

Statistical Tables

TABLE A Binomial distributions: Tabled are probabilities of the form $P(X = k)$, where X is a random variable having the binomial(n, p) distribution for specified sample size n and probability of success p . [This table omits some probabilities that are zero to four decimal places. Because of rounding, listed probabilities for some distributions may not sum exactly to 1. Probabilities were calculated using the Student Edition of Minitab (Schaefer and Anderson, 1989).]

$n = 2$

$p = .05$ k	$P(X = k)$	$p = .95$ k	$p = .1$ k	$P(X = k)$	$p = .9$ k	$p = .2$ k	$P(X = k)$	$p = .8$ k
0	.9025	2	0	.8100	2	0	.6400	2
1	.0950	1	1	.1800	1	1	.3200	1
2	.0025	0	2	.0100	0	2	.0400	0

$p = .3$ k	$P(X = k)$	$p = .7$ k	$p = .4$ k	$P(X = k)$	$p = .6$ k	$p = .5$ k	$P(X = k)$
0	.4900	2	0	.3600	2	0	.2500
1	.4200	1	1	.4800	1	1	.5000
2	.0900	0	2	.1600	0	2	.2500

$n = 3$

$p = .05$ k	$P(X = k)$	$p = .95$ k	$p = .1$ k	$P(X = k)$	$p = .9$ k	$p = .2$ k	$P(X = k)$	$p = .8$ k
0	.8574	3	0	.7290	3	0	.5120	3
1	.1354	2	1	.2430	2	1	.3840	2
2	.0071	1	2	.0270	1	2	.0960	1
3	.0001	0	3	.0010	0	3	.0080	0

$p = .3$ k	$P(X = k)$	$p = .7$ k	$p = .4$ k	$P(X = k)$	$p = .6$ k	$p = .5$ k	$P(X = k)$
0	.3430	3	0	.2160	3	0	.1250
1	.4410	2	1	.4320	2	1	.3750
2	.1890	1	2	.2880	1	2	.3750
3	.0270	0	3	.0640	0	3	.1250

(continued)

TABLE A (continued)

 $n = 4$

$p = .05$ k	$P(X = k)$	$p = .95$ k	$p = .1$ k	$P(X = k)$	$p = .9$ k	$p = .2$ k	$P(X = k)$	$p = .8$ k
0	.8145	4	0	.6561	4	0	.4096	4
1	.1715	3	1	.2916	3	1	.4096	3
2	.0135	2	2	.0486	2	2	.1536	2
3	.0005	1	3	.0036	1	3	.0256	1
4	.0000	0	4	.0001	0	4	.0016	0

$p = .3$ k	$P(X = k)$	$p = .7$ k	$p = .4$ k	$P(X = k)$	$p = .6$ k	$p = .5$ k	$P(X = k)$
0	.2401	4	0	.1296	4	0	.0625
1	.4116	3	1	.3456	3	1	.2500
2	.2646	2	2	.3456	2	2	.3750
3	.0756	1	3	.1536	1	3	.2500
4	.0081	0	4	.0256	0	4	.0625

 $n = 5$

$p = .05$ k	$P(X = k)$	$p = .95$ k	$p = .1$ k	$P(X = k)$	$p = .9$ k	$p = .2$ k	$P(X = k)$	$p = .8$ k
0	.7738	5	0	.5905	5	0	.3277	5
1	.2036	4	1	.3281	4	1	.4096	4
2	.0214	3	2	.0729	3	2	.2048	3
3	.0011	2	3	.0081	2	3	.0512	2
4	.0000	1	4	.0005	1	4	.0064	1
5	.0000	0	5	.0000	0	5	.0003	0

$p = .3$ k	$P(X = k)$	$p = .7$ k	$p = .4$ k	$P(X = k)$	$p = .6$ k	$p = .5$ k	$P(X = k)$
0	.1681	5	0	.0778	5	0	.0313
1	.3601	4	1	.2592	4	1	.1562
2	.3087	3	2	.3456	3	2	.3125
3	.1323	2	3	.2304	2	3	.3125
4	.0284	1	4	.0768	1	4	.1562
5	.0024	0	5	.0102	0	5	.0313

TABLE A (continued)

***n* = 6**

$p = .05$ <i>k</i>	$P(X = k)$	$p = .95$ <i>k</i>	$p = .1$ <i>k</i>	$P(X = k)$	$p = .9$ <i>k</i>	$p = .2$ <i>k</i>	$P(X = k)$	$p = .8$ <i>k</i>
0	.7351	6	0	.5314	6	0	.2621	6
1	.2321	5	1	.3543	5	1	.3932	5
2	.0305	4	2	.0984	4	2	.2458	4
3	.0021	3	3	.0146	3	3	.0819	3
4	.0001	2	4	.0012	2	4	.0154	2
5	.0000	1	5	.0001	1	5	.0015	1
6	.0000	0	6	.0000	0	6	.0001	0

$p = .3$ <i>k</i>	$P(X = k)$	$p = .7$ <i>k</i>	$p = .4$ <i>k</i>	$P(X = k)$	$p = .6$ <i>k</i>	$p = .5$ <i>k</i>	$P(X = k)$
0	.1176	6	0	.0467	6	0	.0156
1	.3025	5	1	.1866	5	1	.0937
2	.3241	4	2	.3110	4	2	.2344
3	.1852	3	3	.2765	3	3	.3125
4	.0595	2	4	.1382	2	4	.2344
5	.0102	1	5	.0369	1	5	.0937
6	.0007	0	6	.0041	0	6	.0156

***n* = 7**

$p = .05$ <i>k</i>	$P(X = k)$	$p = .95$ <i>k</i>	$p = .1$ <i>k</i>	$P(X = k)$	$p = .9$ <i>k</i>	$p = .2$ <i>k</i>	$P(X = k)$	$p = .8$ <i>k</i>
0	.6983	7	0	.4783	7	0	.2097	7
1	.2573	6	1	.3720	6	1	.3670	6
2	.0406	5	2	.1240	5	2	.2753	5
3	.0036	4	3	.0230	4	3	.1147	4
4	.0002	3	4	.0026	3	4	.0287	3
5	.0000	2	5	.0002	2	5	.0043	2
6	.0000	1	6	.0000	1	6	.0004	1
7	.0000	0	7	.0000	0	7	.0000	0

$p = .3$ <i>k</i>	$P(X = k)$	$p = .7$ <i>k</i>	$p = .4$ <i>k</i>	$P(X = k)$	$p = .6$ <i>k</i>	$p = .5$ <i>k</i>	$P(X = k)$
0	.0824	7	0	.0280	7	0	.0078
1	.2471	6	1	.1306	6	1	.0547
2	.3177	5	2	.2613	5	2	.1641
3	.2269	4	3	.2903	4	3	.2734
4	.0972	3	4	.1935	3	4	.2734
5	.0250	2	5	.0774	2	5	.1641
6	.0036	1	6	.0172	1	6	.0547
7	.0002	0	7	.0016	0	7	.0078

(continued)

TABLE A (continued)

 $n = 8$

$p = .05$	$P(X = k)$	$p = .95$	$p = .1$	$P(X = k)$	$p = .9$	$p = .2$	$P(X = k)$	$p = .8$
k		k	k		k	k		k
0	.6634	8	0	.4305	8	0	.1678	8
1	.2793	7	1	.3826	7	1	.3355	7
2	.0515	6	2	.1488	6	2	.2936	6
3	.0054	5	3	.0331	5	3	.1468	5
4	.0004	4	4	.0046	4	4	.0459	4
5	.0000	3	5	.0004	3	5	.0092	3
6	.0000	2	6	.0000	2	6	.0011	2
7	.0000	1	7	.0000	1	7	.0001	1
8	.0000	0	8	.0000	0	8	.0000	0

$p = .3$	$P(X = k)$	$p = .7$	$p = .4$	$P(X = k)$	$p = .6$	$p = .5$	$P(X = k)$
k		k	k		k	k	
0	.0576	8	0	.0168	8	0	.0039
1	.1977	7	1	.0896	7	1	.0313
2	.2965	6	2	.2090	6	2	.1094
3	.2541	5	3	.2787	5	3	.2187
4	.1361	4	4	.2322	4	4	.2734
5	.0467	3	5	.1239	3	5	.2187
6	.0100	2	6	.0413	2	6	.1094
7	.0012	1	7	.0079	1	7	.0313
8	.0001	0	8	.0007	0	8	.0039

 $n = 9$

$p = .05$	$P(X = k)$	$p = .95$	$p = .1$	$P(X = k)$	$p = .9$	$p = .2$	$P(X = k)$	$p = .8$
k		k	k		k	k		k
0	.6302	9	0	.3874	9	0	.1342	9
1	.2985	8	1	.3874	8	1	.3020	8
2	.0629	7	2	.1722	7	2	.3020	7
3	.0077	6	3	.0446	6	3	.1762	6
4	.0006	5	4	.0074	5	4	.0661	5
5	.0000	4	5	.0008	4	5	.0165	4
6	.0000	3	6	.0001	3	6	.0028	3
7	.0000	2	7	.0000	2	7	.0003	2
8	.0000	1	8	.0000	1	8	.0000	1

TABLE A (continued)

$p = .3$ k	$P(X = k)$	$p = .7$ k	$p = .4$ k	$P(X = k)$	$p = .6$ k	$p = .5$ k	$P(X = k)$
0	.0404	9	0	.0101	9	0	.0020
1	.1556	8	1	.0605	8	1	.0176
2	.2668	7	2	.1612	7	2	.0703
3	.2668	6	3	.2508	6	3	.1641
4	.1715	5	4	.2508	5	4	.2461
5	.0735	4	5	.1672	4	5	.2461
6	.0210	3	6	.0743	3	6	.1641
7	.0039	2	7	.0212	2	7	.0703
8	.0004	1	8	.0035	1	8	.0176
9	.0000	0	9	.0003	0	9	.0020

$n = 10$

$p = .05$ k	$P(X = k)$	$p = .95$ k	$p = .1$ k	$P(X = k)$	$p = .9$ k	$p = .2$ k	$P(X = k)$	$p = .8$ k
0	.5987	10	0	.3487	10	0	.1074	10
1	.3151	9	1	.3874	9	1	.2684	9
2	.0746	8	2	.1937	8	2	.3020	8
3	.0105	7	3	.0574	7	3	.2013	7
4	.0010	6	4	.0112	6	4	.0881	6
5	.0001	5	5	.0015	5	5	.0264	5
6	.0000	4	6	.0001	4	6	.0055	4
7	.0000	3	7	.0000	3	7	.0008	3
8	.0000	2	8	.0000	2	8	.0001	2
9	.0000	1	9	.0000	1	9	.0000	1

$p = .3$ k	$P(X = k)$	$p = .7$ k	$p = .4$ k	$P(X = k)$	$p = .6$ k	$p = .5$ k	$P(X = k)$
0	.0282	10	0	.0060	10	0	.0010
1	.1211	9	1	.0403	9	1	.0098
2	.2335	8	2	.1209	8	2	.0439
3	.2668	7	3	.2150	7	3	.1172
4	.2001	6	4	.2508	6	4	.2051
5	.1029	5	5	.2007	5	5	.2461
6	.0368	4	6	.1115	4	6	.2051
7	.0090	3	7	.0425	3	7	.1172
8	.0014	2	8	.0106	2	8	.0439
9	.0001	1	9	.0016	1	9	.0098
10	.0000	0	10	.0001	0	10	.0010

(continued)

TABLE A (continued)

 $n = 15$

$p = .05$ k	$P(X = k)$	$p = .95$ k	$p = .1$ k	$P(X = k)$	$p = .9$ k	$p = .2$ k	$P(X = k)$	$p = .8$ k
0	.4633	15	0	.2059	15	0	.0352	15
1	.3658	14	1	.3432	14	1	.1319	14
2	.1348	13	2	.2669	13	2	.2309	13
3	.0307	12	3	.1285	12	3	.2501	12
4	.0049	11	4	.0428	11	4	.1876	11
5	.0006	10	5	.0105	10	5	.1032	10
6	.0000	9	6	.0019	9	6	.0430	9
7	.0000	8	7	.0003	8	7	.0138	8
8	.0000	7	8	.0000	7	8	.0035	7
9	.0000	6	9	.0000	6	9	.0007	6
10	.0000	5	10	.0000	5	10	.0001	5
11	.0000	4	11	.0000	4	11	.0000	4

$p = .3$ k	$P(X = k)$	$p = .7$ k	$p = .4$ k	$P(X = k)$	$p = .6$ k	$p = .5$ k	$P(X = k)$
0	.0047	15	0	.0005	15	0	.0000
1	.0305	14	1	.0047	14	1	.0005
2	.0916	13	2	.0219	13	2	.0032
3	.1700	12	3	.0634	12	3	.0139
4	.2186	11	4	.1268	11	4	.0417
5	.2061	10	5	.1859	10	5	.0916
6	.1472	9	6	.2066	9	6	.1527
7	.0811	8	7	.1771	8	7	.1964
8	.0348	7	8	.1181	7	8	.1964
9	.0116	6	9	.0612	6	9	.1527
10	.0030	5	10	.0245	5	10	.0916
11	.0006	4	11	.0074	4	11	.0417
12	.0001	3	12	.0016	3	12	.0139
13	.0000	2	13	.0003	2	13	.0032
14	.0000	1	14	.0000	1	14	.0005
15	.0000	0	15	.0000	0	15	.0000

TABLE A (continued)
 $n = 20$

$p = .05$	$P(X = k)$	$p = .95$	$p = .1$	$P(X = k)$	$p = .9$	$p = .2$	$P(X = k)$	$p = .8$
k		k	k		k	k		k
0	.3585	20	0	.1216	20	0	.0115	20
1	.3774	19	1	.2702	19	1	.0576	19
2	.1887	18	2	.2852	18	2	.1369	18
3	.0596	17	3	.1901	17	3	.2054	17
4	.0133	16	4	.0898	16	4	.2182	16
5	.0022	15	5	.0319	15	5	.1746	15
6	.0003	14	6	.0089	14	6	.1091	14
7	.0000	13	7	.0020	13	7	.0545	13
8	.0000	12	8	.0004	12	8	.0222	12
9	.0000	11	9	.0001	11	9	.0074	11
10	.0000	10	10	.0000	10	10	.0020	10
11	.0000	9	11	.0000	9	11	.0005	9
12	.0000	8	12	.0000	8	12	.0001	8
13	.0000	7	13	.0000	7	13	.0000	7

$p = .3$	$P(X = k)$	$p = .7$	$p = .4$	$P(X = k)$	$p = .6$	$p = .5$	$P(X = k)$
k		k	k		k	k	
0	.0008	20	0	.0000	20	0	.0000
1	.0068	19	1	.0005	19	1	.0000
2	.0278	18	2	.0031	18	2	.0002
3	.0716	17	3	.0123	17	3	.0011
4	.1304	16	4	.0350	16	4	.0046
5	.1789	15	5	.0746	15	5	.0148
6	.1916	14	6	.1244	14	6	.0370
7	.1643	13	7	.1659	13	7	.0739
8	.1144	12	8	.1797	12	8	.1201
9	.0654	11	9	.1597	11	9	.1602
10	.0308	10	10	.1171	10	10	.1762
11	.0120	9	11	.0710	9	11	.1602
12	.0039	8	12	.0355	8	12	.1201
13	.0010	7	13	.0146	7	13	.0739
14	.0002	6	14	.0049	6	14	.0370
15	.0000	5	15	.0013	5	15	.0148
16	.0000	4	16	.0003	4	16	.0046
17	.0000	3	17	.0000	3	17	.0011
18	.0000	2	18	.0000	2	18	.0002
19	.0000	1	19	.0000	1	19	.0000

TABLE B Cumulative standard Gaussian (normal) distribution. Tabled are cumulative probabilities of the form $P(Z \leq c)$, where c is a nonnegative number and Z has the standard Gaussian distribution.



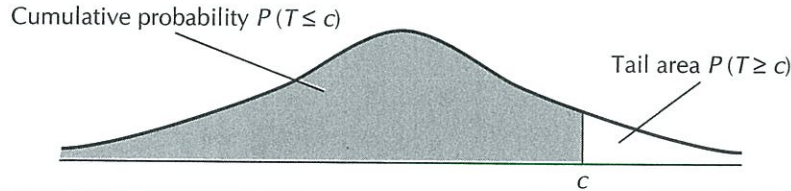
c	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
.0	.5000	.5040	.5080	.5120	.5160	.5199	.5239	.5279	.5319	.5359
.1	.5398	.5438	.5478	.5517	.5557	.5596	.5636	.5675	.5714	.5753
.2	.5793	.5832	.5871	.5910	.5948	.5987	.6026	.6064	.6103	.6141
.3	.6179	.6217	.6255	.6293	.6331	.6368	.6406	.6443	.6480	.6517
.4	.6554	.6591	.6628	.6664	.6700	.6736	.6772	.6808	.6844	.6879
.5	.6915	.6950	.6985	.7019	.7054	.7088	.7123	.7157	.7190	.7224
.6	.7257	.7291	.7324	.7357	.7389	.7422	.7454	.7486	.7517	.7549
.7	.7580	.7611	.7642	.7673	.7704	.7734	.7764	.7794	.7823	.7852
.8	.7881	.7910	.7939	.7967	.7995	.8023	.8051	.8078	.8106	.8133
.9	.8159	.8186	.8212	.8238	.8264	.8289	.8315	.8340	.8365	.8389
1.0	.8413	.8438	.8461	.8485	.8508	.8531	.8554	.8577	.8599	.8621
1.1	.8643	.8665	.8686	.8708	.8729	.8749	.8770	.8790	.8810	.8830
1.2	.8849	.8869	.8888	.8907	.8925	.8944	.8962	.8980	.8997	.9015
1.3	.9032	.9049	.9066	.9082	.9099	.9115	.9131	.9147	.9162	.9177
1.4	.9192	.9207	.9222	.9236	.9251	.9265	.9279	.9292	.9306	.9319
1.5	.9332	.9345	.9357	.9370	.9382	.9394	.9406	.9418	.9429	.9441
1.6	.9452	.9463	.9474	.9484	.9495	.9505	.9515	.9525	.9535	.9545
1.7	.9554	.9564	.9573	.9582	.9591	.9599	.9608	.9616	.9625	.9633
1.8	.9641	.9649	.9656	.9664	.9671	.9678	.9686	.9693	.9699	.9706
1.9	.9713	.9719	.9726	.9732	.9738	.9744	.9750	.9756	.9761	.9767
2.0	.9772	.9778	.9783	.9788	.9793	.9798	.9803	.9808	.9812	.9817
2.1	.9821	.9826	.9830	.9834	.9838	.9842	.9846	.9850	.9854	.9857
2.2	.9861	.9864	.9868	.9871	.9875	.9878	.9881	.9884	.9887	.9890
2.3	.9893	.9896	.9898	.9901	.9904	.9906	.9909	.9911	.9913	.9916
2.4	.9918	.9920	.9922	.9925	.9927	.9929	.9931	.9932	.9934	.9936
2.5	.9938	.9940	.9941	.9943	.9945	.9946	.9948	.9949	.9951	.9952
2.6	.9953	.9955	.9956	.9957	.9959	.9960	.9961	.9962	.9963	.9964
2.7	.9965	.9966	.9967	.9968	.9969	.9970	.9971	.9972	.9973	.9974
2.8	.9974	.9975	.9976	.9977	.9977	.9978	.9979	.9979	.9980	.9981
2.9	.9981	.9982	.9982	.9983	.9984	.9984	.9985	.9985	.9986	.9986
3.0	.9987	.9987	.9987	.9988	.9988	.9989	.9989	.9989	.9990	.9990
3.1	.9990	.9991	.9991	.9991	.9992	.9992	.9992	.9992	.9993	.9993
3.2	.9993	.9993	.9994	.9994	.9994	.9994	.9994	.9995	.9995	.9995
3.3	.9995	.9995	.9995	.9996	.9996	.9996	.9996	.9996	.9996	.9997
3.4	.9997	.9997	.9997	.9997	.9997	.9997	.9997	.9997	.9997	.9998

Note: $P(Z \leq -c) = P(Z \geq c)$
 $= 1 - P(Z \leq c)$

Example: $P(Z \leq 1.96) = .9750$
 $P(Z \leq -1.96) = P(Z \geq 1.96)$
 $= .0250$

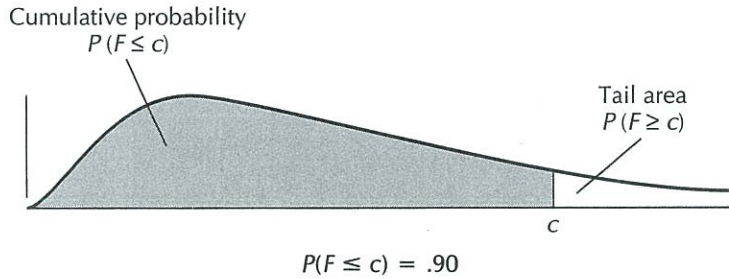
From Table 2 of *Mathematical Statistics and Data Analysis* by John A. Rice, Wadsworth & Brooks/Cole, 1988, page 558.

TABLE C Values of c corresponding to cumulative probabilities $P(T \leq c)$ and tail areas $P(T \geq c)$, where T has a t distribution.



Cumulative probability Tail area	.60 .40	.70 .30	.80 .20	.90 .10	.95 .05	.975 .025	.99 .01	.995 .005
Degrees of freedom								
1	.325	.727	1.376	3.078	6.314	12.706	31.821	63.657
2	.289	.617	1.061	1.886	2.920	4.303	6.965	9.925
3	.277	.584	.978	1.638	2.353	3.182	4.541	5.841
4	.271	.569	.941	1.533	2.132	2.776	3.747	4.604
5	.267	.559	.920	1.476	2.015	2.571	3.365	4.032
6	.265	.553	.906	1.440	1.943	2.447	3.143	3.707
7	.263	.549	.896	1.415	1.895	2.365	2.998	3.499
8	.262	.546	.889	1.397	1.860	2.306	2.896	3.355
9	.261	.543	.883	1.383	1.833	2.262	2.821	3.250
10	.260	.542	.879	1.372	1.812	2.228	2.764	3.169
11	.260	.540	.876	1.363	1.796	2.201	2.718	3.106
12	.259	.539	.873	1.356	1.782	2.179	2.681	3.055
13	.259	.538	.870	1.350	1.771	2.160	2.650	3.012
14	.258	.537	.868	1.345	1.761	2.145	2.624	2.977
15	.258	.536	.866	1.341	1.753	2.131	2.602	2.947
16	.258	.535	.865	1.337	1.746	2.120	2.583	2.921
17	.257	.534	.863	1.333	1.740	2.110	2.567	2.898
18	.257	.534	.862	1.330	1.734	2.101	2.552	2.878
19	.257	.533	.861	1.328	1.729	2.093	2.539	2.861
20	.257	.533	.860	1.325	1.725	2.086	2.528	2.845
21	.257	.532	.859	1.323	1.721	2.080	2.518	2.831
22	.256	.532	.858	1.321	1.717	2.074	2.508	2.819
23	.256	.532	.858	1.319	1.714	2.069	2.500	2.807
24	.256	.531	.857	1.318	1.711	2.064	2.492	2.797
25	.256	.531	.856	1.316	1.708	2.060	2.485	2.787
26	.256	.531	.856	1.315	1.706	2.056	2.479	2.779
27	.256	.531	.855	1.314	1.703	2.052	2.473	2.771
28	.256	.530	.855	1.313	1.701	2.048	2.467	2.763
29	.256	.530	.854	1.311	1.699	2.045	2.462	2.756
30	.256	.530	.854	1.310	1.697	2.042	2.457	2.750
40	.255	.529	.851	1.303	1.684	2.021	2.423	2.704
60	.254	.527	.848	1.296	1.671	2.000	2.390	2.660
120	.254	.526	.845	1.289	1.658	1.980	2.358	2.617
∞	.253	.524	.842	1.282	1.645	1.960	2.326	2.576

From Table 4 of *Mathematical Statistics and Data Analysis* by John A. Rice, Wadsworth & Brooks/Cole, 1988, page 560.

TABLE D Values of c corresponding to cumulative probabilities $P(F \leq c)$, where F has an F distribution. d_1 = degrees of freedom for numerator

$d_2 \backslash d_1$	1	2	3	4	5	6	7	8	9
1	39.86	49.50	53.59	55.83	57.24	58.20	58.91	59.44	59.86
2	8.53	9.00	9.16	9.24	9.29	9.33	9.35	9.37	9.38
3	5.54	5.46	5.39	5.34	5.31	5.28	5.27	5.25	5.24
4	4.54	4.32	4.19	4.11	4.05	4.01	3.98	3.95	3.94
5	4.06	3.78	3.62	3.52	3.45	3.40	3.37	3.34	3.32
6	3.78	3.46	3.29	3.18	3.11	3.05	3.01	2.98	2.96
7	3.59	3.26	3.07	2.96	2.88	2.83	2.78	2.75	2.72
8	3.46	3.11	2.92	2.81	2.73	2.67	2.62	2.59	2.56
9	3.36	3.01	2.81	2.69	2.61	2.55	2.51	2.47	2.44
10	3.29	2.92	2.73	2.61	2.52	2.46	2.41	2.38	2.35
11	3.23	2.86	2.66	2.54	2.45	2.39	2.34	2.30	2.27
12	3.18	2.81	2.61	2.48	2.39	2.33	2.28	2.24	2.21
13	3.14	2.76	2.56	2.43	2.35	2.28	2.23	2.20	2.16
14	3.10	2.73	2.52	2.39	2.31	2.24	2.19	2.15	2.12
15	3.07	2.70	2.49	2.36	2.27	2.21	2.16	2.12	2.09
16	3.05	2.67	2.46	2.33	2.24	2.18	2.13	2.09	2.06
17	3.03	2.64	2.44	2.31	2.22	2.15	2.10	2.06	2.03
18	3.01	2.62	2.42	2.29	2.20	2.13	2.08	2.04	2.00
19	2.99	2.61	2.40	2.27	2.18	2.11	2.06	2.02	1.98
20	2.97	2.59	2.38	2.25	2.16	2.09	2.04	2.00	1.96
21	2.96	2.57	2.36	2.23	2.14	2.08	2.02	1.98	1.95
22	2.95	2.56	2.35	2.22	2.13	2.06	2.01	1.97	1.93
23	2.94	2.55	2.34	2.21	2.11	2.05	1.99	1.95	1.92
24	2.93	2.54	2.33	2.19	2.10	2.04	1.98	1.94	1.91
25	2.92	2.53	2.32	2.18	2.09	2.02	1.97	1.93	1.89
26	2.91	2.52	2.31	2.17	2.08	2.01	1.96	1.92	1.88
27	2.90	2.51	2.30	2.17	2.07	2.00	1.95	1.91	1.87
28	2.89	2.50	2.29	2.16	2.06	2.00	1.94	1.90	1.87
29	2.89	2.50	2.28	2.15	2.06	1.99	1.93	1.89	1.86
30	2.88	2.49	2.28	2.14	2.05	1.98	1.93	1.88	1.85
40	2.84	2.44	2.23	2.09	2.00	1.93	1.87	1.83	1.79
60	2.79	2.39	2.18	2.04	1.95	1.87	1.82	1.77	1.74
120	2.75	2.35	2.13	1.99	1.90	1.82	1.77	1.72	1.68
∞	2.71	2.30	2.08	1.94	1.85	1.77	1.72	1.67	1.63

From Table 5 of *Mathematical Statistics and Data Analysis* by John A. Rice, Wadsworth & Brooks/Cole, 1988, pages 561–564.

TABLE D (continued)

10	12	15	20	24	30	40	60	120	∞
60.19	60.71	61.22	61.74	62.00	62.26	62.53	62.79	63.06	63.33
9.39	9.41	9.42	9.44	9.45	9.46	9.47	9.47	9.48	9.49
5.23	5.22	5.20	5.18	5.18	5.17	5.16	5.15	5.14	5.13
3.92	3.90	3.87	3.84	3.83	3.82	3.80	3.79	3.78	3.76
3.30	3.27	3.24	3.21	3.19	3.17	3.16	3.14	3.12	3.10
2.94	2.90	2.87	2.84	2.82	2.80	2.78	2.76	2.74	2.72
2.70	2.67	2.63	2.59	2.58	2.56	2.54	2.51	2.49	2.47
2.50	2.50	2.46	2.42	2.40	2.38	2.36	2.34	2.32	2.29
2.42	2.38	2.34	2.30	2.28	2.25	2.23	2.21	2.18	2.16
2.32	2.28	2.24	2.20	2.18	2.16	2.13	2.11	2.08	2.06
2.25	2.21	2.17	2.12	2.10	2.08	2.05	2.03	2.00	1.97
2.19	2.15	2.10	2.06	2.04	2.01	1.99	1.96	1.93	1.90
2.14	2.10	2.05	2.01	1.98	1.96	1.93	1.90	1.88	1.85
2.10	2.05	2.01	1.96	1.94	1.91	1.89	1.86	1.83	1.80
2.06	2.02	1.97	1.92	1.90	1.87	1.85	1.82	1.79	1.76
2.03	1.99	1.94	1.89	1.87	1.84	1.81	1.78	1.75	1.72
2.00	1.96	1.91	1.86	1.84	1.81	1.78	1.75	1.72	1.69
1.98	1.93	1.89	1.84	1.81	1.78	1.75	1.72	1.69	1.66
1.96	1.91	1.86	1.81	1.79	1.76	1.73	1.70	1.67	1.63
1.94	1.89	1.84	1.79	1.77	1.74	1.71	1.68	1.64	1.61
1.92	1.87	1.83	1.78	1.75	1.72	1.69	1.66	1.62	1.59
1.90	1.86	1.81	1.76	1.73	1.70	1.67	1.64	1.60	1.57
1.89	1.84	1.80	1.74	1.72	1.69	1.66	1.62	1.59	1.55
1.88	1.83	1.78	1.73	1.70	1.67	1.64	1.61	1.57	1.53
1.87	1.82	1.77	1.72	1.69	1.66	1.63	1.59	1.56	1.52
1.86	1.81	1.76	1.71	1.68	1.65	1.61	1.58	1.54	1.50
1.85	1.80	1.75	1.70	1.67	1.64	1.60	1.57	1.53	1.49
1.84	1.79	1.74	1.69	1.66	1.63	1.59	1.56	1.52	1.48
1.83	1.78	1.73	1.68	1.65	1.62	1.58	1.55	1.51	1.47
1.82	1.77	1.72	1.67	1.64	1.61	1.57	1.54	1.50	1.46
1.76	1.71	1.66	1.61	1.57	1.54	1.51	1.47	1.42	1.38
1.71	1.66	1.60	1.54	1.51	1.48	1.44	1.40	1.35	1.29
1.65	1.60	1.55	1.48	1.45	1.41	1.37	1.32	1.26	1.19
1.60	1.55	1.49	1.42	1.38	1.34	1.30	1.24	1.17	1.00

(continued)

TABLE D (continued)

$$P(F \leq c) = .95$$

 d_1 = degrees of freedom for numerator

$d_2 \backslash d_1$	1	2	3	4	5	6	7	8	9
1	161.4	199.5	215.7	224.6	230.2	234.0	236.8	238.9	240.5
2	18.51	19.00	19.16	19.25	19.30	19.33	19.35	19.37	19.38
3	10.13	9.55	9.28	9.12	9.01	8.94	8.89	8.85	8.81
4	7.71	6.94	6.59	6.39	6.26	6.16	6.09	6.04	6.00
5	6.61	5.79	5.41	5.19	5.05	4.95	4.88	4.82	4.77
6	5.99	5.14	4.76	4.53	4.39	4.28	4.21	4.15	4.10
7	5.59	4.74	4.35	4.12	3.97	3.87	3.79	3.73	3.68
8	5.32	4.46	4.07	3.84	3.69	3.58	3.50	3.44	3.39
9	5.12	4.26	3.86	3.63	3.48	3.37	3.29	3.23	3.18
10	4.96	4.10	3.71	3.48	3.33	3.22	3.14	3.07	3.02
11	4.84	3.98	3.59	3.36	3.20	3.09	3.01	2.95	2.90
12	4.75	3.89	3.49	3.26	3.11	3.00	2.91	2.85	2.80
13	4.67	3.81	3.41	3.18	3.03	2.92	2.83	2.77	2.71
14	4.60	3.74	3.34	3.11	2.96	2.85	2.76	2.70	2.65
15	4.54	3.68	3.29	3.06	2.90	2.79	2.71	2.64	2.59
16	4.49	3.63	3.24	3.01	2.85	2.74	2.66	2.59	2.54
17	4.45	3.59	3.20	2.96	2.81	2.70	2.61	2.55	2.49
18	4.41	3.55	3.16	2.93	2.77	2.66	2.58	2.51	2.46
19	4.38	3.52	3.13	2.90	2.74	2.63	2.54	2.48	2.42
20	4.35	3.49	3.10	2.87	2.71	2.60	2.51	2.45	2.39
21	4.32	3.47	3.07	2.84	2.68	2.57	2.49	2.42	2.37
22	4.30	3.44	3.05	2.82	2.66	2.55	2.46	2.40	2.34
23	4.28	3.42	3.03	2.80	2.64	2.53	2.44	2.37	2.32
24	4.26	3.40	3.01	2.78	2.62	2.51	2.42	2.36	2.30
25	4.24	3.39	2.99	2.76	2.60	2.49	2.40	2.34	2.28
26	4.23	3.37	2.98	2.74	2.59	2.47	2.39	2.32	2.27
27	4.21	3.35	2.96	2.73	2.57	2.46	2.37	2.31	2.25
28	4.20	3.34	2.95	2.71	2.56	2.45	2.36	2.29	2.24
29	4.18	3.33	2.93	2.70	2.55	2.43	2.35	2.28	2.22
30	4.17	3.32	2.92	2.69	2.53	2.42	2.33	2.27	2.21
40	4.08	3.23	2.84	2.61	2.45	2.34	2.25	2.18	2.12
60	4.00	3.15	2.76	2.53	2.37	2.25	2.17	2.10	2.04
120	3.92	3.07	2.68	2.45	2.29	2.17	2.09	2.02	1.96
∞	3.84	3.00	2.60	2.37	2.21	2.10	2.01	1.94	1.88

 d_2 = degrees of freedom for denominator

TABLE D (continued)

10	12	15	20	24	30	40	60	120	∞
241.9	243.9	245.9	248.0	249.1	250.1	251.1	252.2	253.3	254.3
19.40	19.41	19.43	19.45	19.45	19.46	19.47	19.48	19.49	19.50
8.79	8.74	8.70	8.66	8.64	8.62	8.59	8.57	8.55	8.53
5.96	5.91	5.86	5.80	5.77	5.75	5.72	5.69	5.66	5.63
4.74	4.68	4.62	4.56	4.53	4.50	4.46	4.43	4.40	4.36
4.06	4.00	3.94	3.87	3.84	3.81	3.77	3.74	3.70	3.67
3.64	3.57	3.51	3.44	3.41	3.38	3.34	3.30	3.27	3.23
3.35	3.28	3.22	3.15	3.12	3.08	3.04	3.01	2.97	2.93
3.14	3.07	3.01	2.94	2.90	2.86	2.83	2.79	2.75	2.71
2.98	2.91	2.85	2.77	2.74	2.70	2.66	2.62	2.58	2.54
2.85	2.79	2.72	2.65	2.61	2.57	2.53	2.49	2.45	2.40
2.75	2.69	2.62	2.54	2.51	2.47	2.43	2.38	2.34	2.30
2.67	2.60	2.53	2.46	2.42	2.38	2.34	2.30	2.25	2.21
2.60	2.53	2.46	2.39	2.35	2.31	2.27	2.22	2.18	2.13
2.54	2.48	2.40	2.33	2.29	2.25	2.20	2.16	2.11	2.07
2.49	2.42	2.35	2.28	2.24	2.19	2.15	2.11	2.06	2.01
2.45	2.38	2.31	2.23	2.19	2.15	2.10	2.06	2.01	1.96
2.41	2.34	2.27	2.19	2.15	2.11	2.06	2.02	1.97	1.92
2.38	2.31	2.23	2.16	2.11	2.07	2.03	1.98	1.93	1.88
2.35	2.28	2.20	2.12	2.08	2.04	1.99	1.95	1.90	1.84
2.32	2.25	2.18	2.10	2.05	2.01	1.96	1.92	1.87	1.81
2.30	2.23	2.15	2.07	2.03	1.98	1.94	1.89	1.84	1.78
2.27	2.20	2.13	2.05	2.01	1.96	1.91	1.86	1.81	1.76
2.25	2.18	2.11	2.03	1.98	1.94	1.89	1.84	1.79	1.73
2.24	2.16	2.09	2.01	1.96	1.92	1.87	1.82	1.77	1.71
2.22	2.15	2.07	1.99	1.95	1.90	1.85	1.80	1.75	1.69
2.20	2.13	2.06	1.97	1.93	1.88	1.84	1.79	1.73	1.67
2.19	2.12	2.04	1.96	1.91	1.87	1.82	1.77	1.71	1.65
2.18	2.10	2.03	1.94	1.90	1.85	1.81	1.75	1.70	1.64
2.16	2.09	2.01	1.93	1.89	1.84	1.79	1.74	1.68	1.62
2.08	2.00	1.92	1.84	1.79	1.74	1.69	1.64	1.58	1.51
1.99	1.92	1.84	1.75	1.70	1.65	1.59	1.53	1.47	1.39
1.91	1.83	1.75	1.66	1.61	1.55	1.50	1.43	1.35	1.25
1.83	1.75	1.67	1.57	1.52	1.46	1.39	1.32	1.22	1.00

(continued)

TABLE D (continued)

$$P(F \leq c) = .975$$

 d_1 = degrees of freedom for numerator

$d_2 \backslash d_1$	1	2	3	4	5	6	7	8	9
1	647.8	799.5	864.2	899.6	921.8	937.1	948.2	956.7	963.3
2	38.51	39.00	39.17	39.25	39.30	39.33	39.36	39.37	39.39
3	17.44	16.04	15.44	15.10	14.88	14.73	14.62	14.54	14.47
4	12.22	10.65	9.98	9.60	9.36	9.20	9.07	8.98	8.90
5	10.01	8.43	7.76	7.39	7.15	6.98	6.85	6.76	6.68
6	8.81	7.26	6.60	6.23	5.99	5.82	5.70	5.60	5.52
7	8.07	6.54	5.89	5.52	5.29	5.12	4.99	4.90	4.82
8	7.57	6.06	5.42	5.05	4.82	4.65	4.53	4.43	4.36
9	7.21	5.71	5.08	4.72	4.48	4.32	4.20	4.10	4.03
10	6.94	5.46	4.83	4.47	4.24	4.07	3.95	3.85	3.78
11	6.72	5.26	4.63	4.28	4.04	3.88	3.76	3.66	3.59
12	6.55	5.10	4.47	4.12	3.89	3.73	3.61	3.51	3.44
13	6.41	4.97	4.35	4.00	3.77	3.60	3.48	3.39	3.31
14	6.30	4.86	4.24	3.89	3.66	3.50	3.38	3.29	3.21
15	6.20	4.77	4.15	3.80	3.58	3.41	3.29	3.20	3.12
16	6.12	4.69	4.08	3.73	3.50	3.34	3.22	3.12	3.05
17	6.04	4.62	4.01	3.66	3.44	3.28	3.16	3.06	2.98
18	5.98	4.56	3.95	3.61	3.38	3.22	3.10	3.01	2.93
19	5.92	4.51	3.90	3.56	3.33	3.17	3.05	2.96	2.88
20	5.87	4.46	3.86	3.51	3.29	3.13	3.01	2.91	2.84
21	5.83	4.42	3.82	3.48	3.25	3.09	2.97	2.87	2.80
22	5.79	4.38	3.78	3.44	3.22	3.05	2.93	2.84	2.76
23	5.75	4.35	3.75	3.41	3.18	3.02	2.90	2.81	2.73
24	5.72	4.32	3.72	3.38	3.15	2.99	2.87	2.78	2.70
25	5.69	4.29	3.69	3.35	3.13	2.97	2.85	2.75	2.68
26	5.66	4.27	3.67	3.33	3.10	2.94	2.82	2.73	2.65
27	5.63	4.24	3.65	3.31	3.08	2.92	2.80	2.71	2.63
28	5.61	4.22	3.63	3.29	3.06	2.90	2.78	2.69	2.61
29	5.59	4.20	3.61	3.27	3.04	2.88	2.76	2.67	2.59
30	5.57	4.18	3.59	3.25	3.03	2.87	2.75	2.65	2.57
40	5.42	4.05	3.46	3.13	2.90	2.74	2.62	2.53	2.45
60	5.29	3.93	3.34	3.01	2.79	2.63	2.51	2.41	2.33
120	5.15	3.80	3.23	2.89	2.67	2.52	2.39	2.30	2.22
∞	5.02	3.69	3.12	2.79	2.57	2.41	2.29	2.19	2.11

 d_2 = degrees of freedom for denominator

TABLE D (continued)

10	12	15	20	24	30	40	60	120	∞
968.6	976.7	984.9	993.1	997.2	1001	1006	1010	1014	1018
39.40	39.41	39.43	39.45	39.46	39.46	39.47	39.48	39.49	39.50
14.42	14.34	14.25	14.17	14.12	14.08	14.04	13.99	13.95	13.90
8.84	8.75	8.66	8.56	8.51	8.46	8.41	8.36	8.31	8.26
6.62	6.52	6.43	6.33	6.28	6.23	6.18	6.12	6.07	6.02
5.46	5.37	5.27	5.17	5.12	5.07	5.01	4.96	4.90	4.85
4.76	4.67	4.57	4.47	4.42	4.36	4.31	4.25	4.20	4.14
4.30	4.20	4.10	4.00	3.95	3.89	3.84	3.78	3.73	3.67
3.96	3.87	3.77	3.67	3.61	3.56	3.51	3.45	3.39	3.33
3.72	3.62	3.52	3.42	3.37	3.31	3.26	3.20	3.14	3.08
3.53	3.43	3.33	3.23	3.17	3.12	3.06	3.00	2.94	2.88
3.37	3.28	3.18	3.07	3.02	2.96	2.91	2.85	2.79	2.72
3.25	3.15	3.05	2.95	2.89	2.84	2.78	2.72	2.66	2.60
3.15	3.05	2.95	2.84	2.79	2.73	2.67	2.61	2.55	2.49
3.06	2.96	2.86	2.76	2.70	2.64	2.59	2.52	2.46	2.40
2.99	2.89	2.79	2.68	2.63	2.57	2.51	2.45	2.38	2.32
2.92	2.82	2.72	2.62	2.56	2.50	2.44	2.38	2.32	2.25
2.87	2.77	2.67	2.56	2.50	2.44	2.38	2.32	2.26	2.19
2.82	2.72	2.62	2.51	2.45	2.39	2.33	2.27	2.20	2.13
2.77	2.68	2.57	2.46	2.41	2.35	2.29	2.22	2.16	2.09
2.73	2.64	2.53	2.42	2.37	2.31	2.25	2.18	2.11	2.04
2.70	2.60	2.50	2.39	2.33	2.27	2.21	2.14	2.08	2.00
2.67	2.57	2.47	2.36	2.30	2.24	2.18	2.11	2.04	1.97
2.64	2.54	2.44	2.33	2.27	2.21	2.15	2.08	2.01	1.94
2.61	2.51	2.41	2.30	2.24	2.18	2.12	2.05	1.98	1.91
2.59	2.49	2.39	2.28	2.22	2.16	2.09	2.03	1.95	1.88
2.57	2.47	2.36	2.25	2.19	2.13	2.07	2.00	1.93	1.85
2.55	2.45	2.34	2.23	2.17	2.11	2.05	1.98	1.91	1.83
2.53	2.43	2.32	2.21	2.15	2.09	2.03	1.96	1.89	1.81
2.51	2.41	2.31	2.20	2.14	2.07	2.01	1.94	1.87	1.79
2.39	2.29	2.18	2.07	2.01	1.94	1.88	1.80	1.72	1.64
2.27	2.17	2.06	1.94	1.88	1.82	1.74	1.67	1.58	1.48
2.16	2.05	1.94	1.82	1.76	1.69	1.61	1.53	1.43	1.31
2.05	1.94	1.83	1.71	1.64	1.57	1.48	1.39	1.27	1.00

(continued)

TABLE D (continued)

$$P(F \leq c) = .99$$

 d_1 = degrees of freedom for numerator

$d_2 \backslash d_1$	1	2	3	4	5	6	7	8	9
1	4052	4999.5	5403	5625	5764	5859	5928	5982	6022
2	98.50	99.00	99.17	99.25	99.30	99.33	99.36	99.37	99.39
3	34.12	30.82	29.46	28.71	28.24	27.91	27.67	27.49	27.35
4	21.20	18.00	16.69	15.98	15.52	15.21	14.98	14.80	14.66
5	16.26	13.27	12.06	11.39	10.97	10.67	10.46	10.29	10.16
6	13.75	10.92	9.78	9.15	8.75	8.47	8.26	8.10	7.98
7	12.25	9.55	8.45	7.85	7.46	7.19	6.99	6.84	6.72
8	11.26	8.65	7.59	7.01	6.63	6.37	6.18	6.03	5.91
9	10.56	8.02	6.99	6.42	6.06	5.80	5.61	5.47	5.35
10	10.04	7.56	6.55	5.99	5.64	5.39	5.20	5.06	4.94
11	9.65	7.21	6.22	5.67	5.32	5.07	4.89	4.74	4.63
12	9.33	6.93	5.95	5.41	5.06	4.82	4.64	4.50	4.39
13	9.07	6.70	5.74	5.21	4.86	4.62	4.44	4.30	4.19
14	8.86	6.51	5.56	5.04	4.69	4.46	4.28	4.14	4.03
15	8.68	6.36	5.42	4.89	4.56	4.32	4.14	4.00	3.89
16	8.53	6.23	5.29	4.77	4.44	4.20	4.03	3.89	3.78
17	8.40	6.11	5.18	4.67	4.34	4.10	3.93	3.79	3.68
18	8.29	6.01	5.09	4.58	4.25	4.01	3.84	3.71	3.60
19	8.18	5.93	5.01	4.50	4.17	3.94	3.77	3.63	3.52
20	8.10	5.85	4.94	4.43	4.10	3.87	3.70	3.56	3.46
21	8.02	5.78	4.87	4.37	4.04	3.81	3.64	3.51	3.40
22	7.95	5.72	4.82	4.31	3.99	3.76	3.59	3.45	3.35
23	7.88	5.66	4.76	4.26	3.94	3.71	3.54	3.41	3.30
24	7.82	5.61	4.72	4.22	3.90	3.67	3.50	3.36	3.26
25	7.77	5.57	4.68	4.18	3.85	3.63	3.46	3.32	3.22
26	7.72	5.53	4.64	4.14	3.82	3.59	3.42	3.29	3.18
27	7.68	5.49	4.60	4.11	3.78	3.56	3.39	3.26	3.15
28	7.64	5.45	4.57	4.07	3.75	3.53	3.36	3.23	3.12
29	7.60	5.42	4.54	4.04	3.73	3.50	3.33	3.20	3.09
30	7.56	5.39	4.51	4.02	3.70	3.47	3.30	3.17	3.07
40	7.31	5.18	4.31	3.83	3.51	3.29	3.12	2.99	2.89
60	7.08	4.98	4.13	3.65	3.34	3.12	2.95	2.82	2.72
120	6.85	4.79	3.95	3.48	3.17	2.96	2.79	2.66	2.56
∞	6.63	4.61	3.78	3.32	3.02	2.80	2.64	2.51	2.41

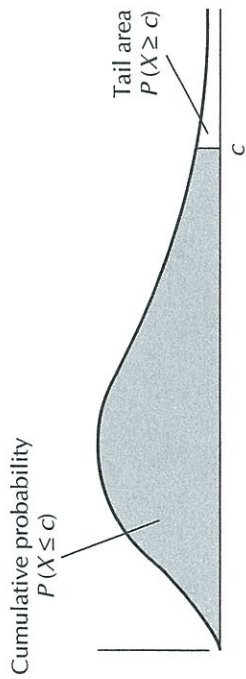
 d_2 = degrees of freedom for denominator

TABLE D (continued)

10	12	15	20	24	30	40	60	120	∞
6056	6106	6157	6209	6235	6261	6287	6313	6339	6366
99.40	99.42	99.43	99.45	99.46	99.47	99.47	99.48	99.49	99.50
27.23	27.05	26.87	26.69	26.60	26.50	26.41	26.32	26.22	26.13
14.55	14.37	14.20	14.02	13.93	13.84	13.75	13.65	13.56	13.46
10.05	9.89	9.72	9.55	9.47	9.38	9.29	9.20	9.11	9.02
7.87	7.72	7.56	7.40	7.31	7.23	7.14	7.06	6.97	6.88
6.62	6.47	6.31	6.16	6.07	5.99	5.91	5.82	5.74	5.65
5.81	5.67	5.52	5.36	5.28	5.20	5.12	5.03	4.95	4.86
5.26	5.11	4.96	4.81	4.73	4.65	4.57	4.48	4.40	4.31
4.85	4.71	4.56	4.41	4.33	4.25	4.17	4.08	4.00	3.91
4.54	4.40	4.25	4.10	4.02	3.94	3.86	3.78	3.69	3.60
4.30	4.16	4.01	3.86	3.78	3.70	3.62	3.54	3.45	3.36
4.10	3.96	3.82	3.66	3.59	3.51	3.43	3.34	3.25	3.17
3.94	3.80	3.66	3.51	3.43	3.35	3.27	3.18	3.09	3.00
3.80	3.67	3.52	3.37	3.29	3.21	3.13	3.05	2.96	2.87
3.69	3.55	3.41	3.26	3.18	3.10	3.02	2.93	2.84	2.75
3.59	3.46	3.31	3.16	3.08	3.00	2.92	2.83	2.75	2.65
3.51	3.37	3.23	3.08	3.00	2.92	2.84	2.75	2.66	2.57
3.43	3.30	3.15	3.00	2.92	2.84	2.76	2.67	2.58	2.49
3.37	3.23	3.09	2.94	2.86	2.78	2.69	2.61	2.52	2.42
3.31	3.17	3.03	2.88	2.80	2.72	2.64	2.55	2.46	2.36
3.26	3.12	2.98	2.83	2.75	2.67	2.58	2.50	2.40	2.31
3.21	3.07	2.93	2.78	2.70	2.62	2.54	2.45	2.35	2.26
3.17	3.03	2.89	2.74	2.66	2.58	2.49	2.40	2.31	2.21
3.13	2.99	2.85	2.70	2.62	2.54	2.45	2.36	2.27	2.17
3.09	2.96	2.81	2.66	2.58	2.50	2.42	2.33	2.23	2.13
3.06	2.93	2.78	2.63	2.55	2.47	2.38	2.29	2.20	2.10
3.03	2.90	2.75	2.60	2.52	2.44	2.35	2.26	2.17	2.06
3.00	2.87	2.73	2.57	2.49	2.41	2.33	2.23	2.14	2.03
2.98	2.84	2.70	2.55	2.47	2.39	2.30	2.21	2.11	2.01
2.80	2.66	2.52	2.37	2.29	2.20	2.11	2.02	1.92	1.80
2.63	2.50	2.35	2.20	2.12	2.03	1.94	1.84	1.73	1.60
2.47	2.34	2.19	2.03	1.95	1.86	1.76	1.66	1.53	1.38
2.32	2.18	2.04	1.88	1.79	1.70	1.59	1.47	1.32	1.00

(continued)

TABLE E Values of c corresponding to cumulative probabilities $P(X \leq c)$ and tail areas $P(X \geq c)$, where X has a chi-square distribution



Cumulative probability Tail area	Degrees of freedom											
	.005 .995	.01 .99	.025 .975	.05 .95	.10 .90	.20 .80	.30 .70	.40 .60	.50 .50	.75 .25	.95 .05	.99 .01
1	.000039	.00016	.00098	.0039	.0158	.271	3.84	5.02	6.63	7.88		
2	.0100	.0201	.0506	.1026	.2107	4.61	5.99	7.38	9.21	10.60		
3	.0717	.115	.216	.352	.584	6.25	7.81	9.35	11.34	12.84		
4	.207	.297	.484	.711	1.064	7.78	9.49	11.14	13.28	14.86		
5	.412	.554	.831	1.15	1.61	9.24	11.07	12.83	15.09	16.75		
6	.676	.872	1.24	1.64	2.20	10.64	12.59	14.45	16.81	18.55		
7	.989	1.24	1.69	2.17	2.83	12.02	14.07	16.01	18.48	20.28		
8	1.34	1.65	2.18	2.73	3.49	13.36	15.51	17.53	20.09	21.96		
9	1.73	2.09	2.70	3.33	4.17	14.68	16.92	19.02	21.67	23.59		
10	2.16	2.56	3.25	3.94	4.87	15.99	18.31	20.48	23.21	25.19		
11	2.60	3.05	3.82	4.57	5.58	17.28	19.68	21.92	24.73	26.76		
12	3.07	3.57	4.40	5.23	6.30	18.55	21.03	23.34	26.22	28.30		
13	3.57	4.11	5.01	5.89	7.04	19.81	22.36	24.74	27.69	29.82		
14	4.07	4.66	5.63	6.57	7.79	21.06	23.68	26.12	29.14	31.32		
15	4.60	5.23	6.26	7.26	8.55	22.31	25.00	27.49	30.58	32.80		
16	5.14	5.81	6.91	7.96	9.31	23.54	26.30	28.85	32.00	34.27		
18	6.26	7.01	8.23	9.39	10.86	25.99	28.87	31.53	34.81	37.16		
20	7.43	8.26	9.59	10.85	12.44	28.41	31.41	34.17	37.57	40.00		
24	9.89	10.86	12.40	13.85	15.66	33.20	36.42	39.36	42.98	45.56		
30	13.79	14.95	16.79	18.49	20.60	40.26	43.77	46.98	50.89	53.67		
40	20.71	22.16	24.43	26.51	29.05	51.81	55.76	59.34	63.69	66.77		
60	35.53	37.48	40.48	43.19	46.46	74.40	79.08	83.30	88.38	91.95		
120	83.85	86.92	91.58	95.70	100.62	140.23	146.57	152.21	158.95	163.64		

From Table 3 of *Mathematical Statistics and Data Analysis* by John A. Rice, Wadsworth & Brooks/Cole, 1988, page 559.