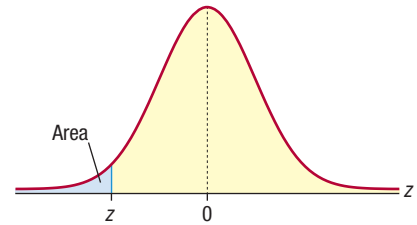


# Appendix A

## Statistical Tables

### A Standard Normal Distribution

Numerical entries represent the probability that a standard normal random variable is between  $-\infty$  and  $z$  where  $z = \frac{x - \mu}{\sigma}$ .

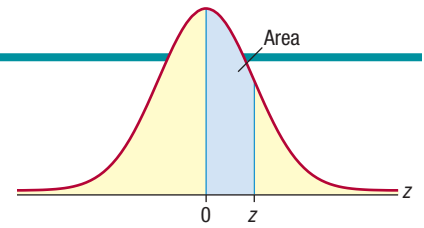


<i>z</i>	0.09	0.08	0.07	0.06	0.05	0.04	0.03	0.02	0.01	0.00
-3.4	0.0002	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003
-3.3	0.0003	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0005	0.0005	0.0005
-3.2	0.0005	0.0005	0.0005	0.0006	0.0006	0.0006	0.0006	0.0006	0.0007	0.0007
-3.1	0.0007	0.0007	0.0008	0.0008	0.0008	0.0008	0.0009	0.0009	0.0009	0.0010
-3.0	0.0010	0.0010	0.0011	0.0011	0.0011	0.0012	0.0012	0.0013	0.0013	0.0013
-2.9	0.0014	0.0014	0.0015	0.0015	0.0016	0.0016	0.0017	0.0018	0.0018	0.0019
-2.8	0.0019	0.0020	0.0021	0.0021	0.0022	0.0023	0.0023	0.0024	0.0025	0.0026
-2.7	0.0026	0.0027	0.0028	0.0029	0.0030	0.0031	0.0032	0.0033	0.0034	0.0035
-2.6	0.0036	0.0037	0.0038	0.0039	0.0040	0.0041	0.0043	0.0044	0.0045	0.0047
-2.5	0.0048	0.0049	0.0051	0.0052	0.0054	0.0055	0.0057	0.0059	0.0060	0.0062
-2.4	0.0064	0.0066	0.0068	0.0069	0.0071	0.0073	0.0075	0.0078	0.0080	0.0082
-2.3	0.0084	0.0087	0.0089	0.0091	0.0094	0.0096	0.0099	0.0102	0.0104	0.0107
-2.2	0.0110	0.0113	0.0116	0.0119	0.0122	0.0125	0.0129	0.0132	0.0136	0.0139
-2.1	0.0143	0.0146	0.0150	0.0154	0.0158	0.0162	0.0166	0.0170	0.0174	0.0179
-2.0	0.0183	0.0188	0.0192	0.0197	0.0202	0.0207	0.0212	0.0217	0.0222	0.0228
-1.9	0.0233	0.0239	0.0244	0.0250	0.0256	0.0262	0.0268	0.0274	0.0281	0.0287
-1.8	0.0294	0.0301	0.0307	0.0314	0.0322	0.0329	0.0336	0.0344	0.0351	0.0359
-1.7	0.0367	0.0375	0.0384	0.0392	0.0401	0.0409	0.0418	0.0427	0.0436	0.0446
-1.6	0.0455	0.0465	0.0475	0.0485	0.0495	0.0505	0.0516	0.0526	0.0537	0.0548
-1.5	0.0559	0.0571	0.0582	0.0594	0.0606	0.0618	0.0630	0.0643	0.0655	0.0668
-1.4	0.0681	0.0694	0.0708	0.0721	0.0735	0.0749	0.0764	0.0778	0.0793	0.0808
-1.3	0.0823	0.0838	0.0853	0.0869	0.0885	0.0901	0.0918	0.0934	0.0951	0.0968
-1.2	0.0985	0.1003	0.1020	0.1038	0.1056	0.1075	0.1093	0.1112	0.1131	0.1151
-1.1	0.1170	0.1190	0.1210	0.1230	0.1251	0.1271	0.1292	0.1314	0.1335	0.1357
-1.0	0.1379	0.1401	0.1423	0.1446	0.1469	0.1492	0.1515	0.1539	0.1562	0.1587
-0.9	0.1611	0.1635	0.1660	0.1685	0.1711	0.1736	0.1762	0.1788	0.1814	0.1841
-0.8	0.1867	0.1894	0.1922	0.1949	0.1977	0.2005	0.2033	0.2061	0.2090	0.2119
-0.7	0.2148	0.2177	0.2206	0.2236	0.2266	0.2296	0.2327	0.2358	0.2389	0.2420
-0.6	0.2451	0.2483	0.2514	0.2546	0.2578	0.2611	0.2643	0.2676	0.2709	0.2743
-0.5	0.2776	0.2810	0.2843	0.2877	0.2912	0.2946	0.2981	0.3015	0.3050	0.3085
-0.4	0.3121	0.3156	0.3192	0.3228	0.3264	0.3300	0.3336	0.3372	0.3409	0.3446
-0.3	0.3483	0.3520	0.3557	0.3594	0.3632	0.3669	0.3707	0.3745	0.3783	0.3821
-0.2	0.3859	0.3897	0.3936	0.3974	0.4013	0.4052	0.4090	0.4129	0.4168	0.4207
-0.1	0.4247	0.4286	0.4325	0.4364	0.4404	0.4443	0.4483	0.4522	0.4562	0.4602
-0.0	0.4641	0.4681	0.4721	0.4761	0.4801	0.4840	0.4880	0.4920	0.4960	0.5000



# C Standard Normal Distribution

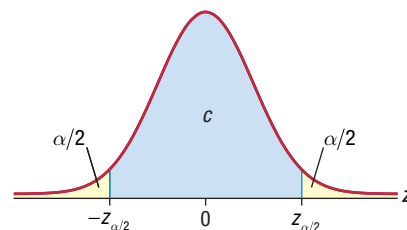
Numerical entries represent the probability that a standard normal random variable is between 0 and  $z$  where  $z = \frac{x - \mu}{\sigma}$ .



<b>z</b>	<b>0.00</b>	<b>0.01</b>	<b>0.02</b>	<b>0.03</b>	<b>0.04</b>	<b>0.05</b>	<b>0.06</b>	<b>0.07</b>	<b>0.08</b>	<b>0.09</b>
<b>0.0</b>	0.0000	0.0040	0.0080	0.0120	0.0160	0.0199	0.0239	0.0279	0.0319	0.0359
<b>0.1</b>	0.0398	0.0438	0.0478	0.0517	0.0557	0.0596	0.0636	0.0675	0.0714	0.0753
<b>0.2</b>	0.0793	0.0832	0.0871	0.0910	0.0948	0.0987	0.1026	0.1064	0.1103	0.1141
<b>0.3</b>	0.1179	0.1217	0.1255	0.1293	0.1331	0.1368	0.1406	0.1443	0.1480	0.1517
<b>0.4</b>	0.1554	0.1591	0.1628	0.1664	0.1700	0.1736	0.1772	0.1808	0.1844	0.1879
<b>0.5</b>	0.1915	0.1950	0.1985	0.2019	0.2054	0.2088	0.2123	0.2157	0.2190	0.2224
<b>0.6</b>	0.2257	0.2291	0.2324	0.2357	0.2389	0.2422	0.2454	0.2486	0.2517	0.2549
<b>0.7</b>	0.2580	0.2611	0.2642	0.2673	0.2704	0.2734	0.2764	0.2794	0.2823	0.2852
<b>0.8</b>	0.2881	0.2910	0.2939	0.2967	0.2995	0.3023	0.3051	0.3078	0.3106	0.3133
<b>0.9</b>	0.3159	0.3186	0.3212	0.3238	0.3264	0.3289	0.3315	0.3340	0.3365	0.3389
<b>1.0</b>	0.3413	0.3438	0.3461	0.3485	0.3508	0.3531	0.3554	0.3577	0.3599	0.3621
<b>1.1</b>	0.3643	0.3665	0.3686	0.3708	0.3729	0.3749	0.3770	0.3790	0.3810	0.3830
<b>1.2</b>	0.3849	0.3869	0.3888	0.3907	0.3925	0.3944	0.3962	0.3980	0.3997	0.4015
<b>1.3</b>	0.4032	0.4049	0.4066	0.4082	0.4099	0.4115	0.4131	0.4147	0.4162	0.4177
<b>1.4</b>	0.4192	0.4207	0.4222	0.4236	0.4251	0.4265	0.4279	0.4292	0.4306	0.4319
<b>1.5</b>	0.4332	0.4345	0.4357	0.4370	0.4382	0.4394	0.4406	0.4418	0.4429	0.4441
<b>1.6</b>	0.4452	0.4463	0.4474	0.4484	0.4495	0.4505	0.4515	0.4525	0.4535	0.4545
<b>1.7</b>	0.4554	0.4564	0.4573	0.4582	0.4591	0.4599	0.4608	0.4616	0.4625	0.4633
<b>1.8</b>	0.4641	0.4649	0.4656	0.4664	0.4671	0.4678	0.4686	0.4693	0.4699	0.4706
<b>1.9</b>	0.4713	0.4719	0.4726	0.4732	0.4738	0.4744	0.4750	0.4756	0.4761	0.4767
<b>2.0</b>	0.4772	0.4778	0.4783	0.4788	0.4793	0.4798	0.4803	0.4808	0.4812	0.4817
<b>2.1</b>	0.4821	0.4826	0.4830	0.4834	0.4838	0.4842	0.4846	0.4850	0.4854	0.4857
<b>2.2</b>	0.4861	0.4864	0.4868	0.4871	0.4875	0.4878	0.4881	0.4884	0.4887	0.4890
<b>2.3</b>	0.4893	0.4896	0.4898	0.4901	0.4904	0.4906	0.4909	0.4911	0.4913	0.4916
<b>2.4</b>	0.4918	0.4920	0.4922	0.4925	0.4927	0.4929	0.4931	0.4932	0.4934	0.4936
<b>2.5</b>	0.4938	0.4940	0.4941	0.4943	0.4945	0.4946	0.4948	0.4949	0.4951	0.4952
<b>2.6</b>	0.4953	0.4955	0.4956	0.4957	0.4959	0.4960	0.4961	0.4962	0.4963	0.4964
<b>2.7</b>	0.4965	0.4966	0.4967	0.4968	0.4969	0.4970	0.4971	0.4972	0.4973	0.4974
<b>2.8</b>	0.4974	0.4975	0.4976	0.4977	0.4977	0.4978	0.4979	0.4979	0.4980	0.4981
<b>2.9</b>	0.4981	0.4982	0.4982	0.4983	0.4984	0.4984	0.4985	0.4985	0.4986	0.4986
<b>3.0</b>	0.4987	0.4987	0.4987	0.4988	0.4988	0.4989	0.4989	0.4989	0.4990	0.4990
<b>3.1</b>	0.4990	0.4991	0.4991	0.4991	0.4992	0.4992	0.4992	0.4992	0.4993	0.4993
<b>3.2</b>	0.4993	0.4993	0.4994	0.4994	0.4994	0.4994	0.4994	0.4995	0.4995	0.4995
<b>3.3</b>	0.4995	0.4995	0.4995	0.4996	0.4996	0.4996	0.4996	0.4996	0.4996	0.4997
<b>3.4</b>	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4998

## Critical Values of z

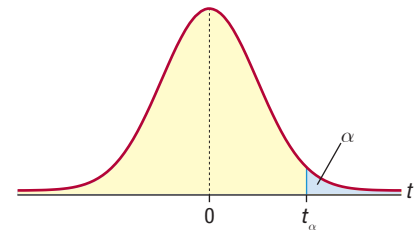
<b>Confidence Level (1-<math>\alpha</math>)</b>	<b><math>z_{\alpha/2}</math></b>
0.80	1.28
0.90	1.645
0.95	1.96
0.99	2.575



## D Critical Values of $t$

Numerical entries represent the value of  $t$  such that the area to the right of the  $t$  is equal to  $\alpha$ .

Degrees of Freedom	Area to the Right of the Critical Value					
	$t_{0.200}$	$t_{0.100}$	$t_{0.050}$	$t_{0.025}$	$t_{0.010}$	$t_{0.005}$
1	1.376	3.078	6.314	12.706	31.821	63.657
2	1.061	1.886	2.920	4.303	6.965	9.925
3	0.978	1.638	2.353	3.182	4.541	5.841
4	0.941	1.533	2.132	2.776	3.747	4.604
5	0.920	1.476	2.015	2.571	3.365	4.032
6	0.906	1.440	1.943	2.447	3.143	3.707
7	0.896	1.415	1.895	2.365	2.998	3.499
8	0.889	1.397	1.860	2.306	2.896	3.355
9	0.883	1.383	1.833	2.262	2.821	3.250
10	0.879	1.372	1.812	2.228	2.764	3.169
11	0.876	1.363	1.796	2.201	2.718	3.106
12	0.873	1.356	1.782	2.179	2.681	3.055
13	0.870	1.350	1.771	2.160	2.650	3.012
14	0.868	1.345	1.761	2.145	2.624	2.977
15	0.866	1.341	1.753	2.131	2.602	2.947
16	0.865	1.337	1.746	2.120	2.583	2.921
17	0.863	1.333	1.740	2.110	2.567	2.898
18	0.862	1.330	1.734	2.101	2.552	2.878
19	0.861	1.328	1.729	2.093	2.539	2.861
20	0.860	1.325	1.725	2.086	2.528	2.845
21	0.859	1.323	1.721	2.080	2.518	2.831
22	0.858	1.321	1.717	2.074	2.508	2.819
23	0.858	1.319	1.714	2.069	2.500	2.807
24	0.857	1.318	1.711	2.064	2.492	2.797
25	0.856	1.316	1.708	2.060	2.485	2.787
26	0.856	1.315	1.706	2.056	2.479	2.779
27	0.855	1.314	1.703	2.052	2.473	2.771
28	0.855	1.313	1.701	2.048	2.467	2.763
29	0.854	1.311	1.699	2.045	2.462	2.756
30	0.854	1.310	1.697	2.042	2.457	2.750
40	0.851	1.303	1.684	2.021	2.423	2.704
50	0.849	1.299	1.676	2.009	2.403	2.678
60	0.848	1.296	1.671	2.000	2.390	2.660
70	0.847	1.294	1.667	1.994	2.381	2.648
80	0.846	1.292	1.664	1.990	2.374	2.639
90	0.846	1.291	1.662	1.987	2.368	2.632
100	0.845	1.290	1.660	1.984	2.364	2.626
120	0.845	1.289	1.658	1.980	2.358	2.617
$\infty$	0.842	1.282	1.645	1.96	2.326	2.576











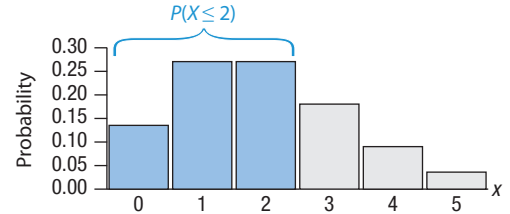






# F Cumulative Poisson Probabilities

Numerical entries represent  $P(X \leq x)$ .



x	$\lambda$											
	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.10	0.20	0.30	0.40
0	0.9802	0.9704	0.9608	0.9512	0.9418	0.9324	0.9231	0.9139	0.9048	0.8187	0.7408	0.6703
1	0.9998	0.9996	0.9992	0.9988	0.9983	0.9977	0.9970	0.9962	0.9953	0.9825	0.9631	0.9384
2	1.0000	1.0000	1.0000	1.0000	1.0000	0.9999	0.9999	0.9999	0.9998	0.9989	0.9964	0.9921
3	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.9999	0.9997	0.9992
4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.9999
5	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
x	0.50	0.60	0.70	0.80	0.90	1.00	1.10	1.20	1.30	1.40	1.50	1.60
0	0.6065	0.5488	0.4966	0.4493	0.4066	0.3679	0.3329	0.3012	0.2725	0.2466	0.2231	0.2019
1	0.9098	0.8781	0.8442	0.8088	0.7725	0.7358	0.6990	0.6626	0.6268	0.5918	0.5578	0.5249
2	0.9856	0.9769	0.9659	0.9526	0.9371	0.9197	0.9004	0.8795	0.8571	0.8335	0.8088	0.7834
3	0.9982	0.9966	0.9942	0.9909	0.9865	0.9810	0.9743	0.9662	0.9569	0.9463	0.9344	0.9212
4	0.9998	0.9996	0.9992	0.9986	0.9977	0.9963	0.9946	0.9923	0.9893	0.9857	0.9814	0.9763
5	1.0000	1.0000	0.9999	0.9998	0.9997	0.9994	0.9990	0.9985	0.9978	0.9968	0.9955	0.9940
6	1.0000	1.0000	1.0000	1.0000	1.0000	0.9999	0.9999	0.9997	0.9996	0.9994	0.9991	0.9987
7	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.9999	0.9999	0.9998	0.9997
8	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
x	1.70	1.80	1.90	2.00	2.10	2.20	2.30	2.40	2.50	2.60	2.70	2.80
0	0.1827	0.1653	0.1496	0.1353	0.1225	0.1108	0.1003	0.0907	0.0821	0.0743	0.0672	0.0608
1	0.4932	0.4628	0.4337	0.4060	0.3796	0.3546	0.3309	0.3084	0.2873	0.2674	0.2487	0.2311
2	0.7572	0.7306	0.7037	0.6767	0.6496	0.6227	0.5960	0.5697	0.5438	0.5184	0.4936	0.4695
3	0.9068	0.8913	0.8747	0.8571	0.8386	0.8194	0.7993	0.7787	0.7576	0.7360	0.7141	0.6919
4	0.9704	0.9636	0.9559	0.9473	0.9379	0.9275	0.9162	0.9041	0.8912	0.8774	0.8629	0.8477
5	0.9920	0.9896	0.9868	0.9834	0.9796	0.9751	0.9700	0.9643	0.9580	0.9510	0.9433	0.9349
6	0.9981	0.9974	0.9966	0.9955	0.9941	0.9925	0.9906	0.9884	0.9858	0.9828	0.9794	0.9756
7	0.9996	0.9994	0.9992	0.9989	0.9985	0.9980	0.9974	0.9967	0.9958	0.9947	0.9934	0.9919
8	0.9999	0.9999	0.9998	0.9998	0.9997	0.9995	0.9994	0.9991	0.9989	0.9985	0.9981	0.9976
9	1.0000	1.0000	1.0000	1.0000	0.9999	0.9999	0.9999	0.9998	0.9997	0.9996	0.9995	0.9993
10	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.9999	0.9999	0.9999	0.9998
11	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
x	2.90	3.00	3.10	3.20	3.30	3.40	3.50	3.60	3.70	3.80	3.90	4.00
0	0.0550	0.0498	0.0450	0.0408	0.0369	0.0334	0.0302	0.0273	0.0247	0.0224	0.0202	0.0183
1	0.2146	0.1991	0.1847	0.1712	0.1586	0.1468	0.1359	0.1257	0.1162	0.1074	0.0992	0.0916
2	0.4460	0.4232	0.4012	0.3799	0.3594	0.3397	0.3208	0.3027	0.2854	0.2689	0.2531	0.2381
3	0.6696	0.6472	0.6248	0.6025	0.5803	0.5584	0.5366	0.5152	0.4942	0.4735	0.4532	0.4335
4	0.8318	0.8153	0.7982	0.7806	0.7626	0.7442	0.7254	0.7064	0.6872	0.6678	0.6484	0.6288
5	0.9258	0.9161	0.9057	0.8946	0.8829	0.8705	0.8576	0.8441	0.8301	0.8156	0.8006	0.7851
6	0.9713	0.9665	0.9612	0.9554	0.9490	0.9421	0.9347	0.9267	0.9182	0.9091	0.8995	0.8893
7	0.9901	0.9881	0.9858	0.9832	0.9802	0.9769	0.9733	0.9692	0.9648	0.9599	0.9546	0.9489
8	0.9969	0.9962	0.9953	0.9943	0.9931	0.9917	0.9901	0.9883	0.9863	0.9840	0.9815	0.9786
9	0.9991	0.9989	0.9986	0.9982	0.9978	0.9973	0.9967	0.9960	0.9952	0.9942	0.9931	0.9919
10	0.9998	0.9997	0.9996	0.9995	0.9994	0.9992	0.9990	0.9987	0.9984	0.9981	0.9977	0.9972
11	0.9999	0.9999	0.9999	0.9999	0.9998	0.9998	0.9997	0.9996	0.9995	0.9994	0.9993	0.9991

## F Cumulative Poisson Probabilities (cont.)

<i>x</i>	$\lambda$											
	2.90	3.00	3.10	3.20	3.30	3.40	3.50	3.60	3.70	3.80	3.90	4.00
12	1.0000	1.0000	1.0000	1.0000	1.0000	0.9999	0.9999	0.9999	0.9999	0.9998	0.9998	0.9997
13	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.9999	0.9999
14	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
<i>x</i>	4.10	4.20	4.30	4.40	4.50	4.60	4.70	4.80	4.90	5.00	5.10	5.20
0	0.0166	0.0150	0.0136	0.0123	0.0111	0.0101	0.0091	0.0082	0.0074	0.0067	0.0061	0.0055
1	0.0845	0.0780	0.0719	0.0663	0.0611	0.0563	0.0518	0.0477	0.0439	0.0404	0.0372	0.0342
2	0.2238	0.2102	0.1974	0.1851	0.1736	0.1626	0.1523	0.1425	0.1333	0.1247	0.1165	0.1088
3	0.4142	0.3954	0.3772	0.3594	0.3423	0.3257	0.3097	0.2942	0.2793	0.2650	0.2513	0.2381
4	0.6093	0.5898	0.5704	0.5512	0.5321	0.5132	0.4946	0.4763	0.4582	0.4405	0.4231	0.4061
5	0.7693	0.7531	0.7367	0.7199	0.7029	0.6858	0.6684	0.6510	0.6335	0.6160	0.5984	0.5809
6	0.8786	0.8675	0.8558	0.8436	0.8311	0.8180	0.8046	0.7908	0.7767	0.7622	0.7474	0.7324
7	0.9427	0.9361	0.9290	0.9214	0.9134	0.9049	0.8960	0.8867	0.8769	0.8666	0.8560	0.8449
8	0.9755	0.9721	0.9683	0.9642	0.9597	0.9549	0.9497	0.9442	0.9382	0.9319	0.9252	0.9181
9	0.9905	0.9889	0.9871	0.9851	0.9829	0.9805	0.9778	0.9749	0.9717	0.9682	0.9644	0.9603
10	0.9966	0.9959	0.9952	0.9943	0.9933	0.9922	0.9910	0.9896	0.9880	0.9863	0.9844	0.9823
11	0.9989	0.9986	0.9983	0.9980	0.9976	0.9971	0.9966	0.9960	0.9953	0.9945	0.9937	0.9927
12	0.9997	0.9996	0.9995	0.9993	0.9992	0.9990	0.9988	0.9986	0.9983	0.9980	0.9976	0.9972
13	0.9999	0.9999	0.9998	0.9998	0.9997	0.9997	0.9996	0.9995	0.9994	0.9993	0.9992	0.9990
14	1.0000	1.0000	1.0000	0.9999	0.9999	0.9999	0.9999	0.9999	0.9998	0.9998	0.9997	0.9997
15	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.9999	0.9999	0.9999	0.9999
16	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
<i>x</i>	5.30	5.40	5.50	5.60	5.70	5.80	5.90	6.00	6.10	6.20	6.30	6.40
0	0.0050	0.0045	0.0041	0.0037	0.0033	0.0030	0.0027	0.0025	0.0022	0.0020	0.0018	0.0017
1	0.0314	0.0289	0.0266	0.0244	0.0224	0.0206	0.0189	0.0174	0.0159	0.0146	0.0134	0.0123
2	0.1016	0.0948	0.0884	0.0824	0.0768	0.0715	0.0666	0.0620	0.0577	0.0536	0.0498	0.0463
3	0.2254	0.2133	0.2017	0.1906	0.1800	0.1700	0.1604	0.1512	0.1425	0.1342	0.1264	0.1189
4	0.3895	0.3733	0.3575	0.3422	0.3272	0.3127	0.2987	0.2851	0.2719	0.2592	0.2469	0.2351
5	0.5635	0.5461	0.5289	0.5119	0.4950	0.4783	0.4619	0.4457	0.4298	0.4141	0.3988	0.3837
6	0.7171	0.7017	0.6860	0.6703	0.6544	0.6384	0.6224	0.6063	0.5902	0.5742	0.5582	0.5423
7	0.8335	0.8217	0.8095	0.7970	0.7841	0.7710	0.7576	0.7440	0.7301	0.7160	0.7017	0.6873
8	0.9106	0.9027	0.8944	0.8857	0.8766	0.8672	0.8574	0.8472	0.8367	0.8259	0.8148	0.8033
9	0.9559	0.9512	0.9462	0.9409	0.9352	0.9292	0.9228	0.9161	0.9090	0.9016	0.8939	0.8858
10	0.9800	0.9775	0.9747	0.9718	0.9686	0.9651	0.9614	0.9574	0.9531	0.9486	0.9437	0.9386
11	0.9916	0.9904	0.9890	0.9875	0.9859	0.9841	0.9821	0.9799	0.9776	0.9750	0.9723	0.9693
12	0.9967	0.9962	0.9955	0.9949	0.9941	0.9932	0.9922	0.9912	0.9900	0.9887	0.9873	0.9857
13	0.9988	0.9986	0.9983	0.9980	0.9977	0.9973	0.9969	0.9964	0.9958	0.9952	0.9945	0.9937
14	0.9996	0.9995	0.9994	0.9993	0.9991	0.9990	0.9988	0.9986	0.9984	0.9981	0.9978	0.9974
15	0.9999	0.9998	0.9998	0.9998	0.9997	0.9996	0.9996	0.9995	0.9994	0.9993	0.9992	0.9990
16	1.0000	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9998	0.9998	0.9997	0.9997	0.9996
17	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.9999	0.9999	0.9999	0.9999	0.9999
18	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
<i>x</i>	6.50	6.60	6.70	6.80	6.90	7.00	7.10	7.20	7.30	7.40	7.50	7.60
0	0.0015	0.0014	0.0012	0.0011	0.0010	0.0009	0.0008	0.0007	0.0007	0.0006	0.0006	0.0005
1	0.0113	0.0103	0.0095	0.0087	0.0080	0.0073	0.0067	0.0061	0.0056	0.0051	0.0047	0.0043
2	0.0430	0.0400	0.0371	0.0344	0.0320	0.0296	0.0275	0.0255	0.0236	0.0219	0.0203	0.0188
3	0.1118	0.1052	0.0988	0.0928	0.0871	0.0818	0.0767	0.0719	0.0674	0.0632	0.0591	0.0554

## F Cumulative Poisson Probabilities (cont.)

x	$\lambda$											
	6.50	6.60	6.70	6.80	6.90	7.00	7.10	7.20	7.30	7.40	7.50	7.60
4	0.2237	0.2127	0.2022	0.1920	0.1823	0.1730	0.1641	0.1555	0.1473	0.1395	0.1321	0.1249
5	0.3690	0.3547	0.3406	0.3270	0.3137	0.3007	0.2881	0.2759	0.2640	0.2526	0.2414	0.2307
6	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
7	0.6728	0.6581	0.6433	0.6285	0.6136	0.5987	0.5838	0.5689	0.5541	0.5393	0.5246	0.5100
8	0.7916	0.7796	0.7673	0.7548	0.7420	0.7291	0.7160	0.7027	0.6892	0.6757	0.6620	0.6482
9	0.8774	0.8686	0.8596	0.8502	0.8405	0.8305	0.8202	0.8096	0.7988	0.7877	0.7764	0.7649
10	0.9332	0.9274	0.9214	0.9151	0.9084	0.9015	0.8942	0.8867	0.8788	0.8707	0.8622	0.8535
11	0.9661	0.9627	0.9591	0.9552	0.9510	0.9467	0.9420	0.9371	0.9319	0.9265	0.9208	0.9148
12	0.9840	0.9821	0.9801	0.9779	0.9755	0.9730	0.9703	0.9673	0.9642	0.9609	0.9573	0.9536
13	0.9929	0.9920	0.9909	0.9898	0.9885	0.9872	0.9857	0.9841	0.9824	0.9805	0.9784	0.9762
14	0.9970	0.9966	0.9961	0.9956	0.9950	0.9943	0.9935	0.9927	0.9918	0.9908	0.9897	0.9886
15	0.9988	0.9986	0.9984	0.9982	0.9979	0.9976	0.9972	0.9969	0.9964	0.9959	0.9954	0.9948
16	0.9996	0.9995	0.9994	0.9993	0.9992	0.9990	0.9989	0.9987	0.9985	0.9983	0.9980	0.9978
17	0.9998	0.9998	0.9998	0.9997	0.9997	0.9996	0.9996	0.9995	0.9994	0.9993	0.9992	0.9991
18	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9998	0.9998	0.9998	0.9997	0.9997	0.9996
19	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999
20	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
x	7.70	7.80	7.90	8.00	8.10	8.20	8.30	8.40	8.50	8.60	8.70	8.80
0	0.0005	0.0004	0.0004	0.0003	0.0003	0.0003	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
1	0.0039	0.0036	0.0033	0.0030	0.0028	0.0025	0.0023	0.0021	0.0019	0.0018	0.0016	0.0015
2	0.0174	0.0161	0.0149	0.0138	0.0127	0.0118	0.0109	0.0100	0.0093	0.0086	0.0079	0.0073
3	0.0518	0.0485	0.0453	0.0424	0.0396	0.0370	0.0346	0.0323	0.0301	0.0281	0.0262	0.0244
4	0.1181	0.1117	0.1055	0.0996	0.0940	0.0887	0.0837	0.0789	0.0744	0.0701	0.0660	0.0621
5	0.2203	0.2103	0.2006	0.1912	0.1822	0.1736	0.1653	0.1573	0.1496	0.1422	0.1352	0.1284
6	0.3514	0.3384	0.3257	0.3134	0.3013	0.2896	0.2781	0.2670	0.2562	0.2457	0.2355	0.2256
7	0.4956	0.4812	0.4670	0.4530	0.4391	0.4254	0.4119	0.3987	0.3856	0.3728	0.3602	0.3478
8	0.6343	0.6204	0.6065	0.5925	0.5786	0.5647	0.5507	0.5369	0.5231	0.5094	0.4958	0.4823
9	0.7531	0.7411	0.7290	0.7166	0.7041	0.6915	0.6788	0.6659	0.6530	0.6400	0.6269	0.6137
10	0.8445	0.8352	0.8257	0.8159	0.8058	0.7955	0.7850	0.7743	0.7634	0.7522	0.7409	0.7294
11	0.9085	0.9020	0.8952	0.8881	0.8807	0.8731	0.8652	0.8571	0.8487	0.8400	0.8311	0.8220
12	0.9496	0.9454	0.9409	0.9362	0.9313	0.9261	0.9207	0.9150	0.9091	0.9029	0.8965	0.8898
13	0.9739	0.9714	0.9687	0.9658	0.9628	0.9595	0.9561	0.9524	0.9486	0.9445	0.9403	0.9358
14	0.9873	0.9859	0.9844	0.9827	0.9810	0.9791	0.9771	0.9749	0.9726	0.9701	0.9675	0.9647
15	0.9941	0.9934	0.9926	0.9918	0.9908	0.9898	0.9887	0.9875	0.9862	0.9848	0.9832	0.9816
16	0.9974	0.9971	0.9967	0.9963	0.9958	0.9953	0.9947	0.9941	0.9934	0.9926	0.9918	0.9909
17	0.9989	0.9988	0.9986	0.9984	0.9982	0.9979	0.9977	0.9973	0.9970	0.9966	0.9962	0.9957
18	0.9996	0.9995	0.9994	0.9993	0.9992	0.9991	0.9990	0.9989	0.9987	0.9985	0.9983	0.9981
19	0.9998	0.9998	0.9998	0.9997	0.9997	0.9997	0.9996	0.9995	0.9995	0.9994	0.9993	0.9992
20	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9998	0.9998	0.9998	0.9998	0.9997	0.9997
21	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999
22	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
x	8.90	9.00	9.10	9.20	9.30	9.40	9.50	9.60	9.70	9.80	9.90	10.00
0	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0000
1	0.0014	0.0012	0.0011	0.0010	0.0009	0.0009	0.0008	0.0007	0.0007	0.0006	0.0005	0.0005
2	0.0068	0.0062	0.0058	0.0053	0.0049	0.0045	0.0042	0.0038	0.0035	0.0033	0.0030	0.0028
3	0.0228	0.0212	0.0198	0.0184	0.0172	0.0160	0.0149	0.0138	0.0129	0.0120	0.0111	0.0103

## F

 Cumulative Poisson Probabilities (cont.)

$x$	$\lambda$											
	8.90	9.00	9.10	9.20	9.30	9.40	9.50	9.60	9.70	9.80	9.90	10.00
4	0.0584	0.0550	0.0517	0.0486	0.0456	0.0429	0.0403	0.0378	0.0355	0.0333	0.0312	0.0293
5	0.1219	0.1157	0.1098	0.1041	0.0986	0.0935	0.0885	0.0838	0.0793	0.0750	0.0710	0.0671
6	0.2160	0.2068	0.1978	0.1892	0.1808	0.1727	0.1649	0.1574	0.1502	0.1433	0.1366	0.1301
7	0.3357	0.3239	0.3123	0.3010	0.2900	0.2792	0.2687	0.2584	0.2485	0.2388	0.2294	0.2202
8	0.4689	0.4557	0.4426	0.4296	0.4168	0.4042	0.3918	0.3796	0.3676	0.3558	0.3442	0.3328
9	0.6006	0.5874	0.5742	0.5611	0.5479	0.5349	0.5218	0.5089	0.4960	0.4832	0.4705	0.4579
10	0.7178	0.7060	0.6941	0.6820	0.6699	0.6576	0.6453	0.6329	0.6205	0.6080	0.5955	0.5830
11	0.8126	0.8030	0.7932	0.7832	0.7730	0.7626	0.7520	0.7412	0.7303	0.7193	0.7081	0.6968
12	0.8829	0.8758	0.8684	0.8607	0.8529	0.8448	0.8364	0.8279	0.8191	0.8101	0.8009	0.7916
13	0.9311	0.9261	0.9210	0.9156	0.9100	0.9042	0.8981	0.8919	0.8853	0.8786	0.8716	0.8645
14	0.9617	0.9585	0.9552	0.9517	0.9480	0.9441	0.9400	0.9357	0.9312	0.9265	0.9216	0.9165
15	0.9798	0.9780	0.9760	0.9738	0.9715	0.9691	0.9665	0.9638	0.9609	0.9579	0.9546	0.9513
16	0.9899	0.9889	0.9878	0.9865	0.9852	0.9838	0.9823	0.9806	0.9789	0.9770	0.9751	0.9730
17	0.9952	0.9947	0.9941	0.9934	0.9927	0.9919	0.9911	0.9902	0.9892	0.9881	0.9870	0.9857
18	0.9978	0.9976	0.9973	0.9969	0.9966	0.9962	0.9957	0.9952	0.9947	0.9941	0.9935	0.9928
19	0.9991	0.9989	0.9988	0.9986	0.9985	0.9983	0.9980	0.9978	0.9975	0.9972	0.9969	0.9965
20	0.9996	0.9996	0.9995	0.9994	0.9993	0.9992	0.9991	0.9990	0.9989	0.9987	0.9986	0.9984
21	0.9998	0.9998	0.9998	0.9998	0.9997	0.9997	0.9996	0.9996	0.9995	0.9995	0.9994	0.9993
22	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9998	0.9998	0.9998	0.9997	0.9997
23	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999
24	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
$x$	10.10	10.20	10.30	10.40	10.50	10.60	10.70	10.80	10.90	11.00	11.10	11.20
0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1	0.0005	0.0004	0.0004	0.0003	0.0003	0.0003	0.0003	0.0002	0.0002	0.0002	0.0002	0.0002
2	0.0026	0.0023	0.0022	0.0020	0.0018	0.0017	0.0016	0.0014	0.0013	0.0012	0.0011	0.0010
3	0.0096	0.0089	0.0083	0.0077	0.0071	0.0066	0.0062	0.0057	0.0053	0.0049	0.0046	0.0042
4	0.0274	0.0257	0.0241	0.0225	0.0211	0.0197	0.0185	0.0173	0.0162	0.0151	0.0141	0.0132
5	0.0634	0.0599	0.0566	0.0534	0.0504	0.0475	0.0448	0.0423	0.0398	0.0375	0.0353	0.0333
6	0.1240	0.1180	0.1123	0.1069	0.1016	0.0966	0.0918	0.0872	0.0828	0.0786	0.0746	0.0708
7	0.2113	0.2027	0.1944	0.1863	0.1785	0.1710	0.1636	0.1566	0.1498	0.1432	0.1369	0.1307
8	0.3217	0.3108	0.3001	0.2896	0.2794	0.2694	0.2597	0.2502	0.2410	0.2320	0.2232	0.2147
9	0.4455	0.4332	0.4210	0.4090	0.3971	0.3854	0.3739	0.3626	0.3515	0.3405	0.3298	0.3192
10	0.5705	0.5580	0.5456	0.5331	0.5207	0.5084	0.4961	0.4840	0.4719	0.4599	0.4480	0.4362
11	0.6853	0.6738	0.6622	0.6505	0.6387	0.6269	0.6150	0.6031	0.5912	0.5793	0.5673	0.5554
12	0.7820	0.7722	0.7623	0.7522	0.7420	0.7316	0.7210	0.7104	0.6996	0.6887	0.6777	0.6666
13	0.8571	0.8494	0.8416	0.8336	0.8253	0.8169	0.8083	0.7995	0.7905	0.7813	0.7719	0.7624
14	0.9112	0.9057	0.9000	0.8940	0.8879	0.8815	0.8750	0.8682	0.8612	0.8540	0.8467	0.8391
15	0.9477	0.9440	0.9400	0.9359	0.9317	0.9272	0.9225	0.9177	0.9126	0.9074	0.9020	0.8963
16	0.9707	0.9684	0.9658	0.9632	0.9604	0.9574	0.9543	0.9511	0.9477	0.9441	0.9403	0.9364
17	0.9844	0.9830	0.9815	0.9799	0.9781	0.9763	0.9744	0.9723	0.9701	0.9678	0.9654	0.9628
18	0.9921	0.9913	0.9904	0.9895	0.9885	0.9874	0.9863	0.9850	0.9837	0.9823	0.9808	0.9792
19	0.9962	0.9957	0.9953	0.9948	0.9942	0.9936	0.9930	0.9923	0.9915	0.9907	0.9898	0.9889
20	0.9982	0.9980	0.9978	0.9975	0.9972	0.9969	0.9966	0.9962	0.9958	0.9953	0.9948	0.9943
21	0.9992	0.9991	0.9990	0.9989	0.9987	0.9986	0.9984	0.9982	0.9980	0.9977	0.9975	0.9972
22	0.9997	0.9996	0.9996	0.9995	0.9994	0.9994	0.9993	0.9992	0.9991	0.9990	0.9988	0.9987
23	0.9999	0.9998	0.9998	0.9998	0.9998	0.9997	0.9997	0.9996	0.9996	0.9995	0.9995	0.9994

## F Cumulative Poisson Probabilities (cont.)

x	$\lambda$											
	10.10	10.20	10.30	10.40	10.50	10.60	10.70	10.80	10.90	11.00	11.10	11.20
24	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9998	0.9998	0.9998	0.9998	0.9997
25	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999
26	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
x	11.30	11.40	11.50	11.60	11.70	11.80	11.90	12.00	12.10	12.20	12.30	12.40
0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
2	0.0009	0.0009	0.0008	0.0007	0.0007	0.0006	0.0006	0.0005	0.0005	0.0004	0.0004	0.0004
3	0.0039	0.0036	0.0034	0.0031	0.0029	0.0027	0.0025	0.0023	0.0021	0.0020	0.0018	0.0017
4	0.0123	0.0115	0.0107	0.0100	0.0094	0.0087	0.0081	0.0076	0.0071	0.0066	0.0062	0.0057
5	0.0313	0.0295	0.0277	0.0261	0.0245	0.0230	0.0217	0.0203	0.0191	0.0179	0.0168	0.0158
6	0.0671	0.0636	0.0603	0.0571	0.0541	0.0512	0.0484	0.0458	0.0433	0.0410	0.0387	0.0366
7	0.1249	0.1192	0.1137	0.1085	0.1035	0.0986	0.0940	0.0895	0.0852	0.0811	0.0772	0.0734
8	0.2064	0.1984	0.1906	0.1830	0.1757	0.1686	0.1617	0.1550	0.1486	0.1424	0.1363	0.1305
9	0.3089	0.2987	0.2888	0.2791	0.2696	0.2603	0.2512	0.2424	0.2338	0.2254	0.2172	0.2092
10	0.4246	0.4131	0.4017	0.3905	0.3794	0.3685	0.3578	0.3472	0.3368	0.3266	0.3166	0.3067
11	0.5435	0.5316	0.5198	0.5080	0.4963	0.4847	0.4731	0.4616	0.4502	0.4389	0.4278	0.4167
12	0.6555	0.6442	0.6329	0.6216	0.6102	0.5988	0.5874	0.5760	0.5645	0.5531	0.5417	0.5303
13	0.7528	0.7430	0.7330	0.7230	0.7128	0.7025	0.6920	0.6815	0.6709	0.6603	0.6495	0.6387
14	0.8313	0.8234	0.8153	0.8069	0.7985	0.7898	0.7810	0.7720	0.7629	0.7536	0.7442	0.7347
15	0.8905	0.8845	0.8783	0.8719	0.8653	0.8585	0.8516	0.8444	0.8371	0.8296	0.8219	0.8140
16	0.9323	0.9280	0.9236	0.9190	0.9142	0.9092	0.9040	0.8987	0.8932	0.8875	0.8816	0.8755
17	0.9601	0.9572	0.9542	0.9511	0.9478	0.9444	0.9408	0.9370	0.9331	0.9290	0.9248	0.9204
18	0.9775	0.9757	0.9738	0.9718	0.9697	0.9674	0.9651	0.9626	0.9600	0.9572	0.9543	0.9513
19	0.9879	0.9868	0.9857	0.9845	0.9832	0.9818	0.9803	0.9787	0.9771	0.9753	0.9734	0.9715
20	0.9938	0.9932	0.9925	0.9918	0.9910	0.9902	0.9893	0.9884	0.9874	0.9863	0.9852	0.9840
21	0.9969	0.9966	0.9962	0.9958	0.9954	0.9950	0.9945	0.9939	0.9934	0.9927	0.9921	0.9914
22	0.9985	0.9984	0.9982	0.9980	0.9978	0.9975	0.9972	0.9970	0.9966	0.9963	0.9959	0.9955
23	0.9993	0.9992	0.9992	0.9991	0.9989	0.9988	0.9987	0.9985	0.9984	0.9982	0.9980	0.9978
24	0.9997	0.9997	0.9996	0.9996	0.9995	0.9995	0.9994	0.9993	0.9992	0.9991	0.9990	0.9989
25	0.9999	0.9999	0.9998	0.9998	0.9998	0.9998	0.9997	0.9997	0.9997	0.9996	0.9996	0.9995
26	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9998	0.9998	0.9998	0.9998
27	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.9999	0.9999	0.9999	0.9999	0.9999
28	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
x	12.50	12.60	12.70	12.80	12.90	13.00	14.00	15.00	16.00	17.00	18.00	19.00
0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2	0.0003	0.0003	0.0003	0.0003	0.0002	0.0002	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
3	0.0016	0.0014	0.0013	0.0012	0.0011	0.0011	0.0005	0.0002	0.0001	0.0000	0.0000	0.0000
4	0.0053	0.0050	0.0046	0.0043	0.0040	0.0037	0.0018	0.0009	0.0004	0.0002	0.0001	0.0000
5	0.0148	0.0139	0.0130	0.0122	0.0115	0.0107	0.0055	0.0028	0.0014	0.0007	0.0003	0.0002
6	0.0346	0.0326	0.0308	0.0291	0.0274	0.0259	0.0142	0.0076	0.0040	0.0021	0.0010	0.0005
7	0.0698	0.0664	0.0631	0.0599	0.0569	0.0540	0.0316	0.0180	0.0100	0.0054	0.0029	0.0015
8	0.1249	0.1195	0.1143	0.1093	0.1044	0.0998	0.0621	0.0374	0.0220	0.0126	0.0071	0.0039
9	0.2014	0.1939	0.1866	0.1794	0.1725	0.1658	0.1094	0.0699	0.0433	0.0261	0.0154	0.0089
10	0.2971	0.2876	0.2783	0.2693	0.2604	0.2517	0.1757	0.1185	0.0774	0.0491	0.0304	0.0183
11	0.4058	0.3950	0.3843	0.3738	0.3634	0.3532	0.2600	0.1848	0.1270	0.0847	0.0549	0.0347

## F

 Cumulative Poisson Probabilities (cont.)

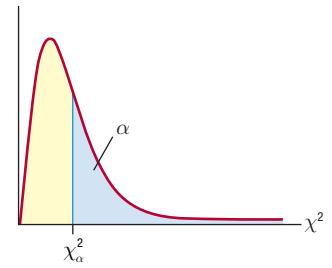
<i>x</i>	$\lambda$											
	12.50	12.60	12.70	12.80	12.90	13.00	14.00	15.00	16.00	17.00	18.00	19.00
12	0.5190	0.5077	0.4964	0.4853	0.4741	0.4631	0.3585	0.2676	0.1931	0.1350	0.0917	0.0606
13	0.6278	0.6169	0.6060	0.5950	0.5840	0.5730	0.4644	0.3632	0.2745	0.2009	0.1426	0.0984
14	0.7250	0.7153	0.7054	0.6954	0.6853	0.6751	0.5704	0.4657	0.3675	0.2808	0.2081	0.1497
15	0.8060	0.7978	0.7895	0.7810	0.7724	0.7636	0.6694	0.5681	0.4667	0.3715	0.2867	0.2148
16	0.8693	0.8629	0.8563	0.8495	0.8426	0.8355	0.7559	0.6641	0.5660	0.4677	0.3751	0.2920
17	0.9158	0.9111	0.9062	0.9011	0.8959	0.8905	0.8272	0.7489	0.6593	0.5640	0.4686	0.3784
18	0.9481	0.9448	0.9414	0.9378	0.9341	0.9302	0.8826	0.8195	0.7423	0.6550	0.5622	0.4695
19	0.9694	0.9672	0.9649	0.9625	0.9600	0.9573	0.9235	0.8752	0.8122	0.7363	0.6509	0.5606
20	0.9827	0.9813	0.9799	0.9783	0.9767	0.9750	0.9521	0.9170	0.8682	0.8055	0.7307	0.6472
21	0.9906	0.9898	0.9889	0.9880	0.9870	0.9859	0.9712	0.9469	0.9108	0.8615	0.7991	0.7255
22	0.9951	0.9946	0.9941	0.9936	0.9930	0.9924	0.9833	0.9673	0.9418	0.9047	0.8551	0.7931
23	0.9975	0.9973	0.9970	0.9967	0.9964	0.9960	0.9907	0.9805	0.9633	0.9367	0.8989	0.8490
24	0.9988	0.9987	0.9985	0.9984	0.9982	0.9980	0.9950	0.9888	0.9777	0.9594	0.9317	0.8933
25	0.9994	0.9994	0.9993	0.9992	0.9991	0.9990	0.9974	0.9938	0.9869	0.9748	0.9554	0.9269
26	0.9997	0.9997	0.9997	0.9996	0.9996	0.9995	0.9987	0.9967	0.9925	0.9848	0.9718	0.9514
27	0.9999	0.9999	0.9999	0.9998	0.9998	0.9998	0.9994	0.9983	0.9959	0.9912	0.9827	0.9687
28	1.0000	0.9999	0.9999	0.9999	0.9999	0.9999	0.9997	0.9991	0.9978	0.9950	0.9897	0.9805
29	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.9999	0.9996	0.9989	0.9973	0.9941	0.9882
30	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.9999	0.9998	0.9994	0.9986	0.9967	0.9930
31	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.9999	0.9997	0.9993	0.9982	0.9960
32	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.9999	0.9996	0.9990	0.9978
33	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.9999	0.9998	0.9995	0.9988
34	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.9999	0.9998	0.9994
35	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.9999	0.9997
36	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.9999	0.9998
37	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.9999
38	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
<i>x</i>	20.00	21.00	22.00	23.00	24.00	25.00	26.00	27.00	28.00	29.00	30.00	31.00
0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
5	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
6	0.0003	0.0001	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
7	0.0008	0.0004	0.0002	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
8	0.0021	0.0011	0.0006	0.0003	0.0002	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
9	0.0050	0.0028	0.0015	0.0008	0.0004	0.0002	0.0001	0.0001	0.0000	0.0000	0.0000	0.0000
10	0.0108	0.0063	0.0035	0.0020	0.0011	0.0006	0.0003	0.0002	0.0001	0.0000	0.0000	0.0000
11	0.0214	0.0129	0.0076	0.0044	0.0025	0.0014	0.0008	0.0004	0.0002	0.0001	0.0001	0.0000
12	0.0390	0.0245	0.0151	0.0091	0.0054	0.0031	0.0018	0.0010	0.0006	0.0003	0.0002	0.0001
13	0.0661	0.0434	0.0278	0.0174	0.0107	0.0065	0.0038	0.0022	0.0013	0.0007	0.0004	0.0002
14	0.1049	0.0716	0.0477	0.0311	0.0198	0.0124	0.0076	0.0046	0.0027	0.0016	0.0009	0.0005
15	0.1565	0.1111	0.0769	0.0520	0.0344	0.0223	0.0142	0.0088	0.0054	0.0033	0.0019	0.0011
16	0.2211	0.1629	0.1170	0.0821	0.0563	0.0377	0.0248	0.0160	0.0101	0.0063	0.0039	0.0023
17	0.2970	0.2270	0.1690	0.1228	0.0871	0.0605	0.0411	0.0274	0.0179	0.0115	0.0073	0.0045





# G Critical Values of $\chi^2$

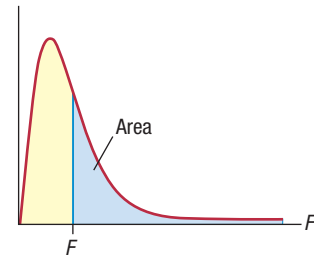
Numerical entries represent the value of  $\chi^2_{\alpha}$ .



Area to the Right of the Critical Value

<i>df</i>	$\chi^2_{0.995}$	$\chi^2_{0.990}$	$\chi^2_{0.975}$	$\chi^2_{0.950}$	$\chi^2_{0.900}$	$\chi^2_{0.100}$	$\chi^2_{0.050}$	$\chi^2_{0.025}$	$\chi^2_{0.010}$	$\chi^2_{0.005}$
1	0.000	0.000	0.001	0.004	0.016	2.706	3.841	5.024	6.635	7.879
2	0.010	0.020	0.051	0.103	0.211	4.605	5.991	7.378	9.210	10.597
3	0.072	0.115	0.216	0.352	0.584	6.251	7.815	9.348	11.345	12.838
4	0.207	0.297	0.484	0.711	1.064	7.779	9.488	11.143	13.277	14.860
5	0.412	0.554	0.831	1.145	1.610	9.236	11.070	12.833	15.086	16.750
6	0.676	0.872	1.237	1.635	2.204	10.645	12.592	14.449	16.812	18.548
7	0.989	1.239	1.690	2.167	2.833	12.017	14.067	16.013	18.475	20.278
8	1.344	1.646	2.180	2.733	3.490	13.362	15.507	17.535	20.090	21.955
9	1.735	2.088	2.700	3.325	4.168	14.684	16.919	19.023	21.666	23.589
10	2.156	2.558	3.247	3.940	4.865	15.987	18.307	20.483	23.209	25.188
11	2.603	3.053	3.816	4.575	5.578	17.275	19.675	21.920	24.725	26.757
12	3.074	3.571	4.404	5.226	6.304	18.549	21.026	23.337	26.217	28.300
13	3.565	4.107	5.009	5.892	7.042	19.812	22.362	24.736	27.688	29.819
14	4.075	4.660	5.629	6.571	7.790	21.064	23.685	26.119	29.141	31.319
15	4.601	5.229	6.262	7.261	8.547	22.307	24.996	27.488	30.578	32.801
16	5.142	5.812	6.908	7.962	9.312	23.542	26.296	28.845	32.000	34.267
17	5.697	6.408	7.564	8.672	10.085	24.769	27.587	30.191	33.409	35.718
18	6.265	7.015	8.231	9.390	10.865	25.989	28.869	31.526	34.805	37.156
19	6.844	7.633	8.907	10.117	11.651	27.204	30.144	32.852	36.191	38.582
20	7.434	8.260	9.591	10.851	12.443	28.412	31.410	34.170	37.566	39.997
21	8.034	8.897	10.283	11.591	13.240	29.615	32.671	35.479	38.932	41.401
22	8.643	9.542	10.982	12.338	14.041	30.813	33.924	36.781	40.289	42.796
23	9.260	10.196	11.689	13.091	14.848	32.007	35.172	38.076	41.638	44.181
24	9.886	10.856	12.401	13.848	15.659	33.196	36.415	39.364	42.980	45.559
25	10.520	11.524	13.120	14.611	16.473	34.382	37.652	40.646	44.314	46.928
26	11.160	12.198	13.844	15.379	17.292	35.563	38.885	41.923	45.642	48.290
27	11.808	12.879	14.573	16.151	18.114	36.741	40.113	43.195	46.963	49.645
28	12.461	13.565	15.308	16.928	18.939	37.916	41.337	44.461	48.278	50.993
29	13.121	14.256	16.047	17.708	19.768	39.087	42.557	45.722	49.588	52.336
30	13.787	14.953	16.791	18.493	20.599	40.256	43.773	46.979	50.892	53.672
40	20.707	22.164	24.433	26.509	29.051	51.805	55.758	59.342	63.691	66.766
50	27.991	29.707	32.357	34.764	37.689	63.167	67.505	71.420	76.154	79.490
60	35.534	37.485	40.482	43.188	46.459	74.397	79.082	83.298	88.379	91.952
70	43.275	45.442	48.758	51.739	55.329	85.527	90.531	95.023	100.425	104.215
80	51.172	53.540	57.153	60.391	64.278	96.578	101.879	106.629	112.329	116.321
90	59.196	61.754	65.647	69.126	73.291	107.565	113.145	118.136	124.116	128.299
100	67.328	70.065	74.222	77.929	82.358	118.498	124.342	129.561	135.807	140.169

# H Critical Values of the *F*-Distribution ( $\alpha = 0.995$ )



		Numerator Degrees of Freedom								
		1	2	3	4	5	6	7	8	9
Denominator Degrees of Freedom	1	0.0001	0.0050	0.0180	0.0319	0.0439	0.0537	0.0616	0.0681	0.0735
	2	0.0001	0.0050	0.0201	0.0380	0.0546	0.0688	0.0806	0.0906	0.0989
	3	0.0000	0.0050	0.0211	0.0412	0.0605	0.0774	0.0919	0.1042	0.1147
	4	0.0000	0.0050	0.0216	0.0432	0.0643	0.0831	0.0995	0.1136	0.1257
	5	0.0000	0.0050	0.0220	0.0445	0.0669	0.0872	0.1050	0.1205	0.1338
	6	0.0000	0.0050	0.0223	0.0455	0.0689	0.0903	0.1092	0.1258	0.1402
	7	0.0000	0.0050	0.0225	0.0462	0.0704	0.0927	0.1125	0.1300	0.1452
	8	0.0000	0.0050	0.0227	0.0468	0.0716	0.0946	0.1152	0.1334	0.1494
	9	0.0000	0.0050	0.0228	0.0473	0.0726	0.0962	0.1175	0.1363	0.1529
	10	0.0000	0.0050	0.0229	0.0477	0.0734	0.0976	0.1193	0.1387	0.1558
	11	0.0000	0.0050	0.0230	0.0480	0.0741	0.0987	0.1209	0.1408	0.1584
	12	0.0000	0.0050	0.0230	0.0483	0.0747	0.0997	0.1223	0.1426	0.1606
	13	0.0000	0.0050	0.0231	0.0485	0.0752	0.1005	0.1235	0.1441	0.1625
	14	0.0000	0.0050	0.0232	0.0487	0.0757	0.1012	0.1246	0.1455	0.1642
	15	0.0000	0.0050	0.0232	0.0489	0.0761	0.1019	0.1255	0.1468	0.1658
	16	0.0000	0.0050	0.0233	0.0491	0.0764	0.1025	0.1263	0.1479	0.1671
	17	0.0000	0.0050	0.0233	0.0492	0.0767	0.1030	0.1271	0.1489	0.1684
	18	0.0000	0.0050	0.0233	0.0494	0.0770	0.1035	0.1278	0.1498	0.1695
	19	0.0000	0.0050	0.0234	0.0495	0.0773	0.1039	0.1284	0.1506	0.1705
	20	0.0000	0.0050	0.0234	0.0496	0.0775	0.1043	0.1290	0.1513	0.1715
	21	0.0000	0.0050	0.0234	0.0497	0.0777	0.1046	0.1295	0.1520	0.1723
	22	0.0000	0.0050	0.0234	0.0498	0.0779	0.1050	0.1300	0.1526	0.1731
	23	0.0000	0.0050	0.0234	0.0499	0.0781	0.1053	0.1304	0.1532	0.1739
	24	0.0000	0.0050	0.0235	0.0499	0.0782	0.1055	0.1308	0.1538	0.1745
	25	0.0000	0.0050	0.0235	0.0500	0.0784	0.1058	0.1312	0.1543	0.1752
	26	0.0000	0.0050	0.0235	0.0501	0.0785	0.1060	0.1315	0.1547	0.1758
	27	0.0000	0.0050	0.0235	0.0501	0.0787	0.1063	0.1319	0.1552	0.1763
	28	0.0000	0.0050	0.0235	0.0502	0.0788	0.1065	0.1322	0.1556	0.1768
	29	0.0000	0.0050	0.0235	0.0502	0.0789	0.1067	0.1325	0.1560	0.1773
30	0.0000	0.0050	0.0235	0.0503	0.0790	0.1069	0.1327	0.1563	0.1778	
40	0.0000	0.0050	0.0236	0.0506	0.0798	0.1082	0.1347	0.1590	0.1812	
60	0.0000	0.0050	0.0237	0.0510	0.0806	0.1096	0.1368	0.1619	0.1848	
120	0.0000	0.0050	0.0238	0.0514	0.0815	0.1111	0.1390	0.1649	0.1887	
$\infty$	0.0000	0.0050	0.0239	0.0517	0.0823	0.1126	0.1413	0.1681	0.1928	

## H

**Critical Values of the  $F$ -Distribution ( $\alpha = 0.995$ ) (cont.)**

		Numerator Degrees of Freedom								
		10	11	12	13	14	15	16	17	18
Denominator Degrees of Freedom	1	0.0780	0.0818	0.0851	0.0879	0.0904	0.0926	0.0946	0.0963	0.0979
	2	0.1061	0.1122	0.1175	0.1222	0.1262	0.1299	0.1331	0.1360	0.1386
	3	0.1238	0.1316	0.1384	0.1444	0.1497	0.1544	0.1586	0.1625	0.1659
	4	0.1362	0.1453	0.1533	0.1604	0.1667	0.1723	0.1774	0.1819	0.1861
	5	0.1455	0.1557	0.1647	0.1727	0.1798	0.1861	0.1919	0.1971	0.2018
	6	0.1528	0.1639	0.1737	0.1824	0.1902	0.1972	0.2035	0.2093	0.2145
	7	0.1587	0.1705	0.1810	0.1904	0.1988	0.2063	0.2131	0.2193	0.2250
	8	0.1635	0.1760	0.1871	0.1970	0.2059	0.2139	0.2212	0.2278	0.2339
	9	0.1676	0.1806	0.1922	0.2026	0.2120	0.2204	0.2281	0.2351	0.2415
	10	0.1710	0.1846	0.1966	0.2075	0.2172	0.2261	0.2341	0.2414	0.2481
	11	0.1740	0.1880	0.2005	0.2117	0.2218	0.2310	0.2393	0.2469	0.2539
	12	0.1766	0.1910	0.2038	0.2154	0.2258	0.2353	0.2439	0.2518	0.2591
	13	0.1789	0.1936	0.2068	0.2187	0.2294	0.2392	0.2481	0.2562	0.2637
	14	0.1810	0.1960	0.2094	0.2216	0.2326	0.2426	0.2517	0.2601	0.2678
	15	0.1828	0.1981	0.2118	0.2242	0.2355	0.2457	0.2551	0.2636	0.2715
	16	0.1844	0.2000	0.2139	0.2266	0.2381	0.2485	0.2581	0.2669	0.2749
	17	0.1859	0.2017	0.2159	0.2287	0.2404	0.2511	0.2608	0.2698	0.2780
	18	0.1873	0.2032	0.2177	0.2307	0.2426	0.2534	0.2634	0.2725	0.2809
	19	0.1885	0.2047	0.2193	0.2325	0.2446	0.2556	0.2657	0.2749	0.2835
	20	0.1896	0.2060	0.2208	0.2342	0.2464	0.2576	0.2678	0.2772	0.2859
	21	0.1906	0.2072	0.2221	0.2357	0.2481	0.2594	0.2698	0.2793	0.2881
	22	0.1916	0.2083	0.2234	0.2371	0.2496	0.2611	0.2716	0.2813	0.2902
	23	0.1925	0.2093	0.2246	0.2384	0.2511	0.2627	0.2733	0.2831	0.2922
	24	0.1933	0.2103	0.2257	0.2397	0.2524	0.2641	0.2749	0.2848	0.2940
	25	0.1941	0.2112	0.2267	0.2408	0.2537	0.2655	0.2764	0.2864	0.2957
	26	0.1948	0.2120	0.2276	0.2419	0.2549	0.2668	0.2778	0.2879	0.2973
	27	0.1954	0.2128	0.2285	0.2429	0.2560	0.2680	0.2791	0.2893	0.2988
	28	0.1961	0.2135	0.2294	0.2438	0.2570	0.2692	0.2803	0.2906	0.3002
	29	0.1967	0.2142	0.2302	0.2447	0.2580	0.2702	0.2815	0.2919	0.3015
	30	0.1972	0.2149	0.2309	0.2455	0.2589	0.2712	0.2826	0.2930	0.3028
40	0.2014	0.2197	0.2365	0.2519	0.2660	0.2789	0.2909	0.3020	0.3124	
60	0.2058	0.2250	0.2425	0.2587	0.2736	0.2873	0.3001	0.3119	0.3230	
120	0.2105	0.2306	0.2491	0.2661	0.2819	0.2965	0.3102	0.3229	0.3348	
$\infty$	0.2156	0.2367	0.2562	0.2742	0.2910	0.3067	0.3214	0.3351	0.3480	

## H

**Critical Values of the  $F$ -Distribution ( $\alpha = 0.995$ ) (cont.)**

		Numerator Degrees of Freedom						
		19	20	24	30	40	60	120
Denominator Degrees of Freedom	<b>1</b>	0.0993	0.1006	0.1047	0.1089	0.1133	0.1177	0.1223
	<b>2</b>	0.1410	0.1431	0.1501	0.1574	0.1648	0.1726	0.1805
	<b>3</b>	0.1690	0.1719	0.1812	0.1909	0.2010	0.2115	0.2224
	<b>4</b>	0.1898	0.1933	0.2045	0.2163	0.2286	0.2416	0.2551
	<b>5</b>	0.2061	0.2100	0.2229	0.2365	0.2509	0.2660	0.2818
	<b>6</b>	0.2192	0.2236	0.2380	0.2532	0.2693	0.2864	0.3044
	<b>7</b>	0.2302	0.2349	0.2506	0.2673	0.2850	0.3038	0.3239
	<b>8</b>	0.2394	0.2445	0.2613	0.2793	0.2985	0.3190	0.3410
	<b>9</b>	0.2474	0.2528	0.2706	0.2898	0.3104	0.3324	0.3561
	<b>10</b>	0.2543	0.2599	0.2788	0.2990	0.3208	0.3443	0.3697
	<b>11</b>	0.2603	0.2663	0.2860	0.3072	0.3302	0.3550	0.3819
	<b>12</b>	0.2657	0.2719	0.2924	0.3146	0.3386	0.3647	0.3931
	<b>13</b>	0.2706	0.2769	0.2982	0.3212	0.3463	0.3735	0.4033
	<b>14</b>	0.2749	0.2815	0.3034	0.3272	0.3532	0.3816	0.4127
	<b>15</b>	0.2788	0.2856	0.3081	0.3327	0.3596	0.3890	0.4215
	<b>16</b>	0.2824	0.2893	0.3124	0.3377	0.3654	0.3959	0.4296
	<b>17</b>	0.2856	0.2927	0.3164	0.3423	0.3708	0.4023	0.4371
	<b>18</b>	0.2886	0.2958	0.3200	0.3466	0.3758	0.4082	0.4442
	<b>19</b>	0.2914	0.2987	0.3234	0.3506	0.3805	0.4137	0.4508
	<b>20</b>	0.2939	0.3014	0.3265	0.3542	0.3848	0.4189	0.4570
	<b>21</b>	0.2963	0.3039	0.3295	0.3577	0.3889	0.4238	0.4629
	<b>22</b>	0.2985	0.3062	0.3322	0.3609	0.3927	0.4283	0.4684
	<b>23</b>	0.3006	0.3083	0.3347	0.3639	0.3963	0.4326	0.4737
	<b>24</b>	0.3025	0.3104	0.3371	0.3667	0.3997	0.4367	0.4787
	<b>25</b>	0.3043	0.3123	0.3393	0.3693	0.4029	0.4406	0.4834
	<b>26</b>	0.3059	0.3140	0.3414	0.3718	0.4059	0.4442	0.4879
	<b>27</b>	0.3075	0.3157	0.3434	0.3742	0.4087	0.4477	0.4922
	<b>28</b>	0.3090	0.3173	0.3452	0.3764	0.4114	0.4510	0.4964
	<b>29</b>	0.3104	0.3188	0.3470	0.3785	0.4140	0.4542	0.5003
	<b>30</b>	0.3118	0.3202	0.3487	0.3805	0.4164	0.4572	0.5040
<b>40</b>	0.3220	0.3310	0.3616	0.3962	0.4356	0.4810	0.5345	
<b>60</b>	0.3333	0.3429	0.3762	0.4141	0.4579	0.5096	0.5725	
<b>120</b>	0.3459	0.3564	0.3927	0.4348	0.4846	0.5452	0.6229	
$\infty$	0.3602	0.3717	0.4119	0.4596	0.5177	0.5922	0.6988	

## H Critical Values of the $F$ -Distribution ( $\alpha = 0.990$ )

		Numerator Degrees of Freedom								
		1	2	3	4	5	6	7	8	9
Denominator Degrees of Freedom	1	0.0002	0.0102	0.0293	0.0472	0.0615	0.0728	0.0817	0.0888	0.0947
	2	0.0002	0.0101	0.0325	0.0556	0.0753	0.0915	0.1047	0.1156	0.1247
	3	0.0002	0.0101	0.0339	0.0599	0.0829	0.1023	0.1183	0.1317	0.1430
	4	0.0002	0.0101	0.0348	0.0626	0.0878	0.1093	0.1274	0.1427	0.1557
	5	0.0002	0.0101	0.0354	0.0644	0.0912	0.1143	0.1340	0.1508	0.1651
	6	0.0002	0.0101	0.0358	0.0658	0.0937	0.1181	0.1391	0.1570	0.1724
	7	0.0002	0.0101	0.0361	0.0668	0.0956	0.1211	0.1430	0.1619	0.1782
	8	0.0002	0.0101	0.0364	0.0676	0.0972	0.1234	0.1462	0.1659	0.1829
	9	0.0002	0.0101	0.0366	0.0682	0.0984	0.1254	0.1488	0.1692	0.1869
	10	0.0002	0.0101	0.0367	0.0687	0.0995	0.1270	0.1511	0.1720	0.1902
	11	0.0002	0.0101	0.0369	0.0692	0.1004	0.1284	0.1529	0.1744	0.1931
	12	0.0002	0.0101	0.0370	0.0696	0.1011	0.1296	0.1546	0.1765	0.1956
	13	0.0002	0.0101	0.0371	0.0699	0.1018	0.1306	0.1560	0.1783	0.1978
	14	0.0002	0.0101	0.0371	0.0702	0.1024	0.1315	0.1573	0.1799	0.1998
	15	0.0002	0.0101	0.0372	0.0704	0.1029	0.1323	0.1584	0.1813	0.2015
	16	0.0002	0.0101	0.0373	0.0707	0.1033	0.1330	0.1594	0.1826	0.2031
	17	0.0002	0.0101	0.0373	0.0708	0.1037	0.1336	0.1603	0.1837	0.2045
	18	0.0002	0.0101	0.0374	0.0710	0.1041	0.1342	0.1611	0.1848	0.2058
	19	0.0002	0.0101	0.0374	0.0712	0.1044	0.1347	0.1618	0.1857	0.2069
	20	0.0002	0.0101	0.0375	0.0713	0.1047	0.1352	0.1625	0.1866	0.2080
	21	0.0002	0.0101	0.0375	0.0715	0.1050	0.1356	0.1631	0.1874	0.2090
	22	0.0002	0.0101	0.0375	0.0716	0.1052	0.1360	0.1636	0.1881	0.2099
	23	0.0002	0.0101	0.0376	0.0717	0.1054	0.1364	0.1641	0.1888	0.2107
	24	0.0002	0.0101	0.0376	0.0718	0.1056	0.1367	0.1646	0.1894	0.2115
	25	0.0002	0.0101	0.0376	0.0719	0.1058	0.1371	0.1651	0.1900	0.2122
	26	0.0002	0.0101	0.0376	0.0720	0.1060	0.1374	0.1655	0.1905	0.2128
	27	0.0002	0.0101	0.0377	0.0721	0.1062	0.1376	0.1659	0.1910	0.2135
	28	0.0002	0.0101	0.0377	0.0721	0.1063	0.1379	0.1662	0.1915	0.2141
	29	0.0002	0.0101	0.0377	0.0722	0.1065	0.1381	0.1666	0.1920	0.2146
	30	0.0002	0.0101	0.0377	0.0723	0.1066	0.1383	0.1669	0.1924	0.2151
40	0.0002	0.0101	0.0379	0.0728	0.1076	0.1400	0.1692	0.1955	0.2190	
60	0.0002	0.0101	0.0380	0.0732	0.1087	0.1417	0.1717	0.1987	0.2231	
120	0.0002	0.0101	0.0381	0.0738	0.1097	0.1435	0.1743	0.2022	0.2274	
$\infty$	0.0002	0.0101	0.0383	0.0743	0.1109	0.1453	0.1770	0.2058	0.2320	

## H

**Critical Values of the  $F$ -Distribution ( $\alpha = 0.990$ ) (cont.)**

		Numerator Degrees of Freedom								
		10	11	12	13	14	15	16	17	18
Denominator Degrees of Freedom	1	0.0996	0.1037	0.1072	0.1102	0.1128	0.1152	0.1172	0.1191	0.1207
	2	0.1323	0.1388	0.1444	0.1492	0.1535	0.1573	0.1606	0.1636	0.1663
	3	0.1526	0.1609	0.1680	0.1742	0.1797	0.1846	0.1890	0.1929	0.1964
	4	0.1668	0.1764	0.1848	0.1921	0.1986	0.2044	0.2095	0.2142	0.2184
	5	0.1774	0.1881	0.1975	0.2057	0.2130	0.2195	0.2254	0.2306	0.2354
	6	0.1857	0.1973	0.2074	0.2164	0.2244	0.2316	0.2380	0.2438	0.2491
	7	0.1923	0.2047	0.2155	0.2252	0.2338	0.2415	0.2484	0.2547	0.2604
	8	0.1978	0.2108	0.2223	0.2324	0.2415	0.2497	0.2571	0.2638	0.2699
	9	0.2023	0.2159	0.2279	0.2386	0.2482	0.2568	0.2645	0.2716	0.2780
	10	0.2062	0.2203	0.2328	0.2439	0.2538	0.2628	0.2709	0.2783	0.2850
	11	0.2096	0.2241	0.2370	0.2485	0.2588	0.2681	0.2765	0.2842	0.2912
	12	0.2125	0.2274	0.2407	0.2525	0.2631	0.2728	0.2815	0.2894	0.2967
	13	0.2151	0.2303	0.2439	0.2561	0.2670	0.2769	0.2859	0.2941	0.3015
	14	0.2174	0.2329	0.2468	0.2592	0.2704	0.2806	0.2898	0.2982	0.3059
	15	0.2194	0.2352	0.2494	0.2621	0.2735	0.2839	0.2933	0.3020	0.3099
	16	0.2212	0.2373	0.2517	0.2647	0.2763	0.2869	0.2966	0.3054	0.3134
	17	0.2229	0.2392	0.2539	0.2670	0.2789	0.2897	0.2995	0.3085	0.3167
	18	0.2244	0.2409	0.2558	0.2691	0.2812	0.2922	0.3022	0.3113	0.3197
	19	0.2257	0.2425	0.2576	0.2711	0.2833	0.2945	0.3046	0.3139	0.3224
	20	0.2270	0.2440	0.2592	0.2729	0.2853	0.2966	0.3069	0.3163	0.3250
	21	0.2281	0.2453	0.2607	0.2745	0.2871	0.2985	0.3090	0.3185	0.3273
	22	0.2292	0.2465	0.2620	0.2761	0.2888	0.3003	0.3109	0.3206	0.3295
	23	0.2302	0.2476	0.2633	0.2775	0.2903	0.3020	0.3127	0.3225	0.3315
	24	0.2311	0.2487	0.2645	0.2788	0.2918	0.3036	0.3144	0.3243	0.3334
	25	0.2320	0.2497	0.2656	0.2800	0.2931	0.3050	0.3160	0.3260	0.3352
	26	0.2328	0.2506	0.2667	0.2812	0.2944	0.3064	0.3174	0.3276	0.3369
	27	0.2335	0.2515	0.2676	0.2823	0.2956	0.3077	0.3188	0.3290	0.3385
	28	0.2342	0.2523	0.2685	0.2833	0.2967	0.3089	0.3201	0.3304	0.3399
	29	0.2348	0.2530	0.2694	0.2842	0.2977	0.3101	0.3213	0.3317	0.3413
	30	0.2355	0.2537	0.2702	0.2851	0.2987	0.3111	0.3225	0.3330	0.3426
40	0.2401	0.2591	0.2763	0.2919	0.3062	0.3193	0.3313	0.3424	0.3527	
60	0.2450	0.2648	0.2828	0.2993	0.3143	0.3282	0.3409	0.3528	0.3637	
120	0.2502	0.2710	0.2899	0.3072	0.3232	0.3379	0.3515	0.3642	0.3760	
$\infty$	0.2558	0.2776	0.2975	0.3159	0.3329	0.3486	0.3633	0.3769	0.3897	

## H

**Critical Values of the  $F$ -Distribution ( $\alpha = 0.990$ ) (cont.)**

		Numerator Degrees of Freedom						
		19	20	24	30	40	60	120
Denominator Degrees of Freedom	1	0.1222	0.1235	0.1278	0.1322	0.1367	0.1413	0.1460
	2	0.1688	0.1710	0.1781	0.1855	0.1931	0.2009	0.2089
	3	0.1996	0.2025	0.2120	0.2217	0.2319	0.2424	0.2532
	4	0.2222	0.2257	0.2371	0.2489	0.2612	0.2740	0.2874
	5	0.2398	0.2437	0.2567	0.2703	0.2846	0.2995	0.3151
	6	0.2539	0.2583	0.2727	0.2879	0.3039	0.3206	0.3383
	7	0.2656	0.2704	0.2860	0.3026	0.3201	0.3386	0.3582
	8	0.2754	0.2806	0.2974	0.3152	0.3341	0.3542	0.3755
	9	0.2839	0.2893	0.3071	0.3261	0.3463	0.3679	0.3908
	10	0.2912	0.2969	0.3156	0.3357	0.3571	0.3800	0.4045
	11	0.2977	0.3036	0.3232	0.3442	0.3667	0.3908	0.4168
	12	0.3033	0.3095	0.3299	0.3517	0.3753	0.4006	0.4280
	13	0.3084	0.3148	0.3359	0.3585	0.3830	0.4095	0.4382
	14	0.3130	0.3195	0.3413	0.3647	0.3901	0.4177	0.4476
	15	0.3171	0.3238	0.3462	0.3703	0.3966	0.4251	0.4563
	16	0.3209	0.3277	0.3506	0.3755	0.4025	0.4320	0.4643
	17	0.3243	0.3313	0.3548	0.3802	0.4080	0.4384	0.4718
	18	0.3274	0.3346	0.3585	0.3846	0.4131	0.4443	0.4788
	19	0.3303	0.3376	0.3620	0.3886	0.4178	0.4498	0.4854
	20	0.3330	0.3404	0.3652	0.3924	0.4221	0.4550	0.4915
	21	0.3355	0.3430	0.3682	0.3959	0.4262	0.4598	0.4973
	22	0.3378	0.3454	0.3710	0.3991	0.4301	0.4644	0.5028
	23	0.3399	0.3476	0.3736	0.4022	0.4337	0.4687	0.5079
	24	0.3419	0.3497	0.3761	0.4050	0.4371	0.4727	0.5128
	25	0.3438	0.3517	0.3784	0.4077	0.4403	0.4766	0.5175
	26	0.3455	0.3535	0.3805	0.4103	0.4433	0.4802	0.5219
	27	0.3472	0.3553	0.3826	0.4127	0.4461	0.4836	0.5261
	28	0.3487	0.3569	0.3845	0.4149	0.4488	0.4869	0.5301
	29	0.3502	0.3584	0.3863	0.4171	0.4514	0.4900	0.5340
	30	0.3516	0.3599	0.3880	0.4191	0.4538	0.4930	0.5376
40	0.3622	0.3711	0.4012	0.4349	0.4730	0.5165	0.5673	
60	0.3739	0.3835	0.4161	0.4529	0.4952	0.5446	0.6040	
120	0.3870	0.3973	0.4329	0.4738	0.5216	0.5793	0.6523	
$\infty$	0.4017	0.4130	0.4523	0.4984	0.5541	0.6247	0.7243	



## H Critical Values of the $F$ -Distribution ( $\alpha = 0.975$ )

		Numerator Degrees of Freedom								
		1	2	3	4	5	6	7	8	9
Denominator Degrees of Freedom	1	0.0015	0.0260	0.0573	0.0818	0.0999	0.1135	0.1239	0.1321	0.1387
	2	0.0013	0.0256	0.0623	0.0939	0.1186	0.1377	0.1529	0.1650	0.1750
	3	0.0012	0.0255	0.0648	0.1002	0.1288	0.1515	0.1698	0.1846	0.1969
	4	0.0011	0.0255	0.0662	0.1041	0.1354	0.1606	0.1811	0.1979	0.2120
	5	0.0011	0.0254	0.0672	0.1068	0.1399	0.1670	0.1892	0.2076	0.2230
	6	0.0011	0.0254	0.0679	0.1087	0.1433	0.1718	0.1954	0.2150	0.2315
	7	0.0011	0.0254	0.0684	0.1102	0.1459	0.1756	0.2002	0.2208	0.2383
	8	0.0010	0.0254	0.0688	0.1114	0.1480	0.1786	0.2041	0.2256	0.2438
	9	0.0010	0.0254	0.0691	0.1123	0.1497	0.1810	0.2073	0.2295	0.2484
	10	0.0010	0.0254	0.0694	0.1131	0.1511	0.1831	0.2100	0.2328	0.2523
	11	0.0010	0.0254	0.0696	0.1137	0.1523	0.1849	0.2123	0.2357	0.2556
	12	0.0010	0.0254	0.0698	0.1143	0.1533	0.1864	0.2143	0.2381	0.2585
	13	0.0010	0.0254	0.0699	0.1147	0.1541	0.1877	0.2161	0.2403	0.2611
	14	0.0010	0.0254	0.0700	0.1152	0.1549	0.1888	0.2176	0.2422	0.2633
	15	0.0010	0.0254	0.0702	0.1155	0.1556	0.1898	0.2189	0.2438	0.2653
	16	0.0010	0.0254	0.0703	0.1158	0.1562	0.1907	0.2201	0.2453	0.2671
	17	0.0010	0.0254	0.0704	0.1161	0.1567	0.1915	0.2212	0.2467	0.2687
	18	0.0010	0.0254	0.0704	0.1164	0.1572	0.1922	0.2222	0.2479	0.2702
	19	0.0010	0.0254	0.0705	0.1166	0.1576	0.1929	0.2231	0.2490	0.2715
	20	0.0010	0.0253	0.0706	0.1168	0.1580	0.1935	0.2239	0.2500	0.2727
	21	0.0010	0.0253	0.0706	0.1170	0.1584	0.1940	0.2246	0.2510	0.2738
	22	0.0010	0.0253	0.0707	0.1172	0.1587	0.1945	0.2253	0.2518	0.2749
	23	0.0010	0.0253	0.0708	0.1173	0.1590	0.1950	0.2259	0.2526	0.2758
	24	0.0010	0.0253	0.0708	0.1175	0.1593	0.1954	0.2265	0.2533	0.2767
	25	0.0010	0.0253	0.0708	0.1176	0.1595	0.1958	0.2270	0.2540	0.2775
	26	0.0010	0.0253	0.0709	0.1178	0.1598	0.1962	0.2275	0.2547	0.2783
	27	0.0010	0.0253	0.0709	0.1179	0.1600	0.1965	0.2280	0.2552	0.2790
	28	0.0010	0.0253	0.0710	0.1180	0.1602	0.1968	0.2284	0.2558	0.2797
	29	0.0010	0.0253	0.0710	0.1181	0.1604	0.1971	0.2288	0.2563	0.2803
	30	0.0010	0.0253	0.0710	0.1182	0.1606	0.1974	0.2292	0.2568	0.2809
40	0.0010	0.0253	0.0712	0.1189	0.1619	0.1995	0.2321	0.2604	0.2853	
60	0.0010	0.0253	0.0715	0.1196	0.1633	0.2017	0.2351	0.2642	0.2899	
120	0.0010	0.0253	0.0717	0.1203	0.1648	0.2039	0.2382	0.2682	0.2948	
$\infty$	0.0010	0.0253	0.0719	0.1211	0.1662	0.2062	0.2414	0.2725	0.3000	

## H

**Critical Values of the *F*-Distribution ( $\alpha = 0.975$ ) (cont.)**

		Numerator Degrees of Freedom								
		10	11	12	13	14	15	16	17	18
Denominator Degrees of Freedom	1	0.1442	0.1487	0.1526	0.1559	0.1588	0.1613	0.1635	0.1655	0.1673
	2	0.1833	0.1903	0.1962	0.2014	0.2059	0.2099	0.2134	0.2165	0.2193
	3	0.2072	0.2160	0.2235	0.2300	0.2358	0.2408	0.2453	0.2493	0.2529
	4	0.2238	0.2339	0.2426	0.2503	0.2569	0.2629	0.2681	0.2729	0.2771
	5	0.2361	0.2473	0.2570	0.2655	0.2730	0.2796	0.2855	0.2909	0.2957
	6	0.2456	0.2577	0.2682	0.2774	0.2856	0.2929	0.2993	0.3052	0.3105
	7	0.2532	0.2661	0.2773	0.2871	0.2959	0.3036	0.3106	0.3169	0.3226
	8	0.2594	0.2729	0.2848	0.2952	0.3044	0.3126	0.3200	0.3267	0.3327
	9	0.2646	0.2787	0.2910	0.3019	0.3116	0.3202	0.3280	0.3350	0.3414
	10	0.2690	0.2836	0.2964	0.3077	0.3178	0.3268	0.3349	0.3422	0.3489
	11	0.2729	0.2879	0.3011	0.3127	0.3231	0.3325	0.3409	0.3485	0.3554
	12	0.2762	0.2916	0.3051	0.3171	0.3279	0.3375	0.3461	0.3540	0.3612
	13	0.2791	0.2948	0.3087	0.3210	0.3320	0.3419	0.3508	0.3589	0.3663
	14	0.2817	0.2977	0.3119	0.3245	0.3357	0.3458	0.3550	0.3633	0.3709
	15	0.2840	0.3003	0.3147	0.3276	0.3391	0.3494	0.3587	0.3672	0.3750
	16	0.2860	0.3026	0.3173	0.3304	0.3421	0.3526	0.3621	0.3708	0.3787
	17	0.2879	0.3047	0.3196	0.3329	0.3448	0.3555	0.3652	0.3741	0.3821
	18	0.2896	0.3066	0.3217	0.3352	0.3473	0.3582	0.3681	0.3770	0.3853
	19	0.2911	0.3084	0.3237	0.3373	0.3496	0.3606	0.3706	0.3798	0.3881
	20	0.2925	0.3100	0.3254	0.3393	0.3517	0.3629	0.3730	0.3823	0.3908
	21	0.2938	0.3114	0.3271	0.3410	0.3536	0.3649	0.3752	0.3846	0.3932
	22	0.2950	0.3128	0.3286	0.3427	0.3554	0.3668	0.3773	0.3868	0.3955
	23	0.2961	0.3140	0.3300	0.3442	0.3570	0.3686	0.3792	0.3888	0.3976
	24	0.2971	0.3152	0.3313	0.3456	0.3586	0.3703	0.3809	0.3907	0.3996
	25	0.2981	0.3163	0.3325	0.3470	0.3600	0.3718	0.3826	0.3924	0.4014
	26	0.2990	0.3173	0.3336	0.3482	0.3614	0.3733	0.3841	0.3940	0.4031
	27	0.2998	0.3183	0.3347	0.3494	0.3626	0.3746	0.3856	0.3956	0.4048
	28	0.3006	0.3191	0.3357	0.3505	0.3638	0.3759	0.3869	0.3970	0.4063
	29	0.3013	0.3200	0.3366	0.3515	0.3649	0.3771	0.3882	0.3984	0.4077
	30	0.3020	0.3208	0.3375	0.3525	0.3660	0.3783	0.3894	0.3997	0.4091
40	0.3072	0.3267	0.3441	0.3598	0.3739	0.3868	0.3986	0.4095	0.4194	
60	0.3127	0.3329	0.3512	0.3676	0.3825	0.3962	0.4087	0.4201	0.4308	
120	0.3185	0.3397	0.3588	0.3761	0.3919	0.4063	0.4196	0.4319	0.4433	
$\infty$	0.3247	0.3469	0.3670	0.3853	0.4021	0.4175	0.4317	0.4450	0.4573	

## H

**Critical Values of the  $F$ -Distribution ( $\alpha = 0.975$ ) (cont.)**

		Numerator Degrees of Freedom						
		19	20	24	30	40	60	120
Denominator Degrees of Freedom	1	0.1689	0.1703	0.1749	0.1796	0.1844	0.1892	0.1941
	2	0.2219	0.2242	0.2315	0.2391	0.2469	0.2548	0.2628
	3	0.2562	0.2592	0.2687	0.2786	0.2887	0.2992	0.3099
	4	0.2810	0.2845	0.2959	0.3077	0.3199	0.3325	0.3455
	5	0.3001	0.3040	0.3170	0.3304	0.3444	0.3589	0.3740
	6	0.3153	0.3197	0.3339	0.3488	0.3644	0.3806	0.3976
	7	0.3278	0.3325	0.3480	0.3642	0.3811	0.3989	0.4176
	8	0.3383	0.3433	0.3598	0.3772	0.3954	0.4147	0.4349
	9	0.3472	0.3525	0.3700	0.3884	0.4078	0.4284	0.4501
	10	0.3550	0.3605	0.3788	0.3982	0.4187	0.4405	0.4636
	11	0.3617	0.3675	0.3866	0.4069	0.4284	0.4513	0.4757
	12	0.3677	0.3737	0.3935	0.4146	0.4370	0.4610	0.4867
	13	0.3730	0.3792	0.3997	0.4215	0.4448	0.4698	0.4966
	14	0.3778	0.3842	0.4052	0.4278	0.4519	0.4778	0.5057
	15	0.3821	0.3886	0.4103	0.4334	0.4583	0.4851	0.5141
	16	0.3860	0.3927	0.4148	0.4386	0.4642	0.4919	0.5219
	17	0.3896	0.3964	0.4190	0.4434	0.4696	0.4981	0.5291
	18	0.3928	0.3998	0.4229	0.4477	0.4747	0.5039	0.5358
	19	0.3958	0.4029	0.4264	0.4518	0.4793	0.5093	0.5421
	20	0.3986	0.4058	0.4297	0.4555	0.4836	0.5143	0.5480
	21	0.4011	0.4084	0.4327	0.4590	0.4877	0.5190	0.5535
	22	0.4035	0.4109	0.4356	0.4623	0.4914	0.5234	0.5587
	23	0.4057	0.4132	0.4382	0.4653	0.4950	0.5275	0.5636
	24	0.4078	0.4154	0.4407	0.4682	0.4983	0.5314	0.5683
	25	0.4097	0.4174	0.4430	0.4709	0.5014	0.5351	0.5727
	26	0.4115	0.4193	0.4452	0.4734	0.5044	0.5386	0.5769
	27	0.4132	0.4210	0.4472	0.4758	0.5072	0.5419	0.5809
	28	0.4148	0.4227	0.4491	0.4780	0.5098	0.5451	0.5847
	29	0.4163	0.4243	0.4510	0.4802	0.5123	0.5481	0.5883
	30	0.4178	0.4258	0.4527	0.4822	0.5147	0.5509	0.5917
40	0.4286	0.4372	0.4660	0.4978	0.5333	0.5734	0.6195	
60	0.4406	0.4498	0.4808	0.5155	0.5547	0.6000	0.6536	
120	0.4539	0.4638	0.4975	0.5358	0.5800	0.6325	0.6980	
$\infty$	0.4688	0.4795	0.5167	0.5597	0.6108	0.6747	0.7631	

## H Critical Values of the *F*-Distribution ( $\alpha = 0.950$ )

		Numerator Degrees of Freedom								
		1	2	3	4	5	6	7	8	9
Denominator Degrees of Freedom	1	0.0062	0.0540	0.0987	0.1297	0.1513	0.1670	0.1788	0.1881	0.1954
	2	0.0050	0.0526	0.1047	0.1440	0.1728	0.1944	0.2111	0.2243	0.2349
	3	0.0046	0.0522	0.1078	0.1517	0.1849	0.2102	0.2301	0.2459	0.2589
	4	0.0045	0.0520	0.1097	0.1565	0.1926	0.2206	0.2427	0.2606	0.2752
	5	0.0043	0.0518	0.1109	0.1598	0.1980	0.2279	0.2518	0.2712	0.2872
	6	0.0043	0.0517	0.1118	0.1623	0.2020	0.2334	0.2587	0.2793	0.2964
	7	0.0042	0.0517	0.1125	0.1641	0.2051	0.2377	0.2641	0.2857	0.3037
	8	0.0042	0.0516	0.1131	0.1655	0.2075	0.2411	0.2684	0.2909	0.3096
	9	0.0042	0.0516	0.1135	0.1667	0.2095	0.2440	0.2720	0.2951	0.3146
	10	0.0041	0.0516	0.1138	0.1677	0.2112	0.2463	0.2750	0.2988	0.3187
	11	0.0041	0.0515	0.1141	0.1685	0.2126	0.2483	0.2775	0.3018	0.3223
	12	0.0041	0.0515	0.1144	0.1692	0.2138	0.2500	0.2797	0.3045	0.3254
	13	0.0041	0.0515	0.1146	0.1697	0.2148	0.2515	0.2817	0.3068	0.3281
	14	0.0041	0.0515	0.1147	0.1703	0.2157	0.2528	0.2833	0.3089	0.3305
	15	0.0041	0.0515	0.1149	0.1707	0.2165	0.2539	0.2848	0.3107	0.3327
	16	0.0041	0.0515	0.1150	0.1711	0.2172	0.2550	0.2862	0.3123	0.3346
	17	0.0040	0.0514	0.1152	0.1715	0.2178	0.2559	0.2874	0.3138	0.3363
	18	0.0040	0.0514	0.1153	0.1718	0.2184	0.2567	0.2884	0.3151	0.3378
	19	0.0040	0.0514	0.1154	0.1721	0.2189	0.2574	0.2894	0.3163	0.3393
	20	0.0040	0.0514	0.1155	0.1723	0.2194	0.2581	0.2903	0.3174	0.3405
	21	0.0040	0.0514	0.1156	0.1726	0.2198	0.2587	0.2911	0.3184	0.3417
	22	0.0040	0.0514	0.1156	0.1728	0.2202	0.2593	0.2919	0.3194	0.3428
	23	0.0040	0.0514	0.1157	0.1730	0.2206	0.2598	0.2926	0.3202	0.3438
	24	0.0040	0.0514	0.1158	0.1732	0.2209	0.2603	0.2932	0.3210	0.3448
	25	0.0040	0.0514	0.1158	0.1733	0.2212	0.2608	0.2938	0.3217	0.3456
	26	0.0040	0.0514	0.1159	0.1735	0.2215	0.2612	0.2944	0.3224	0.3465
	27	0.0040	0.0514	0.1159	0.1737	0.2217	0.2616	0.2949	0.3231	0.3472
	28	0.0040	0.0514	0.1160	0.1738	0.2220	0.2619	0.2954	0.3237	0.3479
	29	0.0040	0.0514	0.1160	0.1739	0.2222	0.2623	0.2958	0.3242	0.3486
	30	0.0040	0.0514	0.1161	0.1740	0.2224	0.2626	0.2962	0.3247	0.3492
40	0.0040	0.0514	0.1164	0.1749	0.2240	0.2650	0.2994	0.3286	0.3539	
60	0.0040	0.0513	0.1167	0.1758	0.2257	0.2674	0.3026	0.3327	0.3588	
120	0.0039	0.0513	0.1170	0.1767	0.2274	0.2699	0.3060	0.3370	0.3640	
$\infty$	0.0039	0.0513	0.1173	0.1777	0.2291	0.2726	0.3096	0.3416	0.3695	

## H

**Critical Values of the *F*-Distribution ( $\alpha = 0.950$ ) (cont.)**

		Numerator Degrees of Freedom								
		10	11	12	13	14	15	16	17	18
Denominator Degrees of Freedom	<b>1</b>	0.2014	0.2064	0.2106	0.2143	0.2174	0.2201	0.2225	0.2247	0.2266
	<b>2</b>	0.2437	0.2511	0.2574	0.2628	0.2675	0.2716	0.2752	0.2784	0.2813
	<b>3</b>	0.2697	0.2788	0.2865	0.2932	0.2991	0.3042	0.3087	0.3128	0.3165
	<b>4</b>	0.2875	0.2979	0.3068	0.3146	0.3213	0.3273	0.3326	0.3373	0.3416
	<b>5</b>	0.3007	0.3121	0.3220	0.3305	0.3380	0.3447	0.3506	0.3559	0.3606
	<b>6</b>	0.3108	0.3231	0.3338	0.3430	0.3512	0.3584	0.3648	0.3706	0.3758
	<b>7</b>	0.3189	0.3320	0.3432	0.3531	0.3618	0.3695	0.3763	0.3825	0.3881
	<b>8</b>	0.3256	0.3392	0.3511	0.3614	0.3706	0.3787	0.3859	0.3925	0.3984
	<b>9</b>	0.3311	0.3453	0.3576	0.3684	0.3780	0.3865	0.3941	0.4009	0.4071
	<b>10</b>	0.3358	0.3504	0.3632	0.3744	0.3843	0.3931	0.4010	0.4082	0.4146
	<b>11</b>	0.3398	0.3549	0.3680	0.3796	0.3898	0.3989	0.4071	0.4145	0.4212
	<b>12</b>	0.3433	0.3587	0.3722	0.3841	0.3946	0.4040	0.4124	0.4201	0.4270
	<b>13</b>	0.3464	0.3621	0.3759	0.3881	0.3988	0.4085	0.4171	0.4250	0.4321
	<b>14</b>	0.3491	0.3651	0.3792	0.3916	0.4026	0.4125	0.4214	0.4294	0.4367
	<b>15</b>	0.3515	0.3678	0.3821	0.3948	0.4060	0.4161	0.4251	0.4333	0.4408
	<b>16</b>	0.3537	0.3702	0.3848	0.3976	0.4091	0.4193	0.4285	0.4369	0.4445
	<b>17</b>	0.3556	0.3724	0.3872	0.4002	0.4118	0.4222	0.4316	0.4402	0.4479
	<b>18</b>	0.3574	0.3744	0.3893	0.4026	0.4144	0.4249	0.4345	0.4431	0.4510
	<b>19</b>	0.3590	0.3762	0.3913	0.4047	0.4167	0.4274	0.4371	0.4459	0.4539
	<b>20</b>	0.3605	0.3779	0.3931	0.4067	0.4188	0.4296	0.4395	0.4484	0.4565
	<b>21</b>	0.3618	0.3794	0.3948	0.4085	0.4207	0.4317	0.4417	0.4507	0.4589
	<b>22</b>	0.3631	0.3808	0.3964	0.4102	0.4225	0.4336	0.4437	0.4528	0.4612
	<b>23</b>	0.3643	0.3821	0.3978	0.4117	0.4242	0.4354	0.4456	0.4548	0.4632
	<b>24</b>	0.3653	0.3833	0.3991	0.4132	0.4258	0.4371	0.4473	0.4567	0.4652
	<b>25</b>	0.3663	0.3844	0.4004	0.4145	0.4272	0.4386	0.4490	0.4584	0.4670
	<b>26</b>	0.3673	0.3855	0.4015	0.4158	0.4286	0.4401	0.4505	0.4600	0.4687
	<b>27</b>	0.3681	0.3864	0.4026	0.4170	0.4299	0.4415	0.4520	0.4616	0.4703
	<b>28</b>	0.3689	0.3874	0.4036	0.4181	0.4311	0.4427	0.4533	0.4630	0.4718
	<b>29</b>	0.3697	0.3882	0.4046	0.4191	0.4322	0.4439	0.4546	0.4643	0.4732
	<b>30</b>	0.3704	0.3890	0.4055	0.4201	0.4332	0.4451	0.4558	0.4656	0.4746
<b>40</b>	0.3758	0.3951	0.4122	0.4275	0.4412	0.4537	0.4650	0.4753	0.4848	
<b>60</b>	0.3815	0.4016	0.4194	0.4354	0.4499	0.4629	0.4749	0.4858	0.4959	
<b>120</b>	0.3876	0.4085	0.4272	0.4440	0.4592	0.4730	0.4857	0.4973	0.5081	
$\infty$	0.3940	0.4159	0.4355	0.4532	0.4693	0.4841	0.4976	0.5101	0.5217	

## H

**Critical Values of the *F*-Distribution ( $\alpha = 0.950$ ) (cont.)**

		Numerator Degrees of Freedom						
		19	20	24	30	40	60	120
Denominator Degrees of Freedom	1	0.2283	0.2298	0.2348	0.2398	0.2448	0.2499	0.2551
	2	0.2839	0.2863	0.2939	0.3016	0.3094	0.3174	0.3255
	3	0.3198	0.3227	0.3324	0.3422	0.3523	0.3626	0.3731
	4	0.3454	0.3489	0.3602	0.3718	0.3837	0.3960	0.4086
	5	0.3650	0.3689	0.3816	0.3947	0.4083	0.4222	0.4367
	6	0.3805	0.3848	0.3987	0.4131	0.4281	0.4436	0.4598
	7	0.3932	0.3978	0.4128	0.4284	0.4446	0.4616	0.4792
	8	0.4038	0.4087	0.4246	0.4413	0.4587	0.4769	0.4959
	9	0.4128	0.4179	0.4347	0.4523	0.4708	0.4902	0.5105
	10	0.4205	0.4259	0.4435	0.4620	0.4814	0.5019	0.5234
	11	0.4273	0.4329	0.4512	0.4705	0.4908	0.5122	0.5350
	12	0.4333	0.4391	0.4580	0.4780	0.4991	0.5215	0.5453
	13	0.4386	0.4445	0.4641	0.4847	0.5066	0.5299	0.5548
	14	0.4433	0.4494	0.4695	0.4908	0.5134	0.5376	0.5634
	15	0.4476	0.4539	0.4745	0.4963	0.5196	0.5445	0.5713
	16	0.4515	0.4579	0.4789	0.5013	0.5253	0.5509	0.5785
	17	0.4550	0.4615	0.4830	0.5059	0.5305	0.5568	0.5853
	18	0.4582	0.4649	0.4868	0.5102	0.5353	0.5623	0.5916
	19	0.4612	0.4679	0.4902	0.5141	0.5397	0.5674	0.5974
	20	0.4639	0.4708	0.4934	0.5177	0.5438	0.5721	0.6029
	21	0.4665	0.4734	0.4964	0.5210	0.5477	0.5765	0.6080
	22	0.4688	0.4758	0.4991	0.5242	0.5512	0.5806	0.6129
	23	0.4710	0.4781	0.5017	0.5271	0.5546	0.5845	0.6174
	24	0.4730	0.4802	0.5041	0.5298	0.5577	0.5882	0.6217
	25	0.4749	0.4822	0.5063	0.5324	0.5607	0.5916	0.6258
	26	0.4767	0.4840	0.5084	0.5348	0.5635	0.5949	0.6297
	27	0.4784	0.4858	0.5104	0.5371	0.5661	0.5980	0.6333
	28	0.4799	0.4874	0.5123	0.5393	0.5686	0.6009	0.6368
	29	0.4814	0.4890	0.5141	0.5413	0.5710	0.6037	0.6402
	30	0.4828	0.4904	0.5157	0.5432	0.5733	0.6064	0.6434
40	0.4935	0.5016	0.5286	0.5581	0.5907	0.6272	0.6688	
60	0.5052	0.5138	0.5428	0.5749	0.6108	0.6518	0.6998	
120	0.5181	0.5273	0.5588	0.5940	0.6343	0.6815	0.7397	
$\infty$	0.5325	0.5425	0.5770	0.6164	0.6627	0.7198	0.7975	

## H Critical Values of the $F$ -Distribution ( $\alpha = 0.900$ )

		Numerator Degrees of Freedom								
		1	2	3	4	5	6	7	8	9
Denominator Degrees of Freedom	1	0.0251	0.1173	0.1806	0.2200	0.2463	0.2648	0.2786	0.2892	0.2976
	2	0.0202	0.1111	0.1831	0.2312	0.2646	0.2887	0.3070	0.3212	0.3326
	3	0.0187	0.1091	0.1855	0.2386	0.2763	0.3041	0.3253	0.3420	0.3555
	4	0.0179	0.1082	0.1872	0.2435	0.2841	0.3144	0.3378	0.3563	0.3714
	5	0.0175	0.1076	0.1884	0.2469	0.2896	0.3218	0.3468	0.3668	0.3831
	6	0.0172	0.1072	0.1892	0.2494	0.2937	0.3274	0.3537	0.3748	0.3920
	7	0.0170	0.1070	0.1899	0.2513	0.2969	0.3317	0.3591	0.3811	0.3992
	8	0.0168	0.1068	0.1904	0.2528	0.2995	0.3352	0.3634	0.3862	0.4050
	9	0.0167	0.1066	0.1908	0.2541	0.3015	0.3381	0.3670	0.3904	0.4098
	10	0.0166	0.1065	0.1912	0.2551	0.3033	0.3405	0.3700	0.3940	0.4139
	11	0.0165	0.1064	0.1915	0.2560	0.3047	0.3425	0.3726	0.3971	0.4173
	12	0.0165	0.1063	0.1917	0.2567	0.3060	0.3443	0.3748	0.3997	0.4204
	13	0.0164	0.1062	0.1919	0.2573	0.3071	0.3458	0.3767	0.4020	0.4230
	14	0.0164	0.1062	0.1921	0.2579	0.3080	0.3471	0.3784	0.4040	0.4253
	15	0.0163	0.1061	0.1923	0.2584	0.3088	0.3483	0.3799	0.4058	0.4274
	16	0.0163	0.1061	0.1924	0.2588	0.3096	0.3493	0.3812	0.4074	0.4293
	17	0.0163	0.1060	0.1926	0.2592	0.3102	0.3503	0.3824	0.4089	0.4309
	18	0.0162	0.1060	0.1927	0.2595	0.3108	0.3511	0.3835	0.4102	0.4325
	19	0.0162	0.1059	0.1928	0.2598	0.3114	0.3519	0.3845	0.4114	0.4338
	20	0.0162	0.1059	0.1929	0.2601	0.3119	0.3526	0.3854	0.4124	0.4351
	21	0.0162	0.1059	0.1930	0.2604	0.3123	0.3532	0.3862	0.4134	0.4363
	22	0.0162	0.1059	0.1930	0.2606	0.3127	0.3538	0.3870	0.4143	0.4373
	23	0.0161	0.1058	0.1931	0.2608	0.3131	0.3543	0.3877	0.4152	0.4383
	24	0.0161	0.1058	0.1932	0.2610	0.3134	0.3548	0.3883	0.4160	0.4392
	25	0.0161	0.1058	0.1932	0.2612	0.3137	0.3553	0.3889	0.4167	0.4401
	26	0.0161	0.1058	0.1933	0.2614	0.3140	0.3557	0.3894	0.4174	0.4408
	27	0.0161	0.1058	0.1934	0.2615	0.3143	0.3561	0.3900	0.4180	0.4416
	28	0.0161	0.1058	0.1934	0.2617	0.3146	0.3565	0.3904	0.4186	0.4423
	29	0.0161	0.1057	0.1935	0.2618	0.3148	0.3568	0.3909	0.4191	0.4429
	30	0.0161	0.1057	0.1935	0.2620	0.3151	0.3571	0.3913	0.4196	0.4435
40	0.0160	0.1056	0.1938	0.2629	0.3167	0.3596	0.3945	0.4235	0.4480	
60	0.0159	0.1055	0.1941	0.2639	0.3184	0.3621	0.3977	0.4275	0.4528	
120	0.0159	0.1055	0.1945	0.2649	0.3202	0.3647	0.4012	0.4317	0.4578	
$\infty$	0.0158	0.1054	0.1948	0.2659	0.3221	0.3674	0.4047	0.4362	0.4631	

## H Critical Values of the *F*-Distribution ( $\alpha = 0.900$ ) (cont.)

		Numerator Degrees of Freedom								
		10	11	12	13	14	15	16	17	18
Denominator Degrees of Freedom	1	0.3044	0.3101	0.3148	0.3189	0.3224	0.3254	0.3281	0.3304	0.3326
	2	0.3419	0.3497	0.3563	0.3619	0.3668	0.3710	0.3748	0.3781	0.3811
	3	0.3666	0.3759	0.3838	0.3906	0.3965	0.4016	0.4062	0.4103	0.4139
	4	0.3838	0.3943	0.4032	0.4109	0.4176	0.4235	0.4287	0.4333	0.4375
	5	0.3966	0.4080	0.4177	0.4261	0.4335	0.4399	0.4457	0.4508	0.4554
	6	0.4064	0.4186	0.4290	0.4380	0.4459	0.4529	0.4591	0.4646	0.4696
	7	0.4143	0.4271	0.4381	0.4476	0.4560	0.4634	0.4699	0.4758	0.4811
	8	0.4207	0.4340	0.4455	0.4555	0.4643	0.4720	0.4789	0.4851	0.4907
	9	0.4260	0.4399	0.4518	0.4621	0.4713	0.4793	0.4865	0.4930	0.4988
	10	0.4306	0.4448	0.4571	0.4678	0.4772	0.4856	0.4931	0.4998	0.5058
	11	0.4344	0.4490	0.4617	0.4727	0.4824	0.4910	0.4987	0.5056	0.5119
	12	0.4378	0.4527	0.4657	0.4770	0.4869	0.4958	0.5037	0.5108	0.5172
	13	0.4408	0.4560	0.4692	0.4807	0.4909	0.5000	0.5081	0.5154	0.5220
	14	0.4434	0.4589	0.4723	0.4841	0.4945	0.5037	0.5120	0.5194	0.5262
	15	0.4457	0.4614	0.4751	0.4871	0.4976	0.5070	0.5155	0.5231	0.5300
	16	0.4478	0.4638	0.4776	0.4897	0.5005	0.5101	0.5187	0.5264	0.5334
	17	0.4497	0.4658	0.4799	0.4922	0.5031	0.5128	0.5215	0.5294	0.5365
	18	0.4514	0.4677	0.4819	0.4944	0.5054	0.5153	0.5241	0.5321	0.5394
	19	0.4530	0.4694	0.4838	0.4964	0.5076	0.5176	0.5265	0.5346	0.5420
	20	0.4544	0.4710	0.4855	0.4983	0.5096	0.5197	0.5287	0.5370	0.5444
	21	0.4557	0.4725	0.4871	0.5000	0.5114	0.5216	0.5308	0.5391	0.5466
	22	0.4569	0.4738	0.4886	0.5015	0.5131	0.5234	0.5327	0.5411	0.5487
	23	0.4580	0.4750	0.4899	0.5030	0.5146	0.5250	0.5344	0.5429	0.5506
	24	0.4590	0.4762	0.4912	0.5044	0.5161	0.5266	0.5360	0.5446	0.5524
	25	0.4600	0.4773	0.4923	0.5056	0.5174	0.5280	0.5375	0.5462	0.5540
	26	0.4609	0.4783	0.4934	0.5068	0.5187	0.5294	0.5390	0.5477	0.5556
	27	0.4617	0.4792	0.4944	0.5079	0.5199	0.5306	0.5403	0.5491	0.5571
	28	0.4625	0.4801	0.4954	0.5089	0.5210	0.5318	0.5415	0.5504	0.5584
	29	0.4633	0.4809	0.4963	0.5099	0.5220	0.5329	0.5427	0.5516	0.5597
	30	0.4639	0.4816	0.4971	0.5108	0.5230	0.5340	0.5438	0.5528	0.5610
40	0.4691	0.4874	0.5035	0.5177	0.5305	0.5419	0.5522	0.5616	0.5702	
60	0.4746	0.4936	0.5103	0.5251	0.5384	0.5504	0.5613	0.5712	0.5803	
120	0.4804	0.5001	0.5175	0.5331	0.5470	0.5597	0.5712	0.5817	0.5914	
$\infty$	0.4865	0.5071	0.5253	0.5417	0.5564	0.5698	0.5820	0.5932	0.6036	



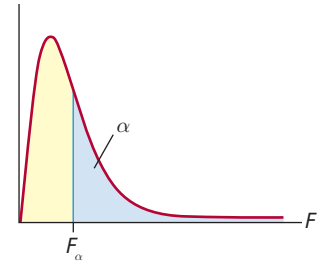
## H

**Critical Values of the  $F$ -Distribution ( $\alpha = 0.900$ ) (cont.)**

		Numerator Degrees of Freedom						
		19	20	24	30	40	60	120
Denominator Degrees of Freedom	1	0.3345	0.3362	0.3416	0.3471	0.3527	0.3583	0.3639
	2	0.3838	0.3862	0.3940	0.4018	0.4098	0.4178	0.4260
	3	0.4172	0.4202	0.4297	0.4394	0.4492	0.4593	0.4695
	4	0.4412	0.4447	0.4556	0.4668	0.4783	0.4900	0.5019
	5	0.4596	0.4633	0.4755	0.4880	0.5008	0.5140	0.5275
	6	0.4741	0.4782	0.4914	0.5050	0.5190	0.5334	0.5483
	7	0.4859	0.4903	0.5044	0.5190	0.5340	0.5496	0.5658
	8	0.4958	0.5004	0.5153	0.5308	0.5468	0.5634	0.5807
	9	0.5041	0.5089	0.5246	0.5408	0.5578	0.5754	0.5937
	10	0.5113	0.5163	0.5326	0.5496	0.5673	0.5858	0.6052
	11	0.5176	0.5228	0.5397	0.5573	0.5757	0.5951	0.6154
	12	0.5231	0.5284	0.5459	0.5641	0.5832	0.6033	0.6245
	13	0.5280	0.5335	0.5514	0.5702	0.5900	0.6108	0.6328
	14	0.5323	0.5380	0.5564	0.5757	0.5960	0.6175	0.6403
	15	0.5363	0.5420	0.5608	0.5806	0.6015	0.6237	0.6472
	16	0.5398	0.5457	0.5649	0.5851	0.6066	0.6293	0.6536
	17	0.5431	0.5490	0.5686	0.5893	0.6112	0.6345	0.6595
	18	0.5460	0.5521	0.5720	0.5930	0.6154	0.6393	0.6649
	19	0.5487	0.5549	0.5751	0.5965	0.6194	0.6437	0.6700
	20	0.5512	0.5575	0.5780	0.5998	0.6230	0.6479	0.6747
	21	0.5535	0.5598	0.5807	0.6028	0.6264	0.6517	0.6792
	22	0.5557	0.5621	0.5831	0.6056	0.6295	0.6554	0.6833
	23	0.5576	0.5641	0.5854	0.6082	0.6325	0.6587	0.6873
	24	0.5595	0.5660	0.5876	0.6106	0.6353	0.6619	0.6910
	25	0.5612	0.5678	0.5896	0.6129	0.6379	0.6649	0.6945
	26	0.5629	0.5695	0.5915	0.6150	0.6403	0.6678	0.6978
	27	0.5644	0.5711	0.5933	0.6171	0.6427	0.6705	0.7010
	28	0.5658	0.5726	0.5950	0.6190	0.6449	0.6730	0.7040
	29	0.5672	0.5740	0.5966	0.6208	0.6469	0.6754	0.7068
	30	0.5684	0.5753	0.5980	0.6225	0.6489	0.6777	0.7095
40	0.5781	0.5854	0.6095	0.6356	0.6642	0.6957	0.7312	
60	0.5887	0.5964	0.6222	0.6504	0.6816	0.7167	0.7574	
120	0.6003	0.6085	0.6364	0.6672	0.7019	0.7421	0.7908	
$\infty$	0.6132	0.6221	0.6524	0.6866	0.7263	0.7743	0.8385	

# H Critical Values of the *F*-Distribution ( $\alpha = 0.100$ )

Numerical entries represent the value of  $F_\alpha$ .



		Numerator Degrees of Freedom								
		1	2	3	4	5	6	7	8	9
Denominator Degrees of Freedom	1	39.8635	49.5000	53.5932	55.8330	57.2401	58.2044	58.9060	59.4390	59.8576
	2	8.5263	9.0000	9.1618	9.2434	9.2926	9.3255	9.3491	9.3668	9.3805
	3	5.5383	5.4624	5.3908	5.3426	5.3092	5.2847	5.2662	5.2517	5.2400
	4	4.5448	4.3246	4.1909	4.1072	4.0506	4.0097	3.9790	3.9549	3.9357
	5	4.0604	3.7797	3.6195	3.5202	3.4530	3.4045	3.3679	3.3393	3.3163
	6	3.7759	3.4633	3.2888	3.1808	3.1075	3.0546	3.0145	2.9830	2.9577
	7	3.5894	3.2574	3.0741	2.9605	2.8833	2.8274	2.7849	2.7516	2.7247
	8	3.4579	3.1131	2.9238	2.8064	2.7264	2.6683	2.6241	2.5893	2.5612
	9	3.3603	3.0065	2.8129	2.6927	2.6106	2.5509	2.5053	2.4694	2.4403
	10	3.2850	2.9245	2.7277	2.6053	2.5216	2.4606	2.4140	2.3772	2.3473
	11	3.2252	2.8595	2.6602	2.5362	2.4512	2.3891	2.3416	2.3040	2.2735
	12	3.1765	2.8068	2.6055	2.4801	2.3940	2.3310	2.2828	2.2446	2.2135
	13	3.1362	2.7632	2.5603	2.4337	2.3467	2.2830	2.2341	2.1953	2.1638
	14	3.1022	2.7265	2.5222	2.3947	2.3069	2.2426	2.1931	2.1539	2.1220
	15	3.0732	2.6952	2.4898	2.3614	2.2730	2.2081	2.1582	2.1185	2.0862
	16	3.0481	2.6682	2.4618	2.3327	2.2438	2.1783	2.1280	2.0880	2.0553
	17	3.0262	2.6446	2.4374	2.3077	2.2183	2.1524	2.1017	2.0613	2.0284
	18	3.0070	2.6239	2.4160	2.2858	2.1958	2.1296	2.0785	2.0379	2.0047
	19	2.9899	2.6056	2.3970	2.2663	2.1760	2.1094	2.0580	2.0171	1.9836
	20	2.9747	2.5893	2.3801	2.2489	2.1582	2.0913	2.0397	1.9985	1.9649
	21	2.9610	2.5746	2.3649	2.2333	2.1423	2.0751	2.0233	1.9819	1.9480
	22	2.9486	2.5613	2.3512	2.2193	2.1279	2.0605	2.0084	1.9668	1.9327
	23	2.9374	2.5493	2.3387	2.2065	2.1149	2.0472	1.9949	1.9531	1.9189
	24	2.9271	2.5383	2.3274	2.1949	2.1030	2.0351	1.9826	1.9407	1.9063
	25	2.9177	2.5283	2.3170	2.1842	2.0922	2.0241	1.9714	1.9292	1.8947
	26	2.9091	2.5191	2.3075	2.1745	2.0822	2.0139	1.9610	1.9188	1.8841
	27	2.9012	2.5106	2.2987	2.1655	2.0730	2.0045	1.9515	1.9091	1.8743
	28	2.8938	2.5028	2.2906	2.1571	2.0645	1.9959	1.9427	1.9001	1.8652
	29	2.8870	2.4955	2.2831	2.1494	2.0566	1.9878	1.9345	1.8918	1.8568
	30	2.8807	2.4887	2.2761	2.1422	2.0492	1.9803	1.9269	1.8841	1.8490
40	2.8354	2.4404	2.2261	2.0909	1.9968	1.9269	1.8725	1.8289	1.7929	
60	2.7911	2.3933	2.1774	2.0410	1.9457	1.8747	1.8194	1.7748	1.7380	
120	2.7478	2.3473	2.1300	1.9923	1.8959	1.8238	1.7675	1.7220	1.6842	
∞	2.7055	2.3026	2.0838	1.9449	1.8473	1.7741	1.7167	1.6702	1.6315	

## H

**Critical Values of the  $F$ -Distribution ( $\alpha = 0.100$ ) (cont.)**

		Numerator Degrees of Freedom								
		10	11	12	13	14	15	16	17	18
Denominator Degrees of Freedom	<b>1</b>	60.1950	60.4727	60.7052	60.9028	61.0727	61.2203	61.3499	61.4644	61.5664
	<b>2</b>	9.3916	9.4006	9.4081	9.4145	9.4200	9.4247	9.4289	9.4325	9.4358
	<b>3</b>	5.2304	5.2224	5.2156	5.2098	5.2047	5.2003	5.1964	5.1929	5.1898
	<b>4</b>	3.9199	3.9067	3.8955	3.8859	3.8776	3.8704	3.8639	3.8582	3.8531
	<b>5</b>	3.2974	3.2816	3.2682	3.2567	3.2468	3.2380	3.2303	3.2234	3.2172
	<b>6</b>	2.9369	2.9195	2.9047	2.8920	2.8809	2.8712	2.8626	2.8550	2.8481
	<b>7</b>	2.7025	2.6839	2.6681	2.6545	2.6426	2.6322	2.6230	2.6148	2.6074
	<b>8</b>	2.5380	2.5186	2.5020	2.4876	2.4752	2.4642	2.4545	2.4458	2.4380
	<b>9</b>	2.4163	2.3961	2.3789	2.3640	2.3510	2.3396	2.3295	2.3205	2.3123
	<b>10</b>	2.3226	2.3018	2.2841	2.2687	2.2553	2.2435	2.2330	2.2237	2.2153
	<b>11</b>	2.2482	2.2269	2.2087	2.1930	2.1792	2.1671	2.1563	2.1467	2.1380
	<b>12</b>	2.1878	2.1660	2.1474	2.1313	2.1173	2.1049	2.0938	2.0839	2.0750
	<b>13</b>	2.1376	2.1155	2.0966	2.0802	2.0658	2.0532	2.0419	2.0318	2.0227
	<b>14</b>	2.0954	2.0729	2.0537	2.0370	2.0224	2.0095	1.9981	1.9878	1.9785
	<b>15</b>	2.0593	2.0366	2.0171	2.0001	1.9853	1.9722	1.9605	1.9501	1.9407
	<b>16</b>	2.0281	2.0051	1.9854	1.9682	1.9532	1.9399	1.9281	1.9175	1.9079
	<b>17</b>	2.0009	1.9777	1.9577	1.9404	1.9252	1.9117	1.8997	1.8889	1.8792
	<b>18</b>	1.9770	1.9535	1.9333	1.9158	1.9004	1.8868	1.8747	1.8638	1.8539
	<b>19</b>	1.9557	1.9321	1.9117	1.8940	1.8785	1.8647	1.8524	1.8414	1.8314
	<b>20</b>	1.9367	1.9129	1.8924	1.8745	1.8588	1.8449	1.8325	1.8214	1.8113
	<b>21</b>	1.9197	1.8956	1.8750	1.8570	1.8412	1.8271	1.8146	1.8034	1.7932
	<b>22</b>	1.9043	1.8801	1.8593	1.8411	1.8252	1.8111	1.7984	1.7871	1.7768
	<b>23</b>	1.8903	1.8659	1.8450	1.8267	1.8107	1.7964	1.7837	1.7723	1.7619
	<b>24</b>	1.8775	1.8530	1.8319	1.8136	1.7974	1.7831	1.7703	1.7587	1.7483
	<b>25</b>	1.8658	1.8412	1.8200	1.8015	1.7853	1.7708	1.7579	1.7463	1.7358
	<b>26</b>	1.8550	1.8303	1.8090	1.7904	1.7741	1.7596	1.7466	1.7349	1.7243
	<b>27</b>	1.8451	1.8203	1.7989	1.7802	1.7638	1.7492	1.7361	1.7243	1.7137
	<b>28</b>	1.8359	1.8110	1.7895	1.7708	1.7542	1.7395	1.7264	1.7146	1.7039
	<b>29</b>	1.8274	1.8024	1.7808	1.7620	1.7454	1.7306	1.7174	1.7055	1.6947
	<b>30</b>	1.8195	1.7944	1.7727	1.7538	1.7371	1.7223	1.7090	1.6970	1.6862
<b>40</b>	1.7627	1.7369	1.7146	1.6950	1.6778	1.6624	1.6486	1.6362	1.6249	
<b>60</b>	1.7070	1.6805	1.6574	1.6372	1.6193	1.6034	1.5890	1.5760	1.5642	
<b>120</b>	1.6524	1.6250	1.6012	1.5803	1.5617	1.5450	1.5300	1.5164	1.5039	
$\infty$	1.5987	1.5705	1.5458	1.5240	1.5046	1.4871	1.4714	1.4570	1.4439	

## H Critical Values of the $F$ -Distribution ( $\alpha = 0.100$ ) (cont.)

		Numerator Degrees of Freedom						
		19	20	24	30	40	60	120
Denominator Degrees of Freedom	1	61.6579	61.7403	62.0020	62.2650	62.5291	62.7943	63.0606
	2	9.4387	9.4413	9.4496	9.4579	9.4662	9.4746	9.4829
	3	5.1870	5.1845	5.1764	5.1681	5.1597	5.1512	5.1425
	4	3.8485	3.8443	3.8310	3.8174	3.8036	3.7896	3.7753
	5	3.2117	3.2067	3.1905	3.1741	3.1573	3.1402	3.1228
	6	2.8419	2.8363	2.8183	2.8000	2.7812	2.7620	2.7423
	7	2.6008	2.5947	2.5753	2.5555	2.5351	2.5142	2.4928
	8	2.4310	2.4246	2.4041	2.3830	2.3614	2.3391	2.3162
	9	2.3050	2.2983	2.2768	2.2547	2.2320	2.2085	2.1843
	10	2.2077	2.2007	2.1784	2.1554	2.1317	2.1072	2.0818
	11	2.1302	2.1230	2.1000	2.0762	2.0516	2.0261	1.9997
	12	2.0670	2.0597	2.0360	2.0115	1.9861	1.9597	1.9323
	13	2.0145	2.0070	1.9827	1.9576	1.9315	1.9043	1.8759
	14	1.9701	1.9625	1.9377	1.9119	1.8852	1.8572	1.8280
	15	1.9321	1.9243	1.8990	1.8728	1.8454	1.8168	1.7867
	16	1.8992	1.8913	1.8656	1.8388	1.8108	1.7816	1.7507
	17	1.8704	1.8624	1.8362	1.8090	1.7805	1.7506	1.7191
	18	1.8450	1.8368	1.8103	1.7827	1.7537	1.7232	1.6910
	19	1.8224	1.8142	1.7873	1.7592	1.7298	1.6988	1.6659
	20	1.8022	1.7938	1.7667	1.7382	1.7083	1.6768	1.6433
	21	1.7840	1.7756	1.7481	1.7193	1.6890	1.6569	1.6228
	22	1.7675	1.7590	1.7312	1.7021	1.6714	1.6389	1.6041
	23	1.7525	1.7439	1.7159	1.6864	1.6554	1.6224	1.5871
	24	1.7388	1.7302	1.7019	1.6721	1.6407	1.6073	1.5715
	25	1.7263	1.7175	1.6890	1.6589	1.6272	1.5934	1.5570
	26	1.7147	1.7059	1.6771	1.6468	1.6147	1.5805	1.5437
	27	1.7040	1.6951	1.6662	1.6356	1.6032	1.5686	1.5313
	28	1.6941	1.6852	1.6560	1.6252	1.5925	1.5575	1.5198
	29	1.6849	1.6759	1.6465	1.6155	1.5825	1.5472	1.5090
	30	1.6763	1.6673	1.6377	1.6065	1.5732	1.5376	1.4989
	40	1.6146	1.6052	1.5741	1.5411	1.5056	1.4672	1.4248
	60	1.5534	1.5435	1.5107	1.4755	1.4373	1.3952	1.3476
120	1.4926	1.4821	1.4472	1.4094	1.3676	1.3203	1.2646	
$\infty$	1.4318	1.4206	1.3832	1.3419	1.2951	1.2400	1.1686	

## H

### Critical Values of the *F*-Distribution ( $\alpha = 0.050$ )

		Numerator Degrees of Freedom								
		1	2	3	4	5	6	7	8	9
Denominator Degrees of Freedom	1	161.4476	199.5000	215.7073	224.5832	230.1619	233.9860	236.7684	238.8827	240.5433
	2	18.5128	19.0000	19.1643	19.2468	19.2964	19.3295	19.3532	19.3710	19.3848
	3	10.1280	9.5521	9.2766	9.1172	9.0135	8.9406	8.8867	8.8452	8.8123
	4	7.7086	6.9443	6.5914	6.3882	6.2561	6.1631	6.0942	6.0410	5.9988
	5	6.6079	5.7861	5.4095	5.1922	5.0503	4.9503	4.8759	4.8183	4.7725
	6	5.9874	5.1433	4.7571	4.5337	4.3874	4.2839	4.2067	4.1468	4.0990
	7	5.5914	4.7374	4.3468	4.1203	3.9715	3.8660	3.7870	3.7257	3.6767
	8	5.3177	4.4590	4.0662	3.8379	3.6875	3.5806	3.5005	3.4381	3.3881
	9	5.1174	4.2565	3.8625	3.6331	3.4817	3.3738	3.2927	3.2296	3.1789
	10	4.9646	4.1028	3.7083	3.4780	3.3258	3.2172	3.1355	3.0717	3.0204
	11	4.8443	3.9823	3.5874	3.3567	3.2039	3.0946	3.0123	2.9480	2.8962
	12	4.7472	3.8853	3.4903	3.2592	3.1059	2.9961	2.9134	2.8486	2.7964
	13	4.6672	3.8056	3.4105	3.1791	3.0254	2.9153	2.8321	2.7669	2.7144
	14	4.6001	3.7389	3.3439	3.1122	2.9582	2.8477	2.7642	2.6987	2.6458
	15	4.5431	3.6823	3.2874	3.0556	2.9013	2.7905	2.7066	2.6408	2.5876
	16	4.4940	3.6337	3.2389	3.0069	2.8524	2.7413	2.6572	2.5911	2.5377
	17	4.4513	3.5915	3.1968	2.9647	2.8100	2.6987	2.6143	2.5480	2.4943
	18	4.4139	3.5546	3.1599	2.9277	2.7729	2.6613	2.5767	2.5102	2.4563
	19	4.3807	3.5219	3.1274	2.8951	2.7401	2.6283	2.5435	2.4768	2.4227
	20	4.3512	3.4928	3.0984	2.8661	2.7109	2.5990	2.5140	2.4471	2.3928
	21	4.3248	3.4668	3.0725	2.8401	2.6848	2.5727	2.4876	2.4205	2.3660
	22	4.3009	3.4434	3.0491	2.8167	2.6613	2.5491	2.4638	2.3965	2.3419
	23	4.2793	3.4221	3.0280	2.7955	2.6400	2.5277	2.4422	2.3748	2.3201
	24	4.2597	3.4028	3.0088	2.7763	2.6207	2.5082	2.4226	2.3551	2.3002
	25	4.2417	3.3852	2.9912	2.7587	2.6030	2.4904	2.4047	2.3371	2.2821
	26	4.2252	3.3690	2.9752	2.7426	2.5868	2.4741	2.3883	2.3205	2.2655
	27	4.2100	3.3541	2.9604	2.7278	2.5719	2.4591	2.3732	2.3053	2.2501
	28	4.1960	3.3404	2.9467	2.7141	2.5581	2.4453	2.3593	2.2913	2.2360
	29	4.1830	3.3277	2.9340	2.7014	2.5454	2.4324	2.3463	2.2783	2.2229
	30	4.1709	3.3158	2.9223	2.6896	2.5336	2.4205	2.3343	2.2662	2.2107
40	4.0847	3.2317	2.8387	2.6060	2.4495	2.3359	2.2490	2.1802	2.1240	
60	4.0012	3.1504	2.7581	2.5252	2.3683	2.2541	2.1665	2.0970	2.0401	
120	3.9201	3.0718	2.6802	2.4472	2.2899	2.1750	2.0868	2.0164	1.9588	
$\infty$	3.8415	2.9957	2.6049	2.3719	2.2141	2.0986	2.0096	1.9384	1.8799	

## H

**Critical Values of the *F*-Distribution ( $\alpha = 0.050$ ) (cont.)**

		Numerator Degrees of Freedom								
		10	11	12	13	14	15	16	17	18
Denominator Degrees of Freedom	1	241.8817	242.9835	243.9060	244.6898	245.3640	245.9499	246.4639	246.9184	247.3232
	2	19.3959	19.4050	19.4125	19.4189	19.4244	19.4291	19.4333	19.4370	19.4402
	3	8.7855	8.7633	8.7446	8.7287	8.7149	8.7029	8.6923	8.6829	8.6745
	4	5.9644	5.9358	5.9117	5.8911	5.8733	5.8578	5.8441	5.8320	5.8211
	5	4.7351	4.7040	4.6777	4.6552	4.6358	4.6188	4.6038	4.5904	4.5785
	6	4.0600	4.0274	3.9999	3.9764	3.9559	3.9381	3.9223	3.9083	3.8957
	7	3.6365	3.6030	3.5747	3.5503	3.5292	3.5107	3.4944	3.4799	3.4669
	8	3.3472	3.3130	3.2839	3.2590	3.2374	3.2184	3.2016	3.1867	3.1733
	9	3.1373	3.1025	3.0729	3.0475	3.0255	3.0061	2.9890	2.9737	2.9600
	10	2.9782	2.9430	2.9130	2.8872	2.8647	2.8450	2.8276	2.8120	2.7980
	11	2.8536	2.8179	2.7876	2.7614	2.7386	2.7186	2.7009	2.6851	2.6709
	12	2.7534	2.7173	2.6866	2.6602	2.6371	2.6169	2.5989	2.5828	2.5684
	13	2.6710	2.6347	2.6037	2.5769	2.5536	2.5331	2.5149	2.4987	2.4841
	14	2.6022	2.5655	2.5342	2.5073	2.4837	2.4630	2.4446	2.4282	2.4134
	15	2.5437	2.5068	2.4753	2.4481	2.4244	2.4034	2.3849	2.3683	2.3533
	16	2.4935	2.4564	2.4247	2.3973	2.3733	2.3522	2.3335	2.3167	2.3016
	17	2.4499	2.4126	2.3807	2.3531	2.3290	2.3077	2.2888	2.2719	2.2567
	18	2.4117	2.3742	2.3421	2.3143	2.2900	2.2686	2.2496	2.2325	2.2172
	19	2.3779	2.3402	2.3080	2.2800	2.2556	2.2341	2.2149	2.1977	2.1823
	20	2.3479	2.3100	2.2776	2.2495	2.2250	2.2033	2.1840	2.1667	2.1511
	21	2.3210	2.2829	2.2504	2.2222	2.1975	2.1757	2.1563	2.1389	2.1232
	22	2.2967	2.2585	2.2258	2.1975	2.1727	2.1508	2.1313	2.1138	2.0980
	23	2.2747	2.2364	2.2036	2.1752	2.1502	2.1282	2.1086	2.0910	2.0751
	24	2.2547	2.2163	2.1834	2.1548	2.1298	2.1077	2.0880	2.0703	2.0543
	25	2.2365	2.1979	2.1649	2.1362	2.1111	2.0889	2.0691	2.0513	2.0353
	26	2.2197	2.1811	2.1479	2.1192	2.0939	2.0716	2.0518	2.0339	2.0178
	27	2.2043	2.1655	2.1323	2.1035	2.0781	2.0558	2.0358	2.0179	2.0017
	28	2.1900	2.1512	2.1179	2.0889	2.0635	2.0411	2.0210	2.0030	1.9868
	29	2.1768	2.1379	2.1045	2.0755	2.0500	2.0275	2.0073	1.9893	1.9730
	30	2.1646	2.1256	2.0921	2.0630	2.0374	2.0148	1.9946	1.9765	1.9601
40	2.0772	2.0376	2.0035	1.9738	1.9476	1.9245	1.9037	1.8851	1.8682	
60	1.9926	1.9522	1.9174	1.8870	1.8602	1.8364	1.8151	1.7959	1.7784	
120	1.9105	1.8693	1.8337	1.8026	1.7750	1.7505	1.7285	1.7085	1.6904	
$\infty$	1.8307	1.7887	1.7522	1.7202	1.6918	1.6664	1.6435	1.6228	1.6039	

## H

**Critical Values of the  $F$ -Distribution ( $\alpha = 0.050$ ) (cont.)**

		Numerator Degrees of Freedom						
		19	20	24	30	40	60	120
Denominator Degrees of Freedom	1	247.6861	248.0131	249.0518	250.0951	251.1432	252.1957	253.2529
	2	19.4431	19.4458	19.4541	19.4624	19.4707	19.4791	19.4874
	3	8.6670	8.6602	8.6385	8.6166	8.5944	8.5720	8.5494
	4	5.8114	5.8025	5.7744	5.7459	5.7170	5.6877	5.6581
	5	4.5678	4.5581	4.5272	4.4957	4.4638	4.4314	4.3985
	6	3.8844	3.8742	3.8415	3.8082	3.7743	3.7398	3.7047
	7	3.4551	3.4445	3.4105	3.3758	3.3404	3.3043	3.2674
	8	3.1613	3.1503	3.1152	3.0794	3.0428	3.0053	2.9669
	9	2.9477	2.9365	2.9005	2.8637	2.8259	2.7872	2.7475
	10	2.7854	2.7740	2.7372	2.6996	2.6609	2.6211	2.5801
	11	2.6581	2.6464	2.6090	2.5705	2.5309	2.4901	2.4480
	12	2.5554	2.5436	2.5055	2.4663	2.4259	2.3842	2.3410
	13	2.4709	2.4589	2.4202	2.3803	2.3392	2.2966	2.2524
	14	2.4000	2.3879	2.3487	2.3082	2.2664	2.2229	2.1778
	15	2.3398	2.3275	2.2878	2.2468	2.2043	2.1601	2.1141
	16	2.2880	2.2756	2.2354	2.1938	2.1507	2.1058	2.0589
	17	2.2429	2.2304	2.1898	2.1477	2.1040	2.0584	2.0107
	18	2.2033	2.1906	2.1497	2.1071	2.0629	2.0166	1.9681
	19	2.1683	2.1555	2.1141	2.0712	2.0264	1.9795	1.9302
	20	2.1370	2.1242	2.0825	2.0391	1.9938	1.9464	1.8963
	21	2.1090	2.0960	2.0540	2.0102	1.9645	1.9165	1.8657
	22	2.0837	2.0707	2.0283	1.9842	1.9380	1.8894	1.8380
	23	2.0608	2.0476	2.0050	1.9605	1.9139	1.8648	1.8128
	24	2.0399	2.0267	1.9838	1.9390	1.8920	1.8424	1.7896
	25	2.0207	2.0075	1.9643	1.9192	1.8718	1.8217	1.7684
	26	2.0032	1.9898	1.9464	1.9010	1.8533	1.8027	1.7488
	27	1.9870	1.9736	1.9299	1.8842	1.8361	1.7851	1.7306
	28	1.9720	1.9586	1.9147	1.8687	1.8203	1.7689	1.7138
	29	1.9581	1.9446	1.9005	1.8543	1.8055	1.7537	1.6981
	30	1.9452	1.9317	1.8874	1.8409	1.7918	1.7396	1.6835
	40	1.8529	1.8389	1.7929	1.7444	1.6928	1.6373	1.5766
	60	1.7625	1.7480	1.7001	1.6491	1.5943	1.5343	1.4673
120	1.6739	1.6587	1.6084	1.5543	1.4952	1.4290	1.3519	
$\infty$	1.5865	1.5705	1.5173	1.4591	1.3940	1.3180	1.2214	

# H Critical Values of the *F*-Distribution ( $\alpha = 0.025$ )

		Numerator Degrees of Freedom								
		1	2	3	4	5	6	7	8	9
Denominator Degrees of Freedom	1	647.7890	799.5000	864.1630	899.5833	921.8479	937.1111	948.2169	956.6562	963.2846
	2	38.5063	39.0000	39.1655	39.2484	39.2982	39.3315	39.3552	39.3730	39.3869
	3	17.4434	16.0441	15.4392	15.1010	14.8848	14.7347	14.6244	14.5399	14.4731
	4	12.2179	10.6491	9.9792	9.6045	9.3645	9.1973	9.0741	8.9796	8.9047
	5	10.0070	8.4336	7.7636	7.3879	7.1464	6.9777	6.8531	6.7572	6.6811
	6	8.8131	7.2599	6.5988	6.2272	5.9876	5.8198	5.6955	5.5996	5.5234
	7	8.0727	6.5415	5.8898	5.5226	5.2852	5.1186	4.9949	4.8993	4.8232
	8	7.5709	6.0595	5.4160	5.0526	4.8173	4.6517	4.5286	4.4333	4.3572
	9	7.2093	5.7147	5.0781	4.7181	4.4844	4.3197	4.1970	4.1020	4.0260
	10	6.9367	5.4564	4.8256	4.4683	4.2361	4.0721	3.9498	3.8549	3.7790
	11	6.7241	5.2559	4.6300	4.2751	4.0440	3.8807	3.7586	3.6638	3.5879
	12	6.5538	5.0959	4.4742	4.1212	3.8911	3.7283	3.6065	3.5118	3.4358
	13	6.4143	4.9653	4.3472	3.9959	3.7667	3.6043	3.4827	3.3880	3.3120
	14	6.2979	4.8567	4.2417	3.8919	3.6634	3.5014	3.3799	3.2853	3.2093
	15	6.1995	4.7650	4.1528	3.8043	3.5764	3.4147	3.2934	3.1987	3.1227
	16	6.1151	4.6867	4.0768	3.7294	3.5021	3.3406	3.2194	3.1248	3.0488
	17	6.0420	4.6189	4.0112	3.6648	3.4379	3.2767	3.1556	3.0610	2.9849
	18	5.9781	4.5597	3.9539	3.6083	3.3820	3.2209	3.0999	3.0053	2.9291
	19	5.9216	4.5075	3.9034	3.5587	3.3327	3.1718	3.0509	2.9563	2.8801
	20	5.8715	4.4613	3.8587	3.5147	3.2891	3.1283	3.0074	2.9128	2.8365
	21	5.8266	4.4199	3.8188	3.4754	3.2501	3.0895	2.9686	2.8740	2.7977
	22	5.7863	4.3828	3.7829	3.4401	3.2151	3.0546	2.9338	2.8392	2.7628
	23	5.7498	4.3492	3.7505	3.4083	3.1835	3.0232	2.9023	2.8077	2.7313
	24	5.7166	4.3187	3.7211	3.3794	3.1548	2.9946	2.8738	2.7791	2.7027
	25	5.6864	4.2909	3.6943	3.3530	3.1287	2.9685	2.8478	2.7531	2.6766
	26	5.6586	4.2655	3.6697	3.3289	3.1048	2.9447	2.8240	2.7293	2.6528
	27	5.6331	4.2421	3.6472	3.3067	3.0828	2.9228	2.8021	2.7074	2.6309
	28	5.6096	4.2205	3.6264	3.2863	3.0626	2.9027	2.7820	2.6872	2.6106
	29	5.5878	4.2006	3.6072	3.2674	3.0438	2.8840	2.7633	2.6686	2.5919
	30	5.5675	4.1821	3.5894	3.2499	3.0265	2.8667	2.7460	2.6513	2.5746
40	5.4239	4.0510	3.4633	3.1261	2.9037	2.7444	2.6238	2.5289	2.4519	
60	5.2856	3.9253	3.3425	3.0077	2.7863	2.6274	2.5068	2.4117	2.3344	
120	5.1523	3.8046	3.2269	2.8943	2.6740	2.5154	2.3948	2.2994	2.2217	
$\infty$	5.0239	3.6889	3.1161	2.7858	2.5665	2.4082	2.2876	2.1918	2.1137	



## H

**Critical Values of the *F*-Distribution ( $\alpha = 0.025$ ) (cont.)**

		Numerator Degrees of Freedom								
		10	11	12	13	14	15	16	17	18
Denominator Degrees of Freedom	1	968.6274	973.0252	976.7079	979.8368	982.5278	984.8668	986.9187	988.7331	990.3490
	2	39.3980	39.4071	39.4146	39.4210	39.4265	39.4313	39.4354	39.4391	39.4424
	3	14.4189	14.3742	14.3366	14.3045	14.2768	14.2527	14.2315	14.2127	14.1960
	4	8.8439	8.7935	8.7512	8.7150	8.6838	8.6565	8.6326	8.6113	8.5924
	5	6.6192	6.5678	6.5245	6.4876	6.4556	6.4277	6.4032	6.3814	6.3619
	6	5.4613	5.4098	5.3662	5.3290	5.2968	5.2687	5.2439	5.2218	5.2021
	7	4.7611	4.7095	4.6658	4.6285	4.5961	4.5678	4.5428	4.5206	4.5008
	8	4.2951	4.2434	4.1997	4.1622	4.1297	4.1012	4.0761	4.0538	4.0338
	9	3.9639	3.9121	3.8682	3.8306	3.7980	3.7694	3.7441	3.7216	3.7015
	10	3.7168	3.6649	3.6209	3.5832	3.5504	3.5217	3.4963	3.4737	3.4534
	11	3.5257	3.4737	3.4296	3.3917	3.3588	3.3299	3.3044	3.2816	3.2612
	12	3.3736	3.3215	3.2773	3.2393	3.2062	3.1772	3.1515	3.1286	3.1081
	13	3.2497	3.1975	3.1532	3.1150	3.0819	3.0527	3.0269	3.0039	2.9832
	14	3.1469	3.0946	3.0502	3.0119	2.9786	2.9493	2.9234	2.9003	2.8795
	15	3.0602	3.0078	2.9633	2.9249	2.8915	2.8621	2.8360	2.8128	2.7919
	16	2.9862	2.9337	2.8890	2.8506	2.8170	2.7875	2.7614	2.7380	2.7170
	17	2.9222	2.8696	2.8249	2.7863	2.7526	2.7230	2.6968	2.6733	2.6522
	18	2.8664	2.8137	2.7689	2.7302	2.6964	2.6667	2.6404	2.6168	2.5956
	19	2.8172	2.7645	2.7196	2.6808	2.6469	2.6171	2.5907	2.5670	2.5457
	20	2.7737	2.7209	2.6758	2.6369	2.6030	2.5731	2.5465	2.5228	2.5014
	21	2.7348	2.6819	2.6368	2.5978	2.5638	2.5338	2.5071	2.4833	2.4618
	22	2.6998	2.6469	2.6017	2.5626	2.5285	2.4984	2.4717	2.4478	2.4262
	23	2.6682	2.6152	2.5699	2.5308	2.4966	2.4665	2.4396	2.4157	2.3940
	24	2.6396	2.5865	2.5411	2.5019	2.4677	2.4374	2.4105	2.3865	2.3648
	25	2.6135	2.5603	2.5149	2.4756	2.4413	2.4110	2.3840	2.3599	2.3381
	26	2.5896	2.5363	2.4908	2.4515	2.4171	2.3867	2.3597	2.3355	2.3137
	27	2.5676	2.5143	2.4688	2.4293	2.3949	2.3644	2.3373	2.3131	2.2912
	28	2.5473	2.4940	2.4484	2.4089	2.3743	2.3438	2.3167	2.2924	2.2704
	29	2.5286	2.4752	2.4295	2.3900	2.3554	2.3248	2.2976	2.2732	2.2512
	30	2.5112	2.4577	2.4120	2.3724	2.3378	2.3072	2.2799	2.2554	2.2334
40	2.3882	2.3343	2.2882	2.2481	2.2130	2.1819	2.1542	2.1293	2.1068	
60	2.2702	2.2159	2.1692	2.1286	2.0929	2.0613	2.0330	2.0076	1.9846	
120	2.1570	2.1021	2.0548	2.0136	1.9773	1.9450	1.9161	1.8900	1.8663	
$\infty$	2.0483	1.9927	1.9447	1.9028	1.8657	1.8326	1.8028	1.7760	1.7515	

## H

**Critical Values of the *F*-Distribution ( $\alpha = 0.025$ ) (cont.)**

		Numerator Degrees of Freedom						
		19	20	24	30	40	60	120
Denominator Degrees of Freedom	<b>1</b>	991.7973	993.1028	997.2492	1001.4144	1005.5981	1009.8001	1014.0202
	<b>2</b>	39.4453	39.4479	39.4562	39.4646	39.4729	39.4812	39.4896
	<b>3</b>	14.1810	14.1674	14.1241	14.0805	14.0365	13.9921	13.9473
	<b>4</b>	8.5753	8.5599	8.5109	8.4613	8.4111	8.3604	8.3092
	<b>5</b>	6.3444	6.3286	6.2780	6.2269	6.1750	6.1225	6.0693
	<b>6</b>	5.1844	5.1684	5.1172	5.0652	5.0125	4.9589	4.9044
	<b>7</b>	4.4829	4.4667	4.4150	4.3624	4.3089	4.2544	4.1989
	<b>8</b>	4.0158	3.9995	3.9472	3.8940	3.8398	3.7844	3.7279
	<b>9</b>	3.6833	3.6669	3.6142	3.5604	3.5055	3.4493	3.3918
	<b>10</b>	3.4351	3.4185	3.3654	3.3110	3.2554	3.1984	3.1399
	<b>11</b>	3.2428	3.2261	3.1725	3.1176	3.0613	3.0035	2.9441
	<b>12</b>	3.0896	3.0728	3.0187	2.9633	2.9063	2.8478	2.7874
	<b>13</b>	2.9646	2.9477	2.8932	2.8372	2.7797	2.7204	2.6590
	<b>14</b>	2.8607	2.8437	2.7888	2.7324	2.6742	2.6142	2.5519
	<b>15</b>	2.7730	2.7559	2.7006	2.6437	2.5850	2.5242	2.4611
	<b>16</b>	2.6980	2.6808	2.6252	2.5678	2.5085	2.4471	2.3831
	<b>17</b>	2.6331	2.6158	2.5598	2.5020	2.4422	2.3801	2.3153
	<b>18</b>	2.5764	2.5590	2.5027	2.4445	2.3842	2.3214	2.2558
	<b>19</b>	2.5265	2.5089	2.4523	2.3937	2.3329	2.2696	2.2032
	<b>20</b>	2.4821	2.4645	2.4076	2.3486	2.2873	2.2234	2.1562
	<b>21</b>	2.4424	2.4247	2.3675	2.3082	2.2465	2.1819	2.1141
	<b>22</b>	2.4067	2.3890	2.3315	2.2718	2.2097	2.1446	2.0760
	<b>23</b>	2.3745	2.3567	2.2989	2.2389	2.1763	2.1107	2.0415
	<b>24</b>	2.3452	2.3273	2.2693	2.2090	2.1460	2.0799	2.0099
	<b>25</b>	2.3184	2.3005	2.2422	2.1816	2.1183	2.0516	1.9811
	<b>26</b>	2.2939	2.2759	2.2174	2.1565	2.0928	2.0257	1.9545
	<b>27</b>	2.2713	2.2533	2.1946	2.1334	2.0693	2.0018	1.9299
	<b>28</b>	2.2505	2.2324	2.1735	2.1121	2.0477	1.9797	1.9072
	<b>29</b>	2.2313	2.2131	2.1540	2.0923	2.0276	1.9591	1.8861
	<b>30</b>	2.2134	2.1952	2.1359	2.0739	2.0089	1.9400	1.8664
	<b>40</b>	2.0864	2.0677	2.0069	1.9429	1.8752	1.8028	1.7242
	<b>60</b>	1.9636	1.9445	1.8817	1.8152	1.7440	1.6668	1.5810
<b>120</b>	1.8447	1.8249	1.7597	1.6899	1.6141	1.5299	1.4327	
$\infty$	1.7291	1.7085	1.6402	1.5660	1.4836	1.3883	1.2685	

## H Critical Values of the *F*-Distribution ( $\alpha = 0.010$ )

		Numerator Degrees of Freedom								
		1	2	3	4	5	6	7	8	9
Denominator Degrees of Freedom	1	4052.1807	4999.5000	5403.3520	5624.5833	5763.6496	5858.9861	5928.3557	5981.0703	6022.4732
	2	98.5025	99.0000	99.1662	99.2494	99.2993	99.3326	99.3564	99.3742	99.3881
	3	34.1162	30.8165	29.4567	28.7099	28.2371	27.9107	27.6717	27.4892	27.3452
	4	21.1977	18.0000	16.6944	15.9770	15.5219	15.2069	14.9758	14.7989	14.6591
	5	16.2582	13.2739	12.0600	11.3919	10.9670	10.6723	10.4555	10.2893	10.1578
	6	13.7450	10.9248	9.7795	9.1483	8.7459	8.4661	8.2600	8.1017	7.9761
	7	12.2464	9.5466	8.4513	7.8466	7.4604	7.1914	6.9928	6.8400	6.7188
	8	11.2586	8.6491	7.5910	7.0061	6.6318	6.3707	6.1776	6.0289	5.9106
	9	10.5614	8.0215	6.9919	6.4221	6.0569	5.8018	5.6129	5.4671	5.3511
	10	10.0443	7.5594	6.5523	5.9943	5.6363	5.3858	5.2001	5.0567	4.9424
	11	9.6460	7.2057	6.2167	5.6683	5.3160	5.0692	4.8861	4.7445	4.6315
	12	9.3302	6.9266	5.9525	5.4120	5.0643	4.8206	4.6395	4.4994	4.3875
	13	9.0738	6.7010	5.7394	5.2053	4.8616	4.6204	4.4410	4.3021	4.1911
	14	8.8616	6.5149	5.5639	5.0354	4.6950	4.4558	4.2779	4.1399	4.0297
	15	8.6831	6.3589	5.4170	4.8932	4.5556	4.3183	4.1415	4.0045	3.8948
	16	8.5310	6.2262	5.2922	4.7726	4.4374	4.2016	4.0259	3.8896	3.7804
	17	8.3997	6.1121	5.1850	4.6690	4.3359	4.1015	3.9267	3.7910	3.6822
	18	8.2854	6.0129	5.0919	4.5790	4.2479	4.0146	3.8406	3.7054	3.5971
	19	8.1849	5.9259	5.0103	4.5003	4.1708	3.9386	3.7653	3.6305	3.5225
	20	8.0960	5.8489	4.9382	4.4307	4.1027	3.8714	3.6987	3.5644	3.4567
	21	8.0166	5.7804	4.8740	4.3688	4.0421	3.8117	3.6396	3.5056	3.3981
	22	7.9454	5.7190	4.8166	4.3134	3.9880	3.7583	3.5867	3.4530	3.3458
	23	7.8811	5.6637	4.7649	4.2636	3.9392	3.7102	3.5390	3.4057	3.2986
	24	7.8229	5.6136	4.7181	4.2184	3.8951	3.6667	3.4959	3.3629	3.2560
	25	7.7698	5.5680	4.6755	4.1774	3.8550	3.6272	3.4568	3.3239	3.2172
	26	7.7213	5.5263	4.6366	4.1400	3.8183	3.5911	3.4210	3.2884	3.1818
	27	7.6767	5.4881	4.6009	4.1056	3.7848	3.5580	3.3882	3.2558	3.1494
	28	7.6356	5.4529	4.5681	4.0740	3.7539	3.5276	3.3581	3.2259	3.1195
	29	7.5977	5.4204	4.5378	4.0449	3.7254	3.4995	3.3303	3.1982	3.0920
	30	7.5625	5.3903	4.5097	4.0179	3.6990	3.4735	3.3045	3.1726	3.0665
40	7.3141	5.1785	4.3126	3.8283	3.5138	3.2910	3.1238	2.9930	2.8876	
60	7.0771	4.9774	4.1259	3.6490	3.3389	3.1187	2.9530	2.8233	2.7185	
120	6.8509	4.7865	3.9491	3.4795	3.1735	2.9559	2.7918	2.6629	2.5586	
$\infty$	6.6349	4.6052	3.7816	3.3192	3.0173	2.8020	2.6393	2.5113	2.4074	

# H Critical Values of the *F*-Distribution ( $\alpha = 0.010$ ) (cont.)

		Numerator Degrees of Freedom								
		10	11	12	13	14	15	16	17	18
Denominator Degrees of Freedom	1	6055.8467	6083.3168	6106.3207	6125.8647	6142.6740	6157.2846	6170.1012	6181.4348	6191.5287
	2	99.3992	99.4083	99.4159	99.4223	99.4278	99.4325	99.4367	99.4404	99.4436
	3	27.2287	27.1326	27.0518	26.9831	26.9238	26.8722	26.8269	26.7867	26.7509
	4	14.5459	14.4523	14.3736	14.3065	14.2486	14.1982	14.1539	14.1146	14.0795
	5	10.0510	9.9626	9.8883	9.8248	9.7700	9.7222	9.6802	9.6429	9.6096
	6	7.8741	7.7896	7.7183	7.6575	7.6049	7.5590	7.5186	7.4827	7.4507
	7	6.6201	6.5382	6.4691	6.4100	6.3590	6.3143	6.2750	6.2401	6.2089
	8	5.8143	5.7343	5.6667	5.6089	5.5589	5.5151	5.4766	5.4423	5.4116
	9	5.2565	5.1779	5.1114	5.0545	5.0052	4.9621	4.9240	4.8902	4.8599
	10	4.8491	4.7715	4.7059	4.6496	4.6008	4.5581	4.5204	4.4869	4.4569
	11	4.5393	4.4624	4.3974	4.3416	4.2932	4.2509	4.2134	4.1801	4.1503
	12	4.2961	4.2198	4.1553	4.0999	4.0518	4.0096	3.9724	3.9392	3.9095
	13	4.1003	4.0245	3.9603	3.9052	3.8573	3.8154	3.7783	3.7452	3.7156
	14	3.9394	3.8640	3.8001	3.7452	3.6975	3.6557	3.6187	3.5857	3.5561
	15	3.8049	3.7299	3.6662	3.6115	3.5639	3.5222	3.4852	3.4523	3.4228
	16	3.6909	3.6162	3.5527	3.4981	3.4506	3.4089	3.3720	3.3391	3.3096
	17	3.5931	3.5185	3.4552	3.4007	3.3533	3.3117	3.2748	3.2419	3.2124
	18	3.5082	3.4338	3.3706	3.3162	3.2689	3.2273	3.1904	3.1575	3.1280
	19	3.4338	3.3596	3.2965	3.2422	3.1949	3.1533	3.1165	3.0836	3.0541
	20	3.3682	3.2941	3.2311	3.1769	3.1296	3.0880	3.0512	3.0183	2.9887
	21	3.3098	3.2359	3.1730	3.1187	3.0715	3.0300	2.9931	2.9602	2.9306
	22	3.2576	3.1837	3.1209	3.0667	3.0195	2.9779	2.9411	2.9082	2.8786
	23	3.2106	3.1368	3.0740	3.0199	2.9727	2.9311	2.8943	2.8613	2.8317
	24	3.1681	3.0944	3.0316	2.9775	2.9303	2.8887	2.8519	2.8189	2.7892
	25	3.1294	3.0558	2.9931	2.9389	2.8917	2.8502	2.8133	2.7803	2.7506
	26	3.0941	3.0205	2.9578	2.9038	2.8566	2.8150	2.7781	2.7451	2.7153
	27	3.0618	2.9882	2.9256	2.8715	2.8243	2.7827	2.7458	2.7127	2.6830
	28	3.0320	2.9585	2.8959	2.8418	2.7946	2.7530	2.7160	2.6830	2.6532
	29	3.0045	2.9311	2.8685	2.8144	2.7672	2.7256	2.6886	2.6555	2.6257
	30	2.9791	2.9057	2.8431	2.7890	2.7418	2.7002	2.6632	2.6301	2.6003
40	2.8005	2.7274	2.6648	2.6107	2.5634	2.5216	2.4844	2.4511	2.4210	
60	2.6318	2.5587	2.4961	2.4419	2.3943	2.3523	2.3148	2.2811	2.2507	
120	2.4721	2.3990	2.3363	2.2818	2.2339	2.1915	2.1536	2.1194	2.0885	
$\infty$	2.3209	2.2477	2.1848	2.1299	2.0815	2.0385	2.0000	1.9652	1.9336	

## H

**Critical Values of the *F*-Distribution ( $\alpha = 0.010$ ) (cont.)**

		Numerator Degrees of Freedom						
		19	20	24	30	40	60	120
Denominator Degrees of Freedom	1	6200.5756	6208.7302	6234.6309	6260.6486	6286.7821	6313.0301	6339.3913
	2	99.4465	99.4492	99.4575	99.4658	99.4742	99.4825	99.4908
	3	26.7188	26.6898	26.5975	26.5045	26.4108	26.3164	26.2211
	4	14.0480	14.0196	13.9291	13.8377	13.7454	13.6522	13.5581
	5	9.5797	9.5526	9.4665	9.3793	9.2912	9.2020	9.1118
	6	7.4219	7.3958	7.3127	7.2285	7.1432	7.0567	6.9690
	7	6.1808	6.1554	6.0743	5.9920	5.9084	5.8236	5.7373
	8	5.3840	5.3591	5.2793	5.1981	5.1156	5.0316	4.9461
	9	4.8327	4.8080	4.7290	4.6486	4.5666	4.4831	4.3978
	10	4.4299	4.4054	4.3269	4.2469	4.1653	4.0819	3.9965
	11	4.1234	4.0990	4.0209	3.9411	3.8596	3.7761	3.6904
	12	3.8827	3.8584	3.7805	3.7008	3.6192	3.5355	3.4494
	13	3.6888	3.6646	3.5868	3.5070	3.4253	3.3413	3.2548
	14	3.5294	3.5052	3.4274	3.3476	3.2656	3.1813	3.0942
	15	3.3961	3.3719	3.2940	3.2141	3.1319	3.0471	2.9595
	16	3.2829	3.2587	3.1808	3.1007	3.0182	2.9330	2.8447
	17	3.1857	3.1615	3.0835	3.0032	2.9205	2.8348	2.7459
	18	3.1013	3.0771	2.9990	2.9185	2.8354	2.7493	2.6597
	19	3.0274	3.0031	2.9249	2.8442	2.7608	2.6742	2.5839
	20	2.9620	2.9377	2.8594	2.7785	2.6947	2.6077	2.5168
	21	2.9039	2.8796	2.8010	2.7200	2.6359	2.5484	2.4568
	22	2.8518	2.8274	2.7488	2.6675	2.5831	2.4951	2.4029
	23	2.8049	2.7805	2.7017	2.6202	2.5355	2.4471	2.3542
	24	2.7624	2.7380	2.6591	2.5773	2.4923	2.4035	2.3100
	25	2.7238	2.6993	2.6203	2.5383	2.4530	2.3637	2.2696
	26	2.6885	2.6640	2.5848	2.5026	2.4170	2.3273	2.2325
	27	2.6561	2.6316	2.5522	2.4699	2.3840	2.2938	2.1985
	28	2.6263	2.6017	2.5223	2.4397	2.3535	2.2629	2.1670
	29	2.5987	2.5742	2.4946	2.4118	2.3253	2.2344	2.1379
	30	2.5732	2.5487	2.4689	2.3860	2.2992	2.2079	2.1108
	40	2.3937	2.3689	2.2880	2.2034	2.1142	2.0194	1.9172
	60	2.2230	2.1978	2.1154	2.0285	1.9360	1.8363	1.7263
120	2.0604	2.0346	1.9500	1.8600	1.7628	1.6557	1.5330	
$\infty$	1.9048	1.8783	1.7908	1.6964	1.5923	1.4730	1.3246	

# H Critical Values of the *F*-Distribution ( $\alpha = 0.005$ )

		Numerator Degrees of Freedom								
		1	2	3	4	5	6	7	8	9
Denominator Degrees of Freedom	1	16210.7227	19999.5000	21614.7414	22499.5833	23055.7982	23437.1111	23714.5658	23925.4062	24091.0041
	2	198.5013	199.0000	199.1664	199.2497	199.2996	199.3330	199.3568	199.3746	199.3885
	3	55.5520	49.7993	47.4672	46.1946	45.3916	44.8385	44.4341	44.1256	43.8824
	4	31.3328	26.2843	24.2591	23.1545	22.4564	21.9746	21.6217	21.3520	21.1391
	5	22.7848	18.3138	16.5298	15.5561	14.9396	14.5133	14.2004	13.9610	13.7716
	6	18.6350	14.5441	12.9166	12.0275	11.4637	11.0730	10.7859	10.5658	10.3915
	7	16.2356	12.4040	10.8824	10.0505	9.5221	9.1553	8.8854	8.6781	8.5138
	8	14.6882	11.0424	9.5965	8.8051	8.3018	7.9520	7.6941	7.4959	7.3386
	9	13.6136	10.1067	8.7171	7.9559	7.4712	7.1339	6.8849	6.6933	6.5411
	10	12.8265	9.4270	8.0807	7.3428	6.8724	6.5446	6.3025	6.1159	5.9676
	11	12.2263	8.9122	7.6004	6.8809	6.4217	6.1016	5.8648	5.6821	5.5368
	12	11.7542	8.5096	7.2258	6.5211	6.0711	5.7570	5.5245	5.3451	5.2021
	13	11.3735	8.1865	6.9258	6.2335	5.7910	5.4819	5.2529	5.0761	4.9351
	14	11.0603	7.9216	6.6804	5.9984	5.5623	5.2574	5.0313	4.8566	4.7173
	15	10.7980	7.7008	6.4760	5.8029	5.3721	5.0708	4.8473	4.6744	4.5364
	16	10.5755	7.5138	6.3034	5.6378	5.2117	4.9134	4.6920	4.5207	4.3838
	17	10.3842	7.3536	6.1556	5.4967	5.0746	4.7789	4.5594	4.3894	4.2535
	18	10.2181	7.2148	6.0278	5.3746	4.9560	4.6627	4.4448	4.2759	4.1410
	19	10.0725	7.0935	5.9161	5.2681	4.8526	4.5614	4.3448	4.1770	4.0428
	20	9.9439	6.9865	5.8177	5.1743	4.7616	4.4721	4.2569	4.0900	3.9564
	21	9.8295	6.8914	5.7304	5.0911	4.6809	4.3931	4.1789	4.0128	3.8799
	22	9.7271	6.8064	5.6524	5.0168	4.6088	4.3225	4.1094	3.9440	3.8116
	23	9.6348	6.7300	5.5823	4.9500	4.5441	4.2591	4.0469	3.8822	3.7502
	24	9.5513	6.6609	5.5190	4.8898	4.4857	4.2019	3.9905	3.8264	3.6949
	25	9.4753	6.5982	5.4615	4.8351	4.4327	4.1500	3.9394	3.7758	3.6447
	26	9.4059	6.5409	5.4091	4.7852	4.3844	4.1027	3.8928	3.7297	3.5989
	27	9.3423	6.4885	5.3611	4.7396	4.3402	4.0594	3.8501	3.6875	3.5571
	28	9.2838	6.4403	5.3170	4.6977	4.2996	4.0197	3.8110	3.6487	3.5186
	29	9.2297	6.3958	5.2764	4.6591	4.2622	3.9831	3.7749	3.6131	3.4832
	30	9.1797	6.3547	5.2388	4.6234	4.2276	3.9492	3.7416	3.5801	3.4505
40	8.8279	6.0664	4.9758	4.3738	3.9860	3.7129	3.5088	3.3498	3.2220	
60	8.4946	5.7950	4.7290	4.1399	3.7599	3.4918	3.2911	3.1344	3.0083	
120	8.1788	5.5393	4.4972	3.9207	3.5482	3.2849	3.0874	2.9330	2.8083	
$\infty$	7.8795	5.2983	4.2794	3.7151	3.3499	3.0913	2.8968	2.7444	2.6211	

## H

**Critical Values of the  $F$ -Distribution ( $\alpha = 0.005$ ) (cont.)**

		Numerator Degrees of Freedom								
		10	11	12	13	14	15	16	17	18
Denominator Degrees of Freedom	1	24224.4868	24334.3581	24426.3662	24504.5356	24571.7673	24630.2051	24681.4673	24726.7982	24767.1704
	2	199.3996	199.4087	199.4163	199.4227	199.4282	199.4329	199.4371	199.4408	199.4440
	3	43.6858	43.5236	43.3874	43.2715	43.1716	43.0847	43.0083	42.9407	42.8804
	4	20.9667	20.8243	20.7047	20.6027	20.5148	20.4383	20.3710	20.3113	20.2581
	5	13.6182	13.4912	13.3845	13.2934	13.2148	13.1463	13.0861	13.0327	12.9850
	6	10.2500	10.1329	10.0343	9.9501	9.8774	9.8140	9.7582	9.7086	9.6644
	7	8.3803	8.2697	8.1764	8.0967	8.0279	7.9678	7.9148	7.8678	7.8258
	8	7.2106	7.1045	7.0149	6.9384	6.8721	6.8143	6.7633	6.7180	6.6775
	9	6.4172	6.3142	6.2274	6.1530	6.0887	6.0325	5.9829	5.9388	5.8994
	10	5.8467	5.7462	5.6613	5.5887	5.5257	5.4707	5.4221	5.3789	5.3403
	11	5.4183	5.3197	5.2363	5.1649	5.1031	5.0489	5.0011	4.9586	4.9205
	12	5.0855	4.9884	4.9062	4.8358	4.7748	4.7213	4.6741	4.6321	4.5945
	13	4.8199	4.7240	4.6429	4.5733	4.5129	4.4600	4.4132	4.3716	4.3344
	14	4.6034	4.5085	4.4281	4.3591	4.2993	4.2468	4.2005	4.1592	4.1221
	15	4.4235	4.3295	4.2497	4.1813	4.1219	4.0698	4.0237	3.9827	3.9459
	16	4.2719	4.1785	4.0994	4.0314	3.9723	3.9205	3.8747	3.8338	3.7972
	17	4.1424	4.0496	3.9709	3.9033	3.8445	3.7929	3.7473	3.7066	3.6701
	18	4.0305	3.9382	3.8599	3.7926	3.7341	3.6827	3.6373	3.5967	3.5603
	19	3.9329	3.8410	3.7631	3.6961	3.6378	3.5866	3.5412	3.5008	3.4645
	20	3.8470	3.7555	3.6779	3.6111	3.5530	3.5020	3.4568	3.4164	3.3802
	21	3.7709	3.6798	3.6024	3.5358	3.4779	3.4270	3.3818	3.3416	3.3054
	22	3.7030	3.6122	3.5350	3.4686	3.4108	3.3600	3.3150	3.2748	3.2387
	23	3.6420	3.5515	3.4745	3.4083	3.3506	3.2999	3.2549	3.2148	3.1787
	24	3.5870	3.4967	3.4199	3.3538	3.2962	3.2456	3.2007	3.1606	3.1246
	25	3.5370	3.4470	3.3704	3.3044	3.2469	3.1963	3.1515	3.1114	3.0754
	26	3.4916	3.4017	3.3252	3.2594	3.2020	3.1515	3.1067	3.0666	3.0306
	27	3.4499	3.3602	3.2839	3.2182	3.1608	3.1104	3.0656	3.0256	2.9896
	28	3.4117	3.3222	3.2460	3.1803	3.1231	3.0727	3.0279	2.9879	2.9520
	29	3.3765	3.2871	3.2110	3.1454	3.0882	3.0379	2.9932	2.9532	2.9173
	30	3.3440	3.2547	3.1787	3.1132	3.0560	3.0057	2.9611	2.9211	2.8852
40	3.1167	3.0284	2.9531	2.8880	2.8312	2.7811	2.7365	2.6966	2.6607	
60	2.9042	2.8166	2.7419	2.6771	2.6205	2.5705	2.5259	2.4859	2.4498	
120	2.7052	2.6183	2.5439	2.4794	2.4228	2.3727	2.3280	2.2878	2.2514	
$\infty$	2.5188	2.4325	2.3583	2.2938	2.2371	2.1868	2.1417	2.1011	2.0643	

## H

**Critical Values of the *F*-Distribution ( $\alpha = 0.005$ ) (cont.)**

		Numerator Degrees of Freedom						
		19	20	24	30	40	60	120
Denominator Degrees of Freedom	<b>1</b>	24803.3549	24835.9709	24939.5653	25043.6277	25148.1532	25253.1369	25358.5735
	<b>2</b>	199.4470	199.4496	199.4579	199.4663	199.4746	199.4829	199.4912
	<b>3</b>	42.8263	42.7775	42.6222	42.4658	42.3082	42.1494	41.9895
	<b>4</b>	20.2104	20.1673	20.0300	19.8915	19.7518	19.6107	19.4684
	<b>5</b>	12.9422	12.9035	12.7802	12.6556	12.5297	12.4024	12.2737
	<b>6</b>	9.6247	9.5888	9.4742	9.3582	9.2408	9.1219	9.0015
	<b>7</b>	7.7881	7.7540	7.6450	7.5345	7.4224	7.3088	7.1933
	<b>8</b>	6.6411	6.6082	6.5029	6.3961	6.2875	6.1772	6.0649
	<b>9</b>	5.8639	5.8318	5.7292	5.6248	5.5186	5.4104	5.3001
	<b>10</b>	5.3055	5.2740	5.1732	5.0706	4.9659	4.8592	4.7501
	<b>11</b>	4.8863	4.8552	4.7557	4.6543	4.5508	4.4450	4.3367
	<b>12</b>	4.5606	4.5299	4.4314	4.3309	4.2282	4.1229	4.0149
	<b>13</b>	4.3008	4.2703	4.1726	4.0727	3.9704	3.8655	3.7577
	<b>14</b>	4.0888	4.0585	3.9614	3.8619	3.7600	3.6552	3.5473
	<b>15</b>	3.9127	3.8826	3.7859	3.6867	3.5850	3.4803	3.3722
	<b>16</b>	3.7641	3.7342	3.6378	3.5389	3.4372	3.3324	3.2240
	<b>17</b>	3.6372	3.6073	3.5112	3.4124	3.3108	3.2058	3.0971
	<b>18</b>	3.5275	3.4977	3.4017	3.3030	3.2014	3.0962	2.9871
	<b>19</b>	3.4318	3.4020	3.3062	3.2075	3.1058	3.0004	2.8908
	<b>20</b>	3.3475	3.3178	3.2220	3.1234	3.0215	2.9159	2.8058
	<b>21</b>	3.2728	3.2431	3.1474	3.0488	2.9467	2.8408	2.7302
	<b>22</b>	3.2060	3.1764	3.0807	2.9821	2.8799	2.7736	2.6625
	<b>23</b>	3.1461	3.1165	3.0208	2.9221	2.8197	2.7132	2.6015
	<b>24</b>	3.0920	3.0624	2.9667	2.8679	2.7654	2.6585	2.5463
	<b>25</b>	3.0429	3.0133	2.9176	2.8187	2.7160	2.6088	2.4961
	<b>26</b>	2.9981	2.9685	2.8728	2.7738	2.6709	2.5633	2.4501
	<b>27</b>	2.9571	2.9275	2.8318	2.7327	2.6296	2.5217	2.4079
	<b>28</b>	2.9194	2.8899	2.7941	2.6949	2.5916	2.4834	2.3690
	<b>29</b>	2.8847	2.8551	2.7594	2.6600	2.5565	2.4479	2.3331
	<b>30</b>	2.8526	2.8230	2.7272	2.6278	2.5241	2.4151	2.2998
	<b>40</b>	2.6281	2.5984	2.5020	2.4015	2.2958	2.1838	2.0636
	<b>60</b>	2.4171	2.3872	2.2898	2.1874	2.0789	1.9622	1.8341
<b>120</b>	2.2183	2.1881	2.0890	1.9840	1.8709	1.7469	1.6055	
$\infty$	2.0307	1.9999	1.8983	1.7891	1.6692	1.5326	1.3638	



# Critical Values for the Sign Test

**Note:** \* denotes that it is not possible to have values in the critical region.

$\alpha$ for a one-tailed test	0.005	0.01	0.025	0.05
$\alpha$ for a two-tailed test	0.01	0.02	0.05	0.10
$n$				
5	*	*	*	0
6	*	*	0	0
7	*	0	0	0
8	0	0	0	1
9	0	0	1	1
10	0	0	1	1
11	0	1	1	2
12	1	1	2	2
13	1	1	2	3
14	1	2	2	3
15	2	2	3	3
16	2	2	3	4
17	2	3	4	4
18	3	3	4	5
19	3	4	4	5
20	3	4	5	5
21	4	4	5	6
22	4	5	5	6
23	4	5	6	7
24	5	5	6	7
25	5	6	7	7

$$\text{For } n > 25, z = \frac{X + 0.5 - \frac{n}{2}}{\frac{\sqrt{n}}{2}}.$$

## J Critical Values for the Wilcoxon Signed-Rank Test

Note: \* denotes that it is not possible to have values in the critical region.

$\alpha$ for a one-tailed test	0.005	0.01	0.025	0.05
$\alpha$ for a two-tailed test	0.01	0.02	0.05	0.10
<i>n</i>				
5	*	*	*	1
6	*	*	1	2
7	*	0	2	4
8	0	2	4	6
9	2	3	6	8
10	3	5	8	11
11	5	7	11	14
12	7	10	14	17
13	10	13	17	21
14	13	16	21	26
15	16	20	25	30
16	19	24	30	36
17	23	28	35	41
18	28	33	40	47
19	32	38	46	54
20	37	43	52	60
21	43	49	59	68
22	49	56	66	75
23	55	62	73	83
24	61	69	81	92
25	68	77	90	101
26	76	85	98	110
27	84	93	107	120
28	92	102	117	130
29	100	111	127	141
30	109	120	137	152

# K Critical Values for the Wilcoxon Rank-Sum Test

For one-tailed tests with  $\alpha = 0.025$  or two-tailed tests with  $\alpha = 0.05$

$n_1$	3		4		5		6		7		8		9		10	
$n_2$	$T_L$	$T_U$	$T_L$	$T_U$	$T_L$	$T_U$	$T_L$	$T_U$	$T_L$	$T_U$	$T_L$	$T_U$	$T_L$	$T_U$	$T_L$	$T_U$
3	5	16	6	18	6	21	7	23	7	26	8	28	8	31	9	33
4	6	18	11	25	12	28	12	32	13	35	14	38	15	41	16	44
5	6	21	12	28	18	37	19	41	20	45	21	49	22	53	24	56
6	7	23	12	32	19	41	26	52	28	56	29	61	31	65	32	70
7	7	26	13	35	20	45	28	56	37	68	39	73	41	78	43	83
8	8	28	14	38	21	49	29	61	39	73	49	87	51	93	54	98
9	8	31	15	41	22	53	31	65	41	78	51	93	63	108	66	114
10	9	33	16	44	24	56	32	70	43	83	54	98	66	114	79	131

For one-tailed tests with  $\alpha = 0.05$  or two-tailed tests with  $\alpha = 0.10$

$n_1$	3		4		5		6		7		8		9		10	
$n_2$	$T_L$	$T_U$	$T_L$	$T_U$	$T_L$	$T_U$	$T_L$	$T_U$	$T_L$	$T_U$	$T_L$	$T_U$	$T_L$	$T_U$	$T_L$	$T_U$
3	6	15	7	17	7	20	8	22	9	24	9	27	10	29	11	31
4	7	17	12	24	13	27	14	30	15	33	16	36	17	39	18	42
5	7	20	13	27	19	36	20	40	22	43	24	46	25	50	26	54
6	8	22	14	30	20	40	28	50	30	54	32	58	33	63	35	67
7	9	24	15	33	22	43	30	54	39	66	41	71	43	76	46	80
8	9	27	16	36	24	46	32	58	41	71	52	84	54	90	57	95
9	10	29	17	39	25	50	33	63	43	76	54	90	66	105	69	111
10	11	31	18	42	26	54	35	67	46	80	57	95	69	111	83	127

## L Critical Values of Spearman's Rank Correlation Coefficient, $r_s$

Note: \* denotes that it is not possible to have values in the critical region.

$n$	$\alpha = 0.10$	$\alpha = 0.05$	$\alpha = 0.02$	$\alpha = 0.01$
5	0.900	*	*	*
6	0.829	0.886	0.943	*
7	0.714	0.786	0.893	*
8	0.643	0.738	0.833	0.881
9	0.600	0.683	0.783	0.833
10	0.564	0.648	0.745	0.794
11	0.523	0.623	0.736	0.818
12	0.497	0.591	0.703	0.780
13	0.475	0.566	0.673	0.745
14	0.457	0.545	0.646	0.716
15	0.441	0.525	0.623	0.689
16	0.425	0.507	0.601	0.666
17	0.412	0.490	0.582	0.645
18	0.399	0.476	0.564	0.625
19	0.388	0.462	0.549	0.608
20	0.377	0.450	0.534	0.591
21	0.368	0.438	0.521	0.576
22	0.359	0.428	0.508	0.562
23	0.351	0.418	0.496	0.549
24	0.343	0.409	0.485	0.537
25	0.336	0.400	0.475	0.526
26	0.329	0.392	0.465	0.515
27	0.323	0.385	0.456	0.505
28	0.317	0.377	0.448	0.496
29	0.311	0.370	0.440	0.487
30	0.305	0.364	0.432	0.478

# M Critical Values for the Number of Runs ( $\alpha = 0.05$ )

		Value of $n$																		
		2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Value of $m$	2	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2
		6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	3	1	1	1	1	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3
		6	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	4	1	1	1	2	2	2	3	3	3	3	3	3	3	3	4	4	4	4	4
		6	8	9	9	9	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	5	1	1	2	2	3	3	3	3	3	4	4	4	4	4	4	4	4	5	5
		6	8	9	10	10	11	11	12	12	12	12	12	12	12	12	12	12	12	12
	6	1	2	2	3	3	3	3	4	4	4	4	5	5	5	5	5	5	5	6
		6	8	9	10	11	12	12	13	13	13	13	14	14	14	14	14	14	14	14
	7	1	2	2	3	3	3	4	4	5	5	5	5	5	6	6	6	6	6	6
		6	8	10	11	12	13	13	14	14	14	14	15	15	15	16	16	16	16	16
	8	1	2	3	3	3	4	4	5	5	5	6	6	6	6	6	7	7	7	7
		6	8	10	11	12	13	14	14	15	15	16	16	16	16	17	17	17	17	17
	9	1	2	3	3	4	4	5	5	5	6	6	6	7	7	7	7	8	8	8
		6	8	10	12	13	14	14	15	16	16	16	17	17	18	18	18	18	18	18
	10	1	2	3	3	4	5	5	5	6	6	7	7	7	7	8	8	8	8	9
		6	8	10	12	13	14	15	16	16	17	17	18	18	18	19	19	19	19	20
	11	1	2	3	4	4	5	5	6	6	7	7	7	8	8	8	9	9	9	9
		6	8	10	12	13	14	15	16	17	17	18	19	19	19	20	20	20	21	21
12	2	2	3	4	4	5	6	6	7	7	7	8	8	8	9	9	9	10	10	
	6	8	10	12	13	14	16	16	17	18	19	19	20	20	21	21	21	22	22	
13	2	2	3	4	5	5	6	6	7	7	8	8	9	9	9	10	10	10	10	
	6	8	10	12	14	15	16	17	18	19	19	20	20	21	21	22	22	23	23	
14	2	2	3	4	5	5	6	7	7	8	8	9	9	9	10	10	10	11	11	
	6	8	10	12	14	15	16	17	18	19	20	20	21	22	22	23	23	23	24	
15	2	3	3	4	5	6	6	7	7	8	8	9	9	10	10	11	11	11	12	
	6	8	10	12	14	15	16	18	18	19	20	21	22	22	23	23	24	24	25	
16	2	3	4	4	5	6	6	7	8	8	9	9	10	10	11	11	11	12	12	
	6	8	10	12	14	16	17	18	19	20	21	21	22	23	23	24	25	25	25	
17	2	3	4	4	5	6	7	7	8	9	9	10	10	11	11	11	12	12	13	
	6	8	10	12	14	16	17	18	19	20	21	22	23	23	24	25	25	26	26	
18	2	3	4	5	5	6	7	8	8	9	9	10	10	11	11	12	12	13	13	
	6	8	10	12	14	16	17	18	19	20	21	22	23	24	25	25	26	26	27	
19	2	3	4	5	6	6	7	8	8	9	10	10	11	11	12	12	13	13	13	
	6	8	10	12	14	16	17	18	20	21	22	23	23	24	25	26	26	27	27	
20	2	3	4	5	6	6	7	8	9	9	10	10	11	12	12	13	13	13	14	
	6	8	10	12	14	16	17	18	20	21	22	23	24	25	25	26	27	27	28	

## N Critical Values of the $q$ -Distribution ( $\alpha = 0.05$ )

This table contains the critical values of the studentized range distribution where  $k$  is the number of treatments and  $df$  is the error degrees of freedom from the analysis of variance (total number of observations  $- k$ ).

$df$	$k$																		
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	17.97	26.98	32.82	37.08	40.41	43.12	45.40	47.36	49.07	50.59	51.96	53.20	54.33	55.36	56.32	57.22	58.04	58.83	59.56
2	6.085	8.331	9.798	10.88	11.74	12.44	13.03	13.54	13.99	14.39	14.75	15.08	15.38	15.65	15.91	16.14	16.37	16.57	16.77
3	4.501	5.910	6.825	7.502	8.037	8.478	8.853	9.177	9.462	9.717	9.946	10.15	10.35	10.53	10.69	10.84	10.98	11.11	11.24
4	3.927	5.040	5.757	6.287	6.707	7.053	7.347	7.602	7.826	8.027	8.208	8.373	8.525	8.664	8.794	8.914	9.028	9.134	9.233
5	3.635	4.602	5.218	5.673	6.033	6.330	6.582	6.802	6.995	7.168	7.324	7.466	7.596	7.717	7.828	7.932	8.030	8.122	8.208
6	3.461	4.339	4.896	5.305	5.628	5.895	6.122	6.319	6.493	6.649	6.789	6.917	7.034	7.143	7.244	7.338	7.426	7.508	7.587
7	3.344	4.165	4.681	5.060	5.359	5.606	5.815	5.998	6.158	6.302	6.431	6.550	6.658	6.759	6.852	6.939	7.020	7.097	7.170
8	3.261	4.041	4.529	4.886	5.167	5.399	5.597	5.767	5.918	6.054	6.175	6.287	6.389	6.483	6.571	6.653	6.729	6.802	6.870
9	3.199	3.949	4.415	4.756	5.024	5.244	5.432	5.595	5.739	5.867	5.983	6.089	6.186	6.276	6.359	6.437	6.510	6.579	6.644
10	3.151	3.877	4.327	4.654	4.912	5.124	5.305	5.461	5.599	5.722	5.833	5.935	6.028	6.114	6.194	6.269	6.339	6.405	6.467
11	3.113	3.820	4.256	4.574	4.823	5.028	5.202	5.353	5.487	5.605	5.713	5.811	5.901	5.984	6.062	6.134	6.202	6.265	6.326
12	3.082	3.773	4.199	4.508	4.751	4.950	5.119	5.265	5.395	5.511	5.615	5.710	5.798	5.878	5.953	6.023	6.089	6.151	6.209
13	3.055	3.735	4.151	4.453	4.690	4.885	5.049	5.192	5.318	5.431	5.533	5.625	5.711	5.789	5.862	5.931	5.995	6.055	6.112
14	3.033	3.702	4.111	4.407	4.639	4.829	4.990	5.131	5.254	5.364	5.463	5.554	5.637	5.714	5.786	5.852	5.915	5.974	6.029
15	3.014	3.674	4.076	4.367	4.595	4.782	4.940	5.077	5.198	5.306	5.404	5.493	5.574	5.649	5.720	5.785	5.846	5.904	5.958
16	2.998	3.649	4.046	4.333	4.557	4.741	4.897	5.031	5.150	5.256	5.352	5.439	5.520	5.593	5.662	5.727	5.786	5.843	5.897
17	2.984	3.628	4.020	4.303	4.524	4.705	4.858	4.991	5.108	5.212	5.307	5.392	5.471	5.544	5.612	5.675	5.734	5.790	5.842
18	2.971	3.609	3.997	4.277	4.495	4.673	4.824	4.956	5.071	5.174	5.267	5.352	5.429	5.501	5.568	5.630	5.688	5.743	5.794
19	2.960	3.593	3.977	4.253	4.469	4.645	4.794	4.924	5.038	5.140	5.231	5.315	5.391	5.462	5.528	5.589	5.647	5.701	5.752
20	2.950	3.578	3.958	4.232	4.445	4.620	4.768	4.896	5.008	5.108	5.199	5.282	5.357	5.427	5.493	5.553	5.610	5.663	5.714
24	2.919	3.532	3.901	4.166	4.373	4.541	4.684	4.807	4.915	5.012	5.099	5.179	5.251	5.319	5.381	5.439	5.494	5.545	5.594
30	2.888	3.486	3.845	4.102	4.302	4.464	4.602	4.720	4.824	4.917	5.001	5.077	5.147	5.211	5.271	5.327	5.379	5.429	5.475
40	2.858	3.442	3.791	4.039	4.232	4.389	4.521	4.635	4.735	4.824	4.904	4.977	5.044	5.106	5.163	5.216	5.266	5.313	5.358
60	2.829	3.399	3.737	3.977	4.163	4.314	4.441	4.550	4.646	4.732	4.808	4.878	4.942	5.001	5.056	5.107	5.154	5.199	5.241
120	2.800	3.356	3.685	3.917	4.096	4.241	4.363	4.468	4.560	4.641	4.714	4.781	4.842	4.898	4.950	4.998	5.044	5.086	5.126
$\infty$	2.772	3.314	3.633	3.858	4.030	4.170	4.286	4.387	4.474	4.552	4.622	4.685	4.743	4.796	4.845	4.891	4.934	4.974	5.012

## N

**Critical Values of the  $q$ -Distribution ( $\alpha = 0.01$ ) (cont.)**

<i>df</i>	<i>k</i>																		
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	90.03	135.0	164.3	185.6	202.2	215.8	227.2	237.0	245.6	253.2	260.0	266.2	271.8	277.0	281.8	286.3	290.4	294.3	298.0
2	14.04	19.02	22.29	24.72	26.63	28.20	29.53	30.68	31.69	32.59	33.40	34.13	34.81	35.43	36.00	36.53	37.03	37.50	37.95
3	8.261	10.62	12.17	13.33	14.24	15.00	15.64	16.20	16.69	17.13	17.53	17.89	18.22	18.52	18.81	19.07	19.32	19.55	19.77
4	6.512	8.120	9.173	9.958	10.58	11.10	11.55	11.93	12.27	12.57	12.84	13.09	13.32	13.53	13.73	13.91	14.08	14.24	14.40
5	5.702	6.976	7.804	8.421	8.913	9.321	9.669	9.972	10.24	10.48	10.70	10.89	11.08	11.24	11.40	11.55	11.68	11.81	11.93
6	5.243	6.331	7.033	7.556	7.973	8.318	8.613	8.869	9.097	9.301	9.485	9.653	9.808	9.951	10.08	10.21	10.32	10.43	10.54
7	4.949	5.919	6.543	7.005	7.373	7.679	7.939	8.166	8.368	8.548	8.711	8.860	8.997	9.124	9.242	9.353	9.456	9.554	9.646
8	4.746	5.635	6.204	6.625	6.960	7.237	7.474	7.681	7.863	8.027	8.176	8.312	8.436	8.552	8.659	8.760	8.854	8.943	9.027
9	4.596	5.428	5.957	6.348	6.658	6.915	7.134	7.325	7.495	7.647	7.784	7.910	8.025	8.132	8.232	8.325	8.412	8.495	8.573
10	4.482	5.270	5.769	6.136	6.428	6.669	6.875	7.055	7.213	7.326	7.485	7.603	7.712	7.812	7.906	7.993	8.076	8.153	8.226
11	4.392	5.146	5.621	5.970	6.247	6.476	6.672	6.842	6.992	7.128	7.250	7.362	7.465	7.560	7.649	7.732	7.809	7.883	7.952
12	4.320	5.046	5.502	5.836	6.101	6.321	6.507	6.670	6.814	6.943	7.060	7.167	7.265	7.356	7.441	7.520	7.594	7.665	7.731
13	4.260	4.964	5.404	5.727	5.981	6.192	6.372	6.528	6.667	6.791	6.903	7.006	7.101	7.188	7.269	7.345	7.417	7.485	7.548
14	4.210	4.895	5.322	5.634	5.881	6.085	6.258	6.409	6.543	6.664	6.772	6.871	6.962	7.047	7.126	7.199	7.268	7.333	7.395
15	4.168	4.836	5.252	5.556	5.796	5.994	6.162	6.309	6.439	6.555	6.660	6.757	6.845	6.927	7.003	7.074	7.142	7.204	7.264
16	4.131	4.786	5.192	5.489	5.722	5.915	6.079	6.222	6.349	6.462	6.564	6.658	6.744	6.823	6.898	6.967	7.032	7.093	7.152
17	4.099	4.742	5.140	5.430	5.659	5.847	6.007	6.147	6.270	6.381	6.480	6.572	6.656	6.732	6.806	6.873	6.937	6.997	7.053
18	4.071	4.703	5.094	5.379	5.603	5.788	5.944	6.081	6.201	6.310	6.407	6.497	6.579	6.655	6.725	6.792	6.854	6.912	6.968
19	4.046	4.670	5.054	5.334	5.554	5.735	5.889	6.022	6.141	6.247	6.342	6.430	6.510	6.585	6.654	6.719	6.780	6.837	6.891
20	4.024	4.639	5.018	5.294	5.510	5.688	5.839	5.970	6.087	6.191	6.285	6.371	6.450	6.523	6.591	6.654	6.714	6.771	6.823
24	3.956	4.546	4.907	5.168	5.374	5.542	5.685	5.809	5.919	6.017	6.106	6.186	6.261	6.330	6.394	6.453	6.510	6.563	6.612
30	3.889	4.455	4.799	5.048	5.242	5.401	5.536	5.653	5.756	5.849	5.932	6.008	6.078	6.143	6.203	6.259	6.311	6.361	6.407
40	3.825	4.367	4.696	4.931	5.114	5.256	5.392	5.502	5.599	5.686	5.764	5.835	5.900	5.961	6.017	6.069	6.119	6.165	6.209
60	3.762	4.282	4.595	4.818	4.991	5.133	5.253	5.356	5.447	5.528	5.601	5.667	5.728	5.785	5.837	5.886	5.931	5.974	6.015
120	3.702	4.200	4.497	4.709	4.872	5.005	5.118	5.214	5.299	5.375	5.443	5.505	5.562	5.614	5.662	5.708	5.750	5.790	5.827
$\infty$	3.643	4.120	4.403	4.603	4.757	4.882	4.987	5.078	5.157	5.227	5.290	5.348	5.400	5.448	5.493	5.535	5.574	5.611	5.645

## N

 Critical Values of the  $q$ -Distribution ( $\alpha = 0.001$ ) (cont.)

<i>df</i>	<i>k</i>																		
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	900.3	1351.	1643.	1856.	2022.	2158.	2272.	2370.	2455.	2532.	2600.	2662.	2718.	2770.	2818.	2863.	2904.	2943.	2980.
2	44.69	60.42	70.77	78.43	84.49	89.46	93.67	97.30	100.5	103.3	105.9	108.2	110.4	112.3	114.2	115.9	117.4	118.9	120.3
3	18.28	23.32	26.65	29.13	31.11	32.74	34.12	35.33	36.39	37.34	38.20	38.98	39.69	40.35	40.97	41.54	42.07	42.58	43.05
4	12.18	14.99	16.84	18.23	19.34	20.26	21.04	21.73	22.33	22.87	23.36	23.81	24.21	24.59	24.94	25.27	25.58	25.87	26.14
5	9.714	11.67	12.96	13.93	14.71	15.35	15.90	16.38	16.81	17.18	17.53	17.85	18.13	18.41	18.66	18.89	19.10	19.31	19.51
6	8.427	9.960	10.97	11.72	12.32	12.83	13.26	13.63	13.97	14.27	14.54	14.79	15.01	15.22	15.42	15.60	15.78	15.94	16.09
7	7.648	8.930	9.768	10.40	10.90	11.32	11.68	11.99	12.27	12.52	12.74	12.95	13.14	13.32	13.48	13.64	13.78	13.92	14.04
8	7.130	8.250	8.978	9.522	9.958	10.32	10.64	10.91	11.15	11.36	11.56	11.74	11.91	12.06	12.21	12.34	12.47	12.59	12.70
9	6.762	7.768	8.419	8.906	9.295	9.619	9.897	10.14	10.36	10.55	10.73	10.89	11.03	11.18	11.30	11.42	11.54	11.64	11.75
10	6.487	7.411	8.006	8.450	8.804	9.099	9.352	9.573	9.769	9.946	10.11	10.25	10.39	10.52	10.64	10.75	10.85	10.95	11.03
11	6.275	7.136	7.687	8.098	8.426	8.699	8.933	9.138	9.319	9.482	9.630	9.766	9.892	10.01	10.12	10.22	10.31	10.41	10.49
12	6.106	6.917	7.436	7.821	8.127	8.383	8.601	8.793	8.962	9.115	9.254	9.381	9.498	9.606	9.707	9.802	9.891	9.975	10.06
13	5.970	6.740	7.231	7.595	7.885	8.126	8.333	8.513	8.673	8.817	8.948	9.068	9.178	9.281	9.376	9.466	9.550	9.629	9.704
14	5.856	6.594	7.062	7.409	7.685	7.915	8.110	8.282	8.434	8.571	8.696	8.809	8.914	9.012	9.103	9.188	9.267	9.343	9.414
15	5.760	6.470	6.920	7.252	7.517	7.736	7.925	8.088	8.234	8.365	8.483	8.592	8.693	8.786	8.872	8.954	9.030	9.102	9.170
16	5.678	6.365	6.799	7.119	7.374	7.585	7.766	7.923	8.063	8.189	8.303	8.407	8.504	8.593	8.676	8.755	8.828	8.897	8.963
17	5.608	6.275	6.695	7.005	7.250	7.454	7.629	7.781	7.916	8.037	8.148	8.248	8.342	8.427	8.508	8.583	8.654	8.720	8.784
18	5.546	6.196	6.604	6.905	7.143	7.341	7.510	7.657	7.788	7.906	8.012	8.110	8.199	8.283	8.361	8.434	8.502	8.567	8.628
19	5.492	6.127	6.525	6.817	7.049	7.242	7.405	7.549	7.676	7.790	7.893	7.988	8.075	8.156	8.232	8.303	8.369	8.432	8.491
20	5.444	6.065	6.454	6.740	6.966	7.154	7.313	7.453	7.577	7.688	7.788	7.880	7.966	8.044	8.118	8.186	8.251	8.312	8.370
24	5.297	5.877	6.238	6.503	6.712	6.884	7.031	7.159	7.272	7.374	7.467	7.551	7.629	7.701	7.768	7.831	7.890	7.946	7.999
30	5.156	5.698	6.033	6.278	6.470	6.628	6.763	6.880	6.984	7.077	7.162	7.239	7.310	7.375	7.437	7.494	7.548	7.599	7.647
40	5.022	5.528	5.838	6.063	6.240	6.386	6.509	6.616	6.711	6.796	6.872	6.942	7.007	7.067	7.122	7.174	7.223	7.269	7.312
60	4.894	5.365	5.653	5.860	6.022	6.155	6.268	6.366	6.451	6.528	6.598	6.661	6.720	6.774	6.824	6.871	6.914	6.956	6.995
120	4.771	5.211	5.476	5.667	5.815	5.937	6.039	6.128	6.206	6.276	6.339	6.396	6.448	6.496	6.542	6.583	6.623	6.660	6.695
$\infty$	4.654	5.063	5.309	5.484	5.619	5.730	5.823	5.903	5.973	6.036	6.092	6.144	6.191	6.234	6.274	6.312	6.347	6.380	6.411