.37	5.54	5.69	5.81	5.92	6.02	6.11	6.82	7.01
	3.89	4.46	4.80	5.05	5.24	5.40	5.54	5.65	5.76	5.85	5.93	6.65	6.83
	3.83	4.37	4.70	4.93	5.11	5.27	5.39	5.50	5.60	5.69	5.76	6.48	6.65
	3.76	4.28	4.59	4.82	4.99	5.13	5.25	5.36	5.45	5.53	5.60	6.30	6.46
	3.70	4.20	4.50	4.71	4.87	5.01	5.12	5.21	5.30	5.38	5.44	6.13	6.28
	3.64	4.12	4.40	4.60	4.76	4.88	4.99	5.08	5.16	5.23	5.29	5.95	6.09

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Table 6: Critical Values of *r*

df	α = .05, one-tailed -or- α = .10, two-tailed	α = .025, one-tailed -or- α = .05, two-tailed	α = .01, one-tailed -or- α = .02, two-tailed	α = .005, one-tailed -or- α = .01, two-tailed
1	.988	**.997**	1.000	1.000
2	.900	**.950**	.980	.990
3	.805	**.878**	.934	.959
4	.729	**.811**	.882	.917
5	.669	**.754**	.833	.875
6	.621	**.707**	.789	.834
7	.582	**.666**	.750	.798
8	.549	**.632**	.715	.765
9	.521	**.602**	.685	.735
10	.497	**.576**	.658	.708
11	.476	**.553**	.634	.684
12	.458	**.532**	.612	.661
13	.441	**.514**	.592	.641
14	.426	**.497**	.574	.623
15	.412	**.482**	.558	.606
16	.400	**.468**	.543	.590
17	.389	**.456**	.529	.575
18	.378	**.444**	.516	.561
19	.369	**.433**	.503	.549
20	.360	**.423**	.492	.537
21	.352	**.413**	.482	.526
22	.344	**.404**	.472	.515
23	.337	**.396**	.462	.505
24	.330	**.388**	.453	.496
25	.323	**.381**	.445	.487
26	.317	**.374**	.437	.479
27	.311	**.367**	.430	.471
28	.306	**.361**	.423	.463
29	.301	**.355**	.416	.456
30	.296	**.349**	.409	.449
31	.291	**.344**	.403	.442
32	.287	**.339**	.397	.436
33	.283	**.334**	.392	.430
34	.279	**.329**	.386	.424
35	.275	**.325**	.381	.418
36	.271	**.320**	.376	.413
37	.267	**.316**	.371	.408
38	.264	**.312**	.367	.403

df	α = .05, one-tailed -or- α = .10, two-tailed	α = .025, one-tailed -or- α = .05, two-tailed	α = .01, one-tailed -or- α = .02, two-tailed	α = .005, one-tailed -or- α = .01, two-tailed
39	.260	**.308**	.362	.398
40	.257	**.304**	.358	.393
41	.254	**.301**	.354	.389
42	.251	**.297**	.350	.384
43	.248	**.294**	.346	.380
44	.246	**.291**	.342	.376
45	.243	**.288**	.338	.372
46	.240	**.285**	.335	.368
47	.238	**.282**	.331	.365
48	.235	**.279**	.328	.361
49	.233	**.276**	.325	.358
50	.231	**.273**	.322	.354
55	.220	**.261**	.307	.339
60	.211	**.250**	.295	.325
65	.203	**.240**	.284	.313
70	.195	**.232**	.274	.302
75	.189	**.224**	.265	.292
80	.183	**.217**	.257	.283
85	.178	**.211**	.249	.275
90	.173	**.205**	.242	.267
95	.168	**.200**	.236	.260
100	.164	**.195**	.230	.254
120	.150	**.178**	.210	.232
140	.139	**.165**	.195	.216
160	.130	**.154**	.183	.202
180	.122	**.146**	.172	.190
200	.116	**.138**	.164	.181
250	.104	**.124**	.146	.162
300	.095	**.113**	.134	.148
350	.088	**.105**	.124	.137
400	.082	**.098**	.116	.128
450	.077	**.092**	.109	.121
500	.073	**.088**	.104	.115
600	.067	**.080**	.095	.105
700	.062	**.074**	.088	.097
800	.058	**.069**	.082	.091
900	.055	**.065**	.077	.086
1000	.052	**.062**	.073	.081

Table 7: Fisher's *r* to *z* Transformation

First digit of *r*	Second digit of *r*									
	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
.0	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
.1	0.10	0.11	0.12	0.13	0.14	0.15	0.16	0.17	0.18	0.19
.2	0.20	0.21	0.22	0.23	0.24	0.26	0.27	0.28	0.29	0.30
.3	0.31	0.32	0.33	0.34	0.35	0.37	0.38	0.39	0.40	0.41
.4	0.42	0.44	0.45	0.46	0.47	0.48	0.50	0.51	0.52	0.54
.5	0.55	0.56	0.58	0.59	0.60	0.62	0.63	0.65	0.66	0.68
.6	0.69	0.71	0.73	0.74	0.76	0.78	0.79	0.81	0.83	0.85
.7	0.87	0.89	0.91	0.93	0.95	0.97	1.00	1.02	1.05	1.07
.8	1.10	1.13	1.16	1.19	1.22	1.26	1.29	1.33	1.38	1.42
.9	1.47	1.53	1.59	1.66	1.74	1.83	1.95	2.09	2.30	2.65

Table 8: Fisher's *z* to *r* Transformation

First 2 digits of *z* value	Final digit of *z* value									
	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.1	.10	.11	.12	.13	.14	.15	.16	.17	.18	.19
0.2	.20	.21	.22	.23	.24	.24	.25	.26	.27	.28
0.3	.29	.30	.31	.32	.33	.34	.35	.35	.36	.37
0.4	.38	.39	.40	.41	.41	.42	.43	.44	.45	.45
0.5	.46	.47	.48	.49	.49	.50	.51	.52	.52	.53
0.6	.54	.54	.55	.56	.56	.57	.58	.58	.59	.60
0.7	.60	.61	.62	.62	.63	.64	.64	.65	.65	.66
0.8	.66	.67	.68	.68	.69	.69	.70	.70	.71	.71
0.9	.72	.72	.73	.73	.74	.74	.74	.75	.75	.76
1.0	.76	.77	.77	.77	.78	.78	.79	.79	.79	.80
1.1	.80	.80	.81	.81	.81	.82	.82	.82	.83	.83
1.2	.83	.84	.84	.84	.85	.85	.85	.85	.86	.86
1.3	.86	.86	.87	.87	.87	.87	.88	.88	.88	.88
1.4	.89	.89	.89	.89	.89	.90	.90	.90	.90	.90
1.5	.91	.91	.91	.91	.91	.91	.92	.92	.92	.92
1.6	.92	.92	.92	.93	.93	.93	.93	.93	.93	.93
1.7	.94	.94	.94	.94	.94	.94	.94	.94	.94	.95
1.8	.95	.95	.95	.95	.95	.95	.95	.95	.95	.96
1.9	.96	.96	.96	.96	.96	.96	.96	.96	.96	.96
2.0	.96	.96	.97	.97	.97	.97	.97	.97	.97	.97
2.1	.97	.97	.97	.97	.97	.97	.97	.97	.97	.98
2.2	.98	.98	.98	.98	.98	.98	.98	.98	.98	.98
2.3	.98	.98	.98	.98	.98	.98	.98	.98	.98	.98
2.4	.98	.98	.98	.98	.98	.99	.99	.99	.99	.99
2.5	.99	.99	.99	.99	.99	.99	.99	.99	.99	.99
2.6	.99	.99	.99	.99	.99	.99	.99	.99	.99	.99
2.7	.99	.99	.99	.99	.99	.99	.99	.99	.99	.99
2.8	.99	.99	.99	.99	.99	.99	.99	.99	.99	.99
2.9	.99	.99	.99	.99	.99	.99	.99	.99	.99	.99
3.0	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Table 9: Power for a Given *N* and a Given Observed or Hypothesized Correlation Value, $\alpha = .05$, Two-Tailed

N	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50
5	.02	.03	.04	.04	.05	.06	.07	.08	.10	.11
6	.03	.03	.04	.05	.06	.07	.09	.11	.13	.15
7	.03	.03	.04	.06	.07	.08	.10	.13	.16	.19
8	.03	.04	.05	.06	.08	.10	.12	.15	.19	.23
9	.04	.04	.05	.07	.09	.11	.14	.17	.21	.26
10	.03	.04	.05	.07	.09	.12	.16	.20	.24	.30
11	.03	.04	.06	.08	.10	.13	.17	.22	.27	.34
12	.03	.04	.06	.08	.11	.15	.19	.24	.30	.37
13	.03	.05	.06	.09	.12	.16	.21	.26	.33	.41
14	.03	.05	.07	.09	.13	.17	.22	.28	.36	.44
15	.03	.05	.07	.10	.14	.18	.24	.31	.38	.47
16	.03	.05	.07	.10	.14	.19	.26	.33	.41	.50
17	.03	.05	.08	.11	.15	.21	.27	.35	.44	.53
18	.03	.05	.08	.12	.16	.22	.29	.37	.46	.56
19	.03	.05	.08	.12	.17	.23	.30	.39	.49	.59
20	.03	.06	.09	.13	.18	.24	.32	.41	.51	.61
21	.04	.06	.09	.13	.19	.25	.34	.43	.53	.64
22	.04	.06	.09	.14	.19	.27	.35	.45	.56	.66
23	.04	.06	.09	.14	.20	.28	.37	.47	.58	.69
24	.04	.06	.10	.15	.21	.29	.38	.49	.60	.71
25	.04	.06	.10	.15	.22	.30	.40	.51	.62	.73
26	.04	.06	.10	.16	.23	.31	.41	.52	.64	.74
27	.04	.07	.11	.16	.23	.32	.43	.54	.66	.76
28	.04	.07	.11	.17	.24	.34	.44	.56	.67	.78
29	.04	.07	.11	.17	.25	.35	.46	.57	.69	.79
30	.04	.07	.12	.18	.26	.36	.47	.59	.71	.81
32	.04	.07	.12	.19	.27	.38	.50	.62	.74	.84
34	.04	.08	.13	.20	.29	.40	.52	.65	.76	.86
36	.04	.08	.13	.21	.31	.42	.55	.68	.79	.88
38	.04	.08	.14	.22	.32	.44	.58	.70	.81	.90
40	.04	.08	.14	.23	.34	.46	.60	.73	.83	.91
42	.04	.09	.15	.24	.35	.48	.62	.75	.85	.92
44	.05	.09	.16	.25	.37	.50	.64	.77	.87	.94
46	.05	.09	.16	.26	.38	.52	.66	.79	.88	.94
48	.05	.09	.17	.27	.40	.54	.68	.81	.90	.95
50	.05	.10	.17	.28	.41	.56	.70	.82	.91	.96
55	.05	.10	.19	.30	.45	.60	.75	.86	.93	.97
60	.05	.11	.20	.33	.48	.64	.78	.89	.95	.98

NOTE: If cell is blank, power is greater than .99.

Beta (β) = probability of a Type II error = 1 − power.

.55	.60	.65	.70	.75	.80	.85	.90	.95
.13	.16	.19	.23	.27	.34	.42	.54	.73
.18	.22	.26	.32	.39	.47	.58	.72	.88
.23	.28	.34	.41	.49	.59	.70	.83	.95
.28	.34	.41	.49	.58	.69	.80	.90	.98
.32	.39	.47	.56	.66	.76	.86	.95	
.37	.44	.53	.63	.73	.82	.91	.97	
.41	.50	.59	.68	.78	.87	.94	.98	
.45	.54	.64	.73	.83	.90	.96		
.49	.59	.68	.78	.86	.93	.97		
.53	.63	.72	.82	.89	.95	.98		
.57	.67	.76	.85	.92	.96			
.60	.70	.79	.87	.93	.97			
.63	.73	.82	.90	.95	.98			
.66	.76	.85	.91	.96	.98			
.69	.79	.87	.93	.97				
.72	.81	.89	.94	.97				
.74	.83	.90	.95	.98				
.76	.85	.92	.96	.98				
.78	.87	.93	.97					
.80	.88	.94	.97					
.82	.90	.95	.98					
.84	.91	.96	.98					
.85	.92	.96	.98					
.87	.93	.97						
.88	.94	.97						
.89	.94	.98						
.91	.96	.98						
.93	.97							
.94	.97							
.95	.98							
.96	.98							
.97								
.97								
.98								
.98								
.98								

Table 9: Power for a Given *N* and a Given Observed or Hypothesized Correlation Value, $\alpha = .05$, Two-Tailed (continued)

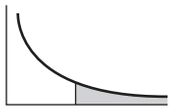
N	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50
65	.05	.12	.22	.35	.52	.68	.82	.91	.96	
70	.06	.12	.23	.38	.55	.71	.84	.93	.97	
75	.06	.13	.24	.40	.58	.74	.87	.94	.98	
80	.06	.14	.26	.42	.61	.77	.89	.96	.98	
85	.06	.14	.27	.45	.63	.80	.91	.96		
90	.06	.15	.29	.47	.66	.82	.92	.97		
95	.06	.15	.30	.49	.68	.84	.93	.98		
100	.07	.16	.31	.51	.71	.86	.94	.98		
110	.07	.17	.34	.55	.75	.89	.96			
120	.07	.19	.37	.59	.78	.91	.97			
130	.08	.20	.39	.62	.82	.93	.98			
140	.08	.21	.42	.66	.84	.95	.98			
150	.08	.22	.44	.69	.87	.96				
160	.09	.24	.47	.71	.89	.97				
170	.09	.25	.49	.74	.90	.97				
180	.09	.26	.52	.76	.92	.98				
190	.10	.27	.54	.79	.93	.98				
200	.10	.29	.56	.81	.94					
220	.11	.31	.60	.84	.96					
240	.11	.33	.64	.87	.97					
260	.12	.36	.67	.90	.98					
280	.12	.38	.71	.92	.98					
300	.13	.40	.74	.93						
400	.16	.51	.85	.98						
500	.19	.60	.92							
600	.23	.68	.95							
700	.26	.75	.97							
800	.29	.80	.98							
900	.32	.85								
1000	.35	.88								
1500	.49	.97								
2000	.60									
3000	.78									
4000	.88									
5000	.94									
6000	.97									
7000	.98									
8000										

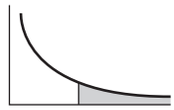
NOTE: If cell is blank, power is greater than .99.
Beta (β) = probability of a Type II error = 1 − power.

	.55	.60	.65	.70	.75	.80	.85	.90	.95

Calculated via nQuery Advisor, 5.0.

Table 10: Critical Values of Chi-Square





	α level				α level		
df	.10	.05	.001	*df*	.10	.05	.001
1	2.706	**3.841**	10.828	24	33.196	**36.415**	51.179
2	4.605	**5.991**	13.816	25	34.382	**37.652**	52.620
3	6.251	**7.815**	16.266	26	35.563	**38.885**	54.052
4	7.779	**9.488**	18.467	27	36.741	**40.113**	55.476
5	9.236	**11.070**	20.515	28	37.916	**41.337**	56.892
6	10.645	**12.592**	22.458	29	39.087	**42.557**	58.301
7	12.017	**14.067**	24.322	30	40.256	**43.773**	59.703
8	13.362	**15.507**	26.124	31	41.422	**44.985**	61.098
9	14.684	**16.919**	27.877	32	42.585	**46.194**	62.487
10	15.987	**18.307**	29.588	33	43.745	**47.400**	63.870
11	17.275	**19.675**	31.264	34	44.903	**48.602**	65.247
12	18.549	**21.026**	32.909	35	46.059	**49.802**	66.619
13	19.812	**22.362**	34.528	36	47.212	**50.998**	67.985
14	21.064	**23.685**	36.123	37	48.363	**52.192**	69.346
15	22.307	**24.996**	37.697	38	49.513	**53.384**	70.703
16	23.542	**26.296**	39.252	39	50.660	**54.572**	72.055
17	24.769	**27.587**	40.790	40	51.805	**55.758**	73.402
18	25.989	**28.869**	42.312	41	52.949	**56.942**	74.745
19	27.204	**30.144**	43.820	42	54.090	**58.124**	76.084
20	28.412	**31.410**	45.315	43	55.230	**59.304**	77.419
21	29.615	**32.671**	46.797	44	56.369	**60.481**	78.750
22	30.813	**33.924**	48.268	45	57.505	**61.656**	80.077
23	32.007	**35.172**	49.728				