STATISTICAL TABLES

Dr. Shabbir Ahmad

Assistant Professor, Department of Mathematics

COMSATS University Islamabad

Wah Campus

Date: Monday, September 21, 2020 (5:09 PM)

Dr. Shabbir Ahmad
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List of Tables

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Areas of a Standard Normal Distribution 0 to *Z*

Z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.0000	0.0040	0.0080	0.0120	0.0160	0.0199	0.0239	0.0279	0.0319	0.0359
0.1	0.0398	0.0438	0.0478	0.0517	0.0557	0.0596	0.0636	0.0675	0.0714	0.0753
0.2	0.0793	0.0832	0.0871	0.0910	0.0948	0.0987	0.1026	0.1064	0.1103	0.1141
0.3	0.1179	0.1217	0.1255	0.1293	0.1331	0.1368	0.1406	0.1443	0.1480	0.1517
0.4	0.1554	0.1591	0.1628	0.1664	0.1700	0.1736	0.1772	0.1808	0.1844	0.1879
0.5	0.1915	0.1950	0.1985	0.2019	0.2054	0.2088	0.2123	0.2157	0.2190	0.2224
0.6	0.2257	0.2291	0.2324	0.2357	0.2389	0.2422	0.2454	0.2486	0.2517	0.2549
0.7	0.2580	0.2611	0.2642	0.2673	0.2704	0.2734	0.2764	0.2794	0.2823	0.2852
0.8	0.2881	0.2910	0.2939	0.2967	0.2995	0.3023	0.3051	0.3078	0.3106	0.3133
0.9	0.3159	0.3186	0.3212	0.3238	0.3264	0.3289	0.3315	0.3340	0.3365	0.3389
1.0	0.3413	0.3438	0.3461	0.3485	0.3508	0.3531	0.3554	0.3577	0.3599	0.3621
1.1	0.3643	0.3665	0.3686	0.3708	0.3729	0.3749	0.3770	0.3790	0.3810	0.3830
1.2	0.3849	0.3869	0.3888	0.3907	0.3925	0.3944	0.3962	0.3980	0.3997	0.4015
1.3	0.4032	0.4049	0.4066	0.4082	0.4099	0.4115	0.4131	0.4147	0.4162	0.4177
1.4	0.4192	0.4207	0.4222	0.4236	0.4251	0.4265	0.4279	0.4292	0.4306	0.4319
1.5	0.4332	0.4345	0.4357	0.4370	0.4382	0.4394	0.4406	0.4418	0.4429	0.4441
1.6	0.4452	0.4463	0.4474	0.4484	0.4495	0.4505	0.4515	0.4525	0.4535	0.4545
1.7	0.4554	0.4564	0.4573	0.4582	0.4591	0.4599	0.4608	0.4616	0.4625	0.4633
1.8	0.4641	0.4649	0.4656	0.4664	0.4671	0.4678	0.4686	0.4693	0.4699	0.4706
1.9	0.4713	0.4719	0.4726	0.4732	0.4738	0.4744	0.4750	0.4756	0.4761	0.4767
2.0	0.4772	0.4778	0.4783	0.4788	0.4793	0.4798	0.4803	0.4808	0.4812	0.4817
2.1	0.4821	0.4826	0.4830	0.4834	0.4838	0.4842	0.4846	0.4850	0.4854	0.4857
2.2	0.4861	0.4864	0.4868	0.4871	0.4875	0.4878	0.4881	0.4884	0.4887	0.4890
2.3	0.4893	0.4896	0.4898	0.4901	0.4904	0.4906	0.4909	0.4911	0.4913	0.4916
2.4	0.4918	0.4920	0.4922	0.4925	0.4927	0.4929	0.4931	0.4932	0.4934	0.4936
2.5	0.4938	0.4940	0.4941	0.4943	0.4945	0.4946	0.4948	0.4949	0.4951	0.4952
2.6	0.4953	0.4955	0.4956	0.4957	0.4959	0.4960	0.4961	0.4962	0.4963	0.4964
2.7	0.4965	0.4966	0.4967	0.4968	0.4969	0.4970	0.4971	0.4972	0.4973	0.4974
2.8	0.4974	0.4975	0.4976	0.4977	0.4977	0.4978	0.4979	0.4979	0.4980	0.4981
2.9	0.4981	0.4982	0.4982	0.4983	0.4984	0.4984	0.4985	0.4985	0.4986	0.4986
3.0	0.4987	0.4987	0.4987	0.4988	0.4988	0.4989	0.4989	0.4989	0.4990	0.4990
3.1	0.4990	0.4991	0.4991	0.4991	0.4992	0.4992	0.4992	0.4992	0.4993	0.4993
3.2	0.4993	0.4993	0.4994	0.4994	0.4994	0.4994	0.4994	0.4995	0.4995	0.4995
3.3	0.4995	0.4995	0.4995	0.4996	0.4996	0.4996	0.4996	0.4996	0.4996	0.4997
3.4	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4998
3.5	0.4998	0.4998	0.4998	0.4998	0.4998	0.4998	0.4998	0.4998	0.4998	0.4998
3.6	0.4998	0.4998	0.4998	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999

Note: For values of *z* greater than or equal to 3.70, use 0.4999 to approximate the shaded area under the standard normal curve.

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Critical Values for Z Test

$100(1-\alpha)\%$	α	One Tail Test	Two Tail Test
99%	0.01	2.326	2.576
98%	0.02	2.054	2.326
97%	0.03	1.881	2.170
96%	0.04	1.751	2.054
95%	0.05	1.645	1.960
94%	0.06	1.555	1.881
93%	0.07	1.476	1.812
92%	0.08	1.405	1.751
91%	0.09	1.341	1.695
90%	0.10	1.282	1.645
89%	0.11	1.227	1.598
88%	0.12	1.175	1.555
87%	0.13	1.126	1.514
86%	0.14	1.080	1.476
85%	0.15	1.036	1.440
84%	0.16	0.994	1.405
83%	0.17	0.954	1.372
82%	0.18	0.915	1.341
81%	0.19	0.878	1.311
80%	0.20	0.842	1.282

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Critical Values for *t* Test

Degree of Freedom	Level of Significance							
	Two Tailed Test	20%	10%	5%	2%	1%	0.2%	0.1%
	One Tailed Test	10%	5%	2.5%	1%	0.5%	0.1%	0.05%
1		3.078	6.314	12.706	31.821	63.657	318.309	636.619
2		1.886	2.920	4.303	6.965	9.925	22.327	31.599
3		1.638	2.353	3.182	4.541	5.841	10.215	12.924
4		1.533	2.132	2.776	3.747	4.604	7.173	8.610
5		1.476	2.015	2.571	3.365	4.032	5.893	6.869
6		1.440	1.943	2.447	3.143	3.707	5.208	5.959
7		1.415	1.895	2.365	2.998	3.499	4.785	5.408
8		1.397	1.860	2.306	2.896	3.355	4.501	5.041
9		1.383	1.833	2.262	2.821	3.250	4.297	4.781
10		1.372	1.812	2.228	2.764	3.169	4.144	4.587
11		1.363	1.796	2.201	2.718	3.106	4.025	4.437
12		1.356	1.782	2.179	2.681	3.055	3.930	4.318
13		1.350	1.771	2.160	2.650	3.012	3.852	4.221
14		1.345	1.761	2.145	2.624	2.977	3.787	4.140
15		1.341	1.753	2.131	2.602	2.947	3.733	4.073
16		1.337	1.746	2.120	2.583	2.921	3.686	4.015
17		1.333	1.740	2.110	2.567	2.898	3.646	3.965
18		1.330	1.734	2.101	2.552	2.878	3.610	3.922
19		1.328	1.729	2.093	2.539	2.861	3.579	3.883
20		1.325	1.725	2.086	2.528	2.845	3.552	3.850
21		1.323	1.721	2.080	2.518	2.831	3.527	3.819
22		1.321	1.717	2.074	2.508	2.819	3.505	3.792
23		1.319	1.714	2.069	2.500	2.807	3.485	3.768
24		1.318	1.711	2.064	2.492	2.797	3.467	3.745
25		1.316	1.708	2.060	2.485	2.787	3.450	3.725
26		1.315	1.706	2.056	2.479	2.779	3.435	3.707
27		1.314	1.703	2.052	2.473	2.771	3.421	3.690
28		1.313	1.701	2.048	2.467	2.763	3.408	3.674
29		1.311	1.699	2.045	2.462	2.756	3.396	3.659
30		1.310	1.697	2.042	2.457	2.750	3.385	3.646
31		1.309	1.696	2.040	2.453	2.744	3.375	3.633
32		1.309	1.694	2.037	2.449	2.738	3.365	3.622
33		1.308	1.692	2.035	2.445	2.733	3.356	3.611
34		1.307	1.691	2.032	2.441	2.728	3.348	3.601
35		1.306	1.690	2.030	2.438	2.724	3.340	3.591
36		1.306	1.688	2.028	2.434	2.719	3.333	3.582
37		1.305	1.687	2.026	2.431	2.715	3.326	3.574
38		1.304	1.686	2.024	2.429	2.712	3.319	3.566
39		1.304	1.685	2.023	2.426	2.708	3.313	3.558
40		1.303	1.684	2.021	2.423	2.704	3.307	3.551

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Critical Values for *t* Test (continue..)

Degree of freedom	Level of Significance						
	Two Tailed Test	10%	5%	2%	1%	0.2%	0.1%
	One Tailed Test	5%	2.5%	1%	0.5%	0.1%	0.05%
41		1.683	2.020	2.421	2.701	3.301	3.544
42		1.682	2.018	2.418	2.698	3.296	3.538
43		1.681	2.017	2.416	2.695	3.291	3.532
44		1.680	2.015	2.414	2.692	3.286	3.526
45		1.679	2.014	2.412	2.690	3.281	3.520
46		1.679	2.013	2.410	2.687	3.277	3.515
47		1.678	2.012	2.408	2.685	3.273	3.510
48		1.677	2.011	2.407	2.682	3.269	3.505
49		1.677	2.010	2.405	2.680	3.265	3.500
50		1.676	2.009	2.403	2.678	3.261	3.496
51		1.675	2.008	2.402	2.676	3.258	3.492
52		1.675	2.007	2.400	2.674	3.255	3.488
53		1.674	2.006	2.399	2.672	3.251	3.484
54		1.674	2.005	2.397	2.670	3.248	3.480
55		1.673	2.004	2.396	2.668	3.245	3.476
56		1.673	2.003	2.395	2.667	3.242	3.473
57		1.672	2.002	2.394	2.665	3.239	3.470
58		1.672	2.002	2.392	2.663	3.237	3.466
59		1.671	2.001	2.391	2.662	3.234	3.463
60		1.671	2.000	2.390	2.660	3.232	3.460
61		1.670	2.000	2.389	2.659	3.229	3.457
62		1.670	1.999	2.388	2.657	3.227	3.454
63		1.669	1.998	2.387	2.656	3.225	3.452
64		1.669	1.998	2.386	2.655	3.223	3.449
65		1.669	1.997	2.385	2.654	3.220	3.447
66		1.668	1.997	2.384	2.652	3.218	3.444
67		1.668	1.996	2.383	2.651	3.216	3.442
68		1.668	1.995	2.382	2.650	3.214	3.439
69		1.667	1.995	2.382	2.649	3.213	3.437
70		1.667	1.994	2.381	2.648	3.211	3.435
71		1.667	1.994	2.380	2.647	3.209	3.433
72		1.666	1.993	2.379	2.646	3.207	3.431
73		1.666	1.993	2.379	2.645	3.206	3.429
74		1.666	1.993	2.378	2.644	3.204	3.427
75		1.665	1.992	2.377	2.643	3.202	3.425
76		1.665	1.992	2.376	2.642	3.201	3.423
77		1.665	1.991	2.376	2.641	3.199	3.421
78		1.665	1.991	2.375	2.640	3.198	3.420
79		1.664	1.990	2.374	2.640	3.197	3.418
80		1.664	1.990	2.374	2.639	3.195	3.416

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Critical Values for *t* Test (continue..)

Degree of freedom	Level of Significance						
	Two Tailed Test	10%	5%	2%	1%	0.2%	0.1%
	One Tailed Test	5%	2.5%	1%	0.5%	0.1%	0.05%
81		1.664	1.990	2.373	2.638	3.194	3.415
82		1.664	1.989	2.373	2.637	3.193	3.413
83		1.663	1.989	2.372	2.636	3.191	3.412
84		1.663	1.989	2.372	2.636	3.190	3.410
85		1.663	1.988	2.371	2.635	3.189	3.409
86		1.663	1.988	2.370	2.634	3.188	3.407
87		1.663	1.988	2.370	2.634	3.187	3.406
88		1.662	1.987	2.369	2.633	3.185	3.405
89		1.662	1.987	2.369	2.632	3.184	3.403
90		1.662	1.987	2.368	2.632	3.183	3.402
91		1.662	1.986	2.368	2.631	3.182	3.401
92		1.662	1.986	2.368	2.630	3.181	3.399
93		1.661	1.986	2.367	2.630	3.180	3.398
94		1.661	1.986	2.367	2.629	3.179	3.397
95		1.661	1.985	2.366	2.629	3.178	3.396
96		1.661	1.985	2.366	2.628	3.177	3.395
97		1.661	1.985	2.365	2.627	3.176	3.394
98		1.661	1.984	2.365	2.627	3.175	3.393
99		1.660	1.984	2.365	2.626	3.175	3.392
100		1.660	1.984	2.364	2.626	3.174	3.390
∞		1.645	1.960	2.326	2.576	3.090	3.291

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Critical Values for Chi-Square Test $\chi^2_{\alpha,(df)}$

Degree of Freedom	Level of Significance								
	99%	98.0%	97.5%	95%	10%	5%	2.5%	2%	1%
1	0.0002	0.001	0.001	0.004	2.706	3.841	5.024	5.412	6.635
2	0.020	0.040	0.051	0.103	4.605	5.991	7.378	7.824	9.210
3	0.115	0.185	0.216	0.352	6.251	7.815	9.348	9.837	11.345
4	0.297	0.429	0.484	0.711	7.779	9.488	11.143	11.668	13.277
5	0.554	0.752	0.831	1.145	9.236	11.070	12.833	13.388	15.086
6	0.872	1.134	1.237	1.635	10.645	12.592	14.449	15.033	16.812
7	1.239	1.564	1.690	2.167	12.017	14.067	16.013	16.622	18.475
8	1.646	2.032	2.180	2.733	13.362	15.507	17.535	18.168	20.090
9	2.088	2.532	2.700	3.325	14.684	16.919	19.023	19.679	21.666
10	2.558	3.059	3.247	3.940	15.987	18.307	20.483	21.161	23.209
11	3.053	3.609	3.816	4.575	17.275	19.675	21.920	22.618	24.725
12	3.571	4.178	4.404	5.226	18.549	21.026	23.337	24.054	26.217
13	4.107	4.765	5.009	5.892	19.812	22.362	24.736	25.472	27.688
14	4.660	5.368	5.629	6.571	21.064	23.685	26.119	26.873	29.141
15	5.229	5.985	6.262	7.261	22.307	24.996	27.488	28.259	30.578
16	5.812	6.614	6.908	7.962	23.542	26.296	28.845	29.633	32.000
17	6.408	7.255	7.564	8.672	24.769	27.587	30.191	30.995	33.409
18	7.015	7.906	8.231	9.390	25.989	28.869	31.526	32.346	34.805
19	7.633	8.567	8.907	10.117	27.204	30.144	32.852	33.687	36.191
20	8.260	9.237	9.591	10.851	28.412	31.410	34.170	35.020	37.566
21	8.897	9.915	10.283	11.591	29.615	32.671	35.479	36.343	38.932
22	9.542	10.600	10.982	12.338	30.813	33.924	36.781	37.659	40.289
23	10.196	11.293	11.689	13.091	32.007	35.172	38.076	38.968	41.638
24	10.856	11.992	12.401	13.848	33.196	36.415	39.364	40.270	42.980
25	11.524	12.697	13.120	14.611	34.382	37.652	40.646	41.566	44.314
26	12.198	13.409	13.844	15.379	35.563	38.885	41.923	42.856	45.642
27	12.879	14.125	14.573	16.151	36.741	40.113	43.195	44.140	46.963
28	13.565	14.847	15.308	16.928	37.916	41.337	44.461	45.419	48.278
29	14.256	15.574	16.047	17.708	39.087	42.557	45.722	46.693	49.588
30	14.953	16.306	16.791	18.493	40.256	43.773	46.979	47.962	50.892
31	15.655	17.042	17.539	19.281	41.422	44.985	48.232	49.226	52.191
32	16.362	17.783	18.291	20.072	42.585	46.194	49.480	50.487	53.486
33	17.074	18.527	19.047	20.867	43.745	47.400	50.725	51.743	54.776
34	17.789	19.275	19.806	21.664	44.903	48.602	51.966	52.995	56.061
35	18.509	20.027	20.569	22.465	46.059	49.802	53.203	54.244	57.342
36	19.233	20.783	21.336	23.269	47.212	50.998	54.437	55.489	58.619
37	19.960	21.542	22.106	24.075	48.363	52.192	55.668	56.730	59.893
38	20.691	22.304	22.878	24.884	49.513	53.384	56.896	57.969	61.162
39	21.426	23.069	23.654	25.695	50.660	54.572	58.120	59.204	62.428
40	22.164	23.838	24.433	26.509	51.805	55.758	59.342	60.436	63.691

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Critical Values for Chi-Square Test $\chi^2_{\alpha,(df)}$ (continue..)

Degree of Freedom	Level of Significance								
	99%	98.0%	97.5%	95%	10%	5%	2.5%	2%	1%
41	22.906	24.609	25.215	27.326	52.949	56.942	60.561	61.665	64.950
42	23.650	25.383	25.999	28.144	54.090	58.124	61.777	62.892	66.206
43	24.398	26.159	26.785	28.965	55.230	59.304	62.990	64.116	67.459
44	25.148	26.939	27.575	29.787	56.369	60.481	64.201	65.337	68.710
45	25.901	27.720	28.366	30.612	57.505	61.656	65.410	66.555	69.957
46	26.657	28.505	29.160	31.439	58.641	62.830	66.617	67.771	71.201
47	27.416	29.291	29.956	32.268	59.774	64.001	67.821	68.985	72.443
48	28.177	30.080	30.755	33.098	60.907	65.171	69.023	70.197	73.683
49	28.941	30.871	31.555	33.930	62.038	66.339	70.222	71.406	74.919
50	29.707	31.664	32.357	34.764	63.167	67.505	71.420	72.613	76.154
51	30.475	32.459	33.162	35.600	64.295	68.669	72.616	73.818	77.386
52	31.246	33.256	33.968	36.437	65.422	69.832	73.810	75.021	78.616
53	32.018	34.055	34.776	37.276	66.548	70.993	75.002	76.223	79.843
54	32.793	34.856	35.586	38.116	67.673	72.153	76.192	77.422	81.069
55	33.570	35.659	36.398	38.958	68.796	73.311	77.380	78.619	82.292
56	34.350	36.464	37.212	39.801	69.919	74.468	78.567	79.815	83.513
57	35.131	37.270	38.027	40.646	71.040	75.624	79.752	81.009	84.733
58	35.913	38.078	38.844	41.492	72.160	76.778	80.936	82.201	85.950
59	36.698	38.888	39.662	42.339	73.279	77.931	82.117	83.391	87.166
60	37.485	39.699	40.482	43.188	74.397	79.082	83.298	84.580	88.379
61	38.273	40.512	41.303	44.038	75.514	80.232	84.476	85.767	89.591
62	39.063	41.327	42.126	44.889	76.630	81.381	85.654	86.953	90.802
63	39.855	42.143	42.950	45.741	77.745	82.529	86.830	88.137	92.010
64	40.649	42.960	43.776	46.595	78.860	83.675	88.004	89.320	93.217
65	41.444	43.779	44.603	47.450	79.973	84.821	89.177	90.501	94.422
66	42.240	44.599	45.431	48.305	81.085	85.965	90.349	91.681	95.626
67	43.038	45.421	46.261	49.162	82.197	87.108	91.519	92.860	96.828
68	43.838	46.244	47.092	50.020	83.308	88.250	92.689	94.037	98.028
69	44.639	47.068	47.924	50.879	84.418	89.391	93.856	95.213	99.228
70	45.442	47.893	48.758	51.739	85.527	90.531	95.023	96.388	100.425
71	46.246	48.720	49.592	52.600	86.635	91.670	96.189	97.561	101.621
72	47.051	49.548	50.428	53.462	87.743	92.808	97.353	98.733	102.816
73	47.858	50.377	51.265	54.325	88.850	93.945	98.516	99.904	104.010
74	48.666	51.208	52.103	55.189	89.956	95.081	99.678	101.074	105.202
75	49.475	52.039	52.942	56.054	91.061	96.217	100.839	102.243	106.393
76	50.286	52.872	53.782	56.920	92.166	97.351	101.999	103.410	107.583
77	51.097	53.705	54.623	57.786	93.270	98.484	103.158	104.576	108.771
78	51.910	54.540	55.466	58.654	94.374	99.617	104.316	105.742	109.958
79	52.725	55.376	56.309	59.522	95.476	100.749	105.473	106.906	111.144
80	53.540	56.213	57.153	60.391	96.578	101.879	106.629	108.069	112.329

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Critical Values for Chi-Square Test $\chi^2_{\alpha,(df)}$ (continue..)

Degree of Freedom	Level of Significance								
	99%	98.0%	97.5%	95%	10%	5%	2.5%	2%	1%
81	54.357	57.051	57.998	61.261	97.680	103.010	107.783	109.232	113.512
82	55.174	57.890	58.845	62.132	98.780	104.139	108.937	110.393	114.695
83	55.993	58.729	59.692	63.004	99.880	105.267	110.090	111.553	115.876
84	56.813	59.570	60.540	63.876	100.980	106.395	111.242	112.712	117.057
85	57.634	60.412	61.389	64.749	102.079	107.522	112.393	113.871	118.236
86	58.456	61.255	62.239	65.623	103.177	108.648	113.544	115.028	119.414
87	59.279	62.098	63.089	66.498	104.275	109.773	114.693	116.184	120.591
88	60.103	62.943	63.941	67.373	105.372	110.898	115.841	117.340	121.767
89	60.928	63.788	64.793	68.249	106.469	112.022	116.989	118.495	122.942
90	61.754	64.635	65.647	69.126	107.565	113.145	118.136	119.648	124.116
91	62.581	65.482	66.501	70.003	108.661	114.268	119.282	120.801	125.289
92	63.409	66.330	67.356	70.882	109.756	115.390	120.427	121.954	126.462
93	64.238	67.179	68.211	71.760	110.850	116.511	121.571	123.105	127.633
94	65.068	68.028	69.068	72.640	111.944	117.632	122.715	124.255	128.803
95	65.898	68.879	69.925	73.520	113.038	118.752	123.858	125.405	129.973
96	66.730	69.730	70.783	74.401	114.131	119.871	125.000	126.554	131.141
97	67.562	70.582	71.642	75.282	115.223	120.990	126.141	127.702	132.309
98	68.396	71.434	72.501	76.164	116.315	122.108	127.282	128.849	133.476
99	69.230	72.288	73.361	77.046	117.407	123.225	128.422	129.996	134.642
100	70.065	73.142	74.222	77.929	118.498	124.342	129.561	131.142	135.807

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Critical Values of F-Test at 1% Significance level $F_{0.01,(df_n,df_d)}$

$df_n \rightarrow$ $df_d \downarrow$	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	4052.18	4999.50	5403.35	5624.58	5763.65	5858.99	5928.36	5981.07	6022.47	6055.85	6083.32	6106.32	6125.86	6142.67	6157.28	6170.10	6181.43	6191.53	6200.58	6208.73
2	98.50	99.00	99.17	99.25	99.30	99.33	99.36	99.37	99.39	99.40	99.41	99.42	99.42	99.43	99.43	99.44	99.44	99.44	99.45	99.45
3	34.12	30.82	29.46	28.71	28.24	27.91	27.67	27.49	27.35	27.23	27.13	27.05	26.98	26.92	26.87	26.83	26.79	26.75	26.72	26.69
4	21.20	18.00	16.69	15.98	15.52	15.21	14.98	14.80	14.66	14.55	14.45	14.37	14.31	14.25	14.20	14.15	14.11	14.08	14.05	14.02
5	16.26	13.27	12.06	11.39	10.97	10.67	10.46	10.29	10.16	10.05	9.96	9.89	9.82	9.77	9.72	9.68	9.64	9.61	9.58	9.55
6	13.75	10.92	9.78	9.15	8.75	8.47	8.26	8.10	7.98	7.87	7.79	7.72	7.66	7.60	7.56	7.52	7.48	7.45	7.42	7.40
7	12.25	9.55	8.45	7.85	7.46	7.19	6.99	6.84	6.72	6.62	6.54	6.47	6.41	6.36	6.31	6.28	6.24	6.21	6.18	6.16
8	11.26	8.65	7.59	7.01	6.63	6.37	6.18	6.03	5.91	5.81	5.73	5.67	5.61	5.56	5.52	5.48	5.44	5.41	5.38	5.36
9	10.56	8.02	6.99	6.42	6.06	5.80	5.61	5.47	5.35	5.26	5.18	5.11	5.05	5.01	4.96	4.92	4.89	4.86	4.83	4.81
10	10.04	7.56	6.55	5.99	5.64	5.39	5.20	5.06	4.94	4.85	4.77	4.71	4.65	4.60	4.56	4.52	4.49	4.46	4.43	4.41
11	9.65	7.21	6.22	5.67	5.32	5.07	4.89	4.74	4.63	4.54	4.46	4.40	4.34	4.29	4.25	4.21	4.18	4.15	4.12	4.10
12	9.33	6.93	5.95	5.41	5.06	4.82	4.64	4.50	4.39	4.30	4.22	4.16	4.10	4.05	4.01	3.97	3.94	3.91	3.88	3.86
13	9.07	6.70	5.74	5.21	4.86	4.62	4.44	4.30	4.19	4.10	4.02	3.96	3.91	3.86	3.82	3.78	3.75	3.72	3.69	3.66
14	8.86	6.51	5.56	5.04	4.69	4.46	4.28	4.14	4.03	3.94	3.86	3.80	3.75	3.70	3.66	3.62	3.59	3.56	3.53	3.51
15	8.68	6.36	5.42	4.89	4.56	4.32	4.14	4.00	3.89	3.80	3.73	3.67	3.61	3.56	3.52	3.49	3.45	3.42	3.40	3.37
16	8.53	6.23	5.29	4.77	4.44	4.20	4.03	3.89	3.78	3.69	3.62	3.55	3.50	3.45	3.41	3.37	3.34	3.31	3.28	3.26
17	8.40	6.11	5.18	4.67	4.34	4.10	3.93	3.79	3.68	3.59	3.52	3.46	3.40	3.35	3.31	3.27	3.24	3.21	3.19	3.16
18	8.29	6.01	5.09	4.58	4.25	4.01	3.84	3.71	3.60	3.51	3.43	3.37	3.32	3.27	3.23	3.19	3.16	3.13	3.10	3.08
19	8.18	5.93	5.01	4.50	4.17	3.94	3.77	3.63	3.52	3.43	3.36	3.30	3.24	3.19	3.15	3.12	3.08	3.05	3.03	3.00
20	8.10	5.85	4.94	4.43	4.10	3.87	3.70	3.56	3.46	3.37	3.29	3.23	3.18	3.13	3.09	3.05	3.02	2.99	2.96	2.94
21	8.02	5.78	4.87	4.37	4.04	3.81	3.64	3.51	3.40	3.31	3.24	3.17	3.12	3.07	3.03	2.99	2.96	2.93	2.90	2.88
22	7.95	5.72	4.82	4.31	3.99	3.76	3.59	3.45	3.35	3.26	3.18	3.12	3.07	3.02	2.98	2.94	2.91	2.88	2.85	2.83
23	7.88	5.66	4.76	4.26	3.94	3.71	3.54	3.41	3.30	3.21	3.14	3.07	3.02	2.97	2.93	2.89	2.86	2.83	2.80	2.78
24	7.82	5.61	4.72	4.22	3.90	3.67	3.50	3.36	3.26	3.17	3.09	3.03	2.98	2.93	2.89	2.85	2.82	2.79	2.76	2.74
25	7.77	5.57	4.68	4.18	3.85	3.63	3.46	3.32	3.22	3.13	3.06	2.99	2.94	2.89	2.85	2.81	2.78	2.75	2.72	2.70
26	7.72	5.53	4.64	4.14	3.82	3.59	3.42	3.29	3.18	3.09	3.02	2.96	2.90	2.86	2.81	2.78	2.75	2.72	2.69	2.66
27	7.68	5.49	4.60	4.11	3.78	3.56	3.39	3.26	3.15	3.06	2.99	2.93	2.87	2.82	2.78	2.75	2.71	2.68	2.66	2.63
28	7.64	5.45	4.57	4.07	3.75	3.53	3.36	3.23	3.12	3.03	2.96	2.90	2.84	2.79	2.75	2.72	2.68	2.65	2.63	2.60
29	7.60	5.42	4.54	4.04	3.73	3.50	3.33	3.20	3.09	3.00	2.93	2.87	2.81	2.77	2.73	2.69	2.66	2.63	2.60	2.57
30	7.56	5.39	4.51	4.02	3.70	3.47	3.30	3.17	3.07	2.98	2.91	2.84	2.79	2.74	2.70	2.66	2.63	2.60	2.57	2.55

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$df_n \rightarrow$ $df_d \downarrow$	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
31	7.53	5.36	4.48	3.99	3.67	3.45	3.28	3.15	3.04	2.96	2.88	2.82	2.77	2.72	2.68	2.64	2.61	2.58	2.55	2.52
32	7.50	5.34	4.46	3.97	3.65	3.43	3.26	3.13	3.02	2.93	2.86	2.80	2.74	2.70	2.65	2.62	2.58	2.55	2.53	2.50
33	7.47	5.31	4.44	3.95	3.63	3.41	3.24	3.11	3.00	2.91	2.84	2.78	2.72	2.68	2.63	2.60	2.56	2.53	2.51	2.48
34	7.44	5.29	4.42	3.93	3.61	3.39	3.22	3.09	2.98	2.89	2.82	2.76	2.70	2.66	2.61	2.58	2.54	2.51	2.49	2.46
35	7.42	5.27	4.40	3.91	3.59	3.37	3.20	3.07	2.96	2.88	2.80	2.74	2.69	2.64	2.60	2.56	2.53	2.50	2.47	2.44
36	7.40	5.25	4.38	3.89	3.57	3.35	3.18	3.05	2.95	2.86	2.79	2.72	2.67	2.62	2.58	2.54	2.51	2.48	2.45	2.43
37	7.37	5.23	4.36	3.87	3.56	3.33	3.17	3.04	2.93	2.84	2.77	2.71	2.65	2.61	2.56	2.53	2.49	2.46	2.44	2.41
38	7.35	5.21	4.34	3.86	3.54	3.32	3.15	3.02	2.92	2.83	2.75	2.69	2.64	2.59	2.55	2.51	2.48	2.45	2.42	2.40
39	7.33	5.19	4.33	3.84	3.53	3.30	3.14	3.01	2.90	2.81	2.74	2.68	2.62	2.58	2.54	2.50	2.46	2.43	2.41	2.38
40	7.31	5.18	4.31	3.83	3.51	3.29	3.12	2.99	2.89	2.80	2.73	2.66	2.61	2.56	2.52	2.48	2.45	2.42	2.39	2.37
41	7.30	5.16	4.30	3.81	3.50	3.28	3.11	2.98	2.87	2.79	2.71	2.65	2.60	2.55	2.51	2.47	2.44	2.41	2.38	2.36
42	7.28	5.15	4.29	3.80	3.49	3.27	3.10	2.97	2.86	2.78	2.70	2.64	2.59	2.54	2.50	2.46	2.43	2.40	2.37	2.34
43	7.26	5.14	4.27	3.79	3.48	3.25	3.09	2.96	2.85	2.76	2.69	2.63	2.57	2.53	2.49	2.45	2.41	2.38	2.36	2.33
44	7.25	5.12	4.26	3.78	3.47	3.24	3.08	2.95	2.84	2.75	2.68	2.62	2.56	2.52	2.47	2.44	2.40	2.37	2.35	2.32
45	7.23	5.11	4.25	3.77	3.45	3.23	3.07	2.94	2.83	2.74	2.67	2.61	2.55	2.51	2.46	2.43	2.39	2.36	2.34	2.31
46	7.22	5.10	4.24	3.76	3.44	3.22	3.06	2.93	2.82	2.73	2.66	2.60	2.54	2.50	2.45	2.42	2.38	2.35	2.33	2.30
47	7.21	5.09	4.23	3.75	3.43	3.21	3.05	2.92	2.81	2.72	2.65	2.59	2.53	2.49	2.44	2.41	2.37	2.34	2.32	2.29
48	7.19	5.08	4.22	3.74	3.43	3.20	3.04	2.91	2.80	2.71	2.64	2.58	2.53	2.48	2.44	2.40	2.37	2.33	2.31	2.28
49	7.18	5.07	4.21	3.73	3.42	3.19	3.03	2.90	2.79	2.71	2.63	2.57	2.52	2.47	2.43	2.39	2.36	2.33	2.30	2.27
50	7.17	5.06	4.20	3.72	3.41	3.19	3.02	2.89	2.78	2.70	2.63	2.56	2.51	2.46	2.42	2.38	2.35	2.32	2.29	2.27
55	7.12	5.01	4.16	3.68	3.37	3.15	2.98	2.85	2.75	2.66	2.59	2.53	2.47	2.42	2.38	2.34	2.31	2.28	2.25	2.23
60	7.08	4.98	4.13	3.65	3.34	3.12	2.95	2.82	2.72	2.63	2.56	2.50	2.44	2.39	2.35	2.31	2.28	2.25	2.22	2.20
65	7.04	4.95	4.10	3.62	3.31	3.09	2.93	2.80	2.69	2.61	2.53	2.47	2.42	2.37	2.33	2.29	2.26	2.23	2.20	2.17
70	7.01	4.92	4.07	3.60	3.29	3.07	2.91	2.78	2.67	2.59	2.51	2.45	2.40	2.35	2.31	2.27	2.23	2.20	2.18	2.15
75	6.99	4.90	4.05	3.58	3.27	3.05	2.89	2.76	2.65	2.57	2.49	2.43	2.38	2.33	2.29	2.25	2.22	2.18	2.16	2.13
80	6.96	4.88	4.04	3.56	3.26	3.04	2.87	2.74	2.64	2.55	2.48	2.42	2.36	2.31	2.27	2.23	2.20	2.17	2.14	2.12
85	6.94	4.86	4.02	3.55	3.24	3.02	2.86	2.73	2.62	2.54	2.46	2.40	2.35	2.30	2.26	2.22	2.19	2.15	2.13	2.10
90	6.93	4.85	4.01	3.53	3.23	3.01	2.84	2.72	2.61	2.52	2.45	2.39	2.33	2.29	2.24	2.21	2.17	2.14	2.11	2.09
95	6.91	4.84	3.99	3.52	3.22	3.00	2.83	2.70	2.60	2.51	2.44	2.38	2.32	2.28	2.23	2.20	2.16	2.13	2.10	2.08
100	6.90	4.82	3.98	3.51	3.21	2.99	2.82	2.69	2.59	2.50	2.43	2.37	2.31	2.27	2.22	2.19	2.15	2.12	2.09	2.07
110	6.88	4.81	3.97	3.50	3.20	2.98	2.81	2.69	2.58	2.49	2.42	2.36	2.30	2.26	2.21	2.18	2.14	2.11	2.08	2.06
120	6.87	4.80	3.96	3.49	3.19	2.97	2.81	2.68	2.57	2.49	2.41	2.35	2.30	2.25	2.21	2.17	2.13	2.10	2.07	2.05

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Critical Values of F-Test at 2% Significance level $F_{0.02,(df_n,df_d)}$

$df_n \rightarrow$ $df_d \downarrow$	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	1012.55	1249.50	1350.50	1405.83	1440.61	1464.45	1481.80	1494.99	1505.34	1513.69	1520.56	1526.31	1531.20	1535.40	1539.05	1542.26	1545.09	1547.62	1549.88	1551.92
2	48.51	49.00	49.17	49.25	49.30	49.33	49.36	49.37	49.39	49.40	49.41	49.42	49.42	49.43	49.43	49.44	49.44	49.44	49.45	49.45
3	20.62	18.86	18.11	17.69	17.43	17.25	17.11	17.01	16.93	16.86	16.81	16.76	16.72	16.69	16.66	16.63	16.61	16.59	16.57	16.55
4	14.04	12.14	11.34	10.90	10.62	10.42	10.27	10.16	10.07	10.00	9.94	9.89	9.85	9.81	9.78	9.75	9.73	9.71	9.69	9.67
5	11.32	9.45	8.67	8.23	7.95	7.76	7.61	7.50	7.42	7.34	7.28	7.23	7.19	7.16	7.12	7.10	7.07	7.05	7.03	7.01
6	9.88	8.05	7.29	6.86	6.58	6.39	6.25	6.14	6.05	5.98	5.93	5.88	5.83	5.80	5.76	5.74	5.71	5.69	5.67	5.65
7	8.99	7.20	6.45	6.03	5.76	5.58	5.44	5.33	5.24	5.17	5.11	5.06	5.02	4.98	4.95	4.92	4.90	4.88	4.86	4.84
8	8.39	6.64	5.90	5.49	5.22	5.04	4.90	4.79	4.70	4.63	4.58	4.53	4.49	4.45	4.42	4.39	4.36	4.34	4.32	4.30
9	7.96	6.23	5.51	5.10	4.84	4.65	4.52	4.41	4.33	4.26	4.20	4.15	4.11	4.07	4.04	4.01	3.99	3.96	3.94	3.92
10	7.64	5.93	5.22	4.82	4.55	4.37	4.23	4.13	4.04	3.97	3.92	3.87	3.83	3.79	3.76	3.73	3.70	3.68	3.66	3.64
11	7.39	5.70	4.99	4.59	4.34	4.15	4.02	3.91	3.83	3.76	3.70	3.65	3.61	3.57	3.54	3.51	3.49	3.47	3.45	3.43
12	7.19	5.52	4.81	4.42	4.16	3.98	3.85	3.74	3.66	3.59	3.53	3.48	3.44	3.40	3.37	3.34	3.32	3.29	3.27	3.25
13	7.02	5.37	4.67	4.28	4.02	3.84	3.71	3.60	3.52	3.45	3.39	3.34	3.30	3.26	3.23	3.20	3.18	3.15	3.13	3.11
14	6.89	5.24	4.55	4.16	3.90	3.72	3.59	3.48	3.40	3.33	3.27	3.23	3.18	3.15	3.11	3.09	3.06	3.04	3.02	3.00
15	6.77	5.14	4.45	4.06	3.81	3.63	3.49	3.39	3.30	3.23	3.18	3.13	3.09	3.05	3.02	2.99	2.96	2.94	2.92	2.90
16	6.67	5.05	4.36	3.97	3.72	3.54	3.41	3.30	3.22	3.15	3.09	3.05	3.00	2.97	2.93	2.90	2.88	2.86	2.84	2.82
17	6.59	4.97	4.29	3.90	3.65	3.47	3.34	3.23	3.15	3.08	3.02	2.97	2.93	2.89	2.86	2.83	2.81	2.78	2.76	2.74
18	6.51	4.90	4.22	3.84	3.59	3.41	3.27	3.17	3.09	3.02	2.96	2.91	2.87	2.83	2.80	2.77	2.74	2.72	2.70	2.68
19	6.45	4.84	4.16	3.78	3.53	3.35	3.22	3.12	3.03	2.96	2.91	2.86	2.81	2.78	2.74	2.72	2.69	2.67	2.65	2.63
20	6.39	4.79	4.11	3.73	3.48	3.30	3.17	3.07	2.98	2.91	2.86	2.81	2.77	2.73	2.70	2.67	2.64	2.62	2.60	2.58
21	6.34	4.74	4.07	3.69	3.44	3.26	3.13	3.02	2.94	2.87	2.81	2.76	2.72	2.68	2.65	2.62	2.60	2.57	2.55	2.53
22	6.29	4.70	4.03	3.65	3.40	3.22	3.09	2.99	2.90	2.83	2.77	2.73	2.68	2.65	2.61	2.58	2.56	2.53	2.51	2.49
23	6.25	4.66	3.99	3.61	3.36	3.19	3.05	2.95	2.87	2.80	2.74	2.69	2.65	2.61	2.58	2.55	2.52	2.50	2.48	2.46
24	6.21	4.63	3.96	3.58	3.33	3.15	3.02	2.92	2.83	2.77	2.71	2.66	2.62	2.58	2.55	2.52	2.49	2.47	2.45	2.43
25	6.18	4.59	3.93	3.55	3.30	3.13	2.99	2.89	2.81	2.74	2.68	2.63	2.59	2.55	2.52	2.49	2.46	2.44	2.42	2.40
26	6.14	4.56	3.90	3.52	3.28	3.10	2.97	2.86	2.78	2.71	2.65	2.60	2.56	2.52	2.49	2.46	2.43	2.41	2.39	2.37
27	6.11	4.54	3.87	3.50	3.25	3.07	2.94	2.84	2.76	2.69	2.63	2.58	2.54	2.50	2.46	2.44	2.41	2.39	2.36	2.34
28	6.09	4.51	3.85	3.47	3.23	3.05	2.92	2.82	2.73	2.66	2.61	2.56	2.51	2.48	2.44	2.41	2.39	2.36	2.34	2.32
29	6.06	4.49	3.83	3.45	3.21	3.03	2.90	2.80	2.71	2.64	2.58	2.54	2.49	2.45	2.42	2.39	2.37	2.34	2.32	2.30
30	6.04	4.47	3.81	3.43	3.19	3.01	2.88	2.78	2.69	2.62	2.57	2.52	2.47	2.44	2.40	2.37	2.35	2.32	2.30	2.28

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$df_n \rightarrow$ $df_d \downarrow$	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
31	6.02	4.45	3.79	3.42	3.17	2.99	2.86	2.76	2.68	2.61	2.55	2.50	2.45	2.42	2.38	2.35	2.33	2.30	2.28	2.26
32	6.00	4.43	3.77	3.40	3.15	2.98	2.85	2.74	2.66	2.59	2.53	2.48	2.44	2.40	2.37	2.34	2.31	2.29	2.26	2.25
33	5.98	4.41	3.76	3.38	3.14	2.96	2.83	2.73	2.64	2.57	2.52	2.47	2.42	2.38	2.35	2.32	2.29	2.27	2.25	2.23
34	5.96	4.40	3.74	3.37	3.12	2.95	2.82	2.71	2.63	2.56	2.50	2.45	2.41	2.37	2.34	2.31	2.28	2.26	2.23	2.21
35	5.94	4.38	3.73	3.35	3.11	2.93	2.80	2.70	2.61	2.55	2.49	2.44	2.39	2.36	2.32	2.29	2.27	2.24	2.22	2.20
36	5.93	4.37	3.71	3.34	3.10	2.92	2.79	2.69	2.60	2.53	2.47	2.42	2.38	2.34	2.31	2.28	2.25	2.23	2.21	2.19
37	5.91	4.36	3.70	3.33	3.08	2.91	2.78	2.67	2.59	2.52	2.46	2.41	2.37	2.33	2.30	2.27	2.24	2.22	2.19	2.17
38	5.90	4.34	3.69	3.32	3.07	2.90	2.77	2.66	2.58	2.51	2.45	2.40	2.36	2.32	2.29	2.26	2.23	2.20	2.18	2.16
39	5.88	4.33	3.68	3.31	3.06	2.89	2.76	2.65	2.57	2.50	2.44	2.39	2.35	2.31	2.27	2.24	2.22	2.19	2.17	2.15
40	5.87	4.32	3.67	3.30	3.05	2.88	2.74	2.64	2.56	2.49	2.43	2.38	2.34	2.30	2.26	2.23	2.21	2.18	2.16	2.14
41	5.86	4.31	3.66	3.29	3.04	2.87	2.74	2.63	2.55	2.48	2.42	2.37	2.33	2.29	2.25	2.22	2.20	2.17	2.15	2.13
42	5.85	4.30	3.65	3.28	3.03	2.86	2.73	2.62	2.54	2.47	2.41	2.36	2.32	2.28	2.25	2.22	2.19	2.16	2.14	2.12
43	5.84	4.29	3.64	3.27	3.02	2.85	2.72	2.61	2.53	2.46	2.40	2.35	2.31	2.27	2.24	2.21	2.18	2.15	2.13	2.11
44	5.83	4.28	3.63	3.26	3.01	2.84	2.71	2.61	2.52	2.45	2.39	2.34	2.30	2.26	2.23	2.20	2.17	2.15	2.12	2.10
45	5.82	4.27	3.62	3.25	3.01	2.83	2.70	2.60	2.51	2.44	2.39	2.34	2.29	2.25	2.22	2.19	2.16	2.14	2.12	2.10
46	5.81	4.26	3.61	3.24	3.00	2.83	2.69	2.59	2.51	2.44	2.38	2.33	2.28	2.25	2.21	2.18	2.15	2.13	2.11	2.09
47	5.80	4.26	3.61	3.24	2.99	2.82	2.69	2.58	2.50	2.43	2.37	2.32	2.28	2.24	2.20	2.17	2.15	2.12	2.10	2.08
48	5.79	4.25	3.60	3.23	2.99	2.81	2.68	2.58	2.49	2.42	2.36	2.31	2.27	2.23	2.20	2.17	2.14	2.12	2.09	2.07
49	5.78	4.24	3.59	3.22	2.98	2.80	2.67	2.57	2.49	2.42	2.36	2.31	2.26	2.23	2.19	2.16	2.13	2.11	2.09	2.07
50	5.78	4.23	3.59	3.22	2.97	2.80	2.67	2.56	2.48	2.41	2.35	2.30	2.26	2.22	2.18	2.15	2.13	2.10	2.08	2.06
55	5.74	4.20	3.56	3.19	2.94	2.77	2.64	2.54	2.45	2.38	2.32	2.27	2.23	2.19	2.16	2.13	2.10	2.07	2.05	2.03
60	5.71	4.18	3.53	3.16	2.92	2.75	2.62	2.51	2.43	2.36	2.30	2.25	2.21	2.17	2.13	2.10	2.07	2.05	2.03	2.01
65	5.69	4.16	3.51	3.14	2.90	2.73	2.60	2.49	2.41	2.34	2.28	2.23	2.19	2.15	2.11	2.08	2.05	2.03	2.01	1.99
70	5.67	4.14	3.49	3.13	2.88	2.71	2.58	2.48	2.39	2.32	2.26	2.21	2.17	2.13	2.10	2.07	2.04	2.01	1.99	1.97
75	5.65	4.12	3.48	3.11	2.87	2.70	2.57	2.46	2.38	2.31	2.25	2.20	2.15	2.12	2.08	2.05	2.02	2.00	1.98	1.95
80	5.64	4.11	3.47	3.10	2.86	2.68	2.55	2.45	2.37	2.30	2.24	2.19	2.14	2.10	2.07	2.04	2.01	1.99	1.96	1.94
85	5.62	4.10	3.46	3.09	2.85	2.67	2.54	2.44	2.35	2.29	2.23	2.18	2.13	2.09	2.06	2.03	2.00	1.97	1.95	1.93
90	5.61	4.09	3.45	3.08	2.84	2.66	2.53	2.43	2.35	2.28	2.22	2.17	2.12	2.08	2.05	2.02	1.99	1.96	1.94	1.92
95	5.60	4.08	3.44	3.07	2.83	2.66	2.52	2.42	2.34	2.27	2.21	2.16	2.11	2.07	2.04	2.01	1.98	1.95	1.93	1.91
100	5.59	4.07	3.43	3.06	2.82	2.65	2.52	2.41	2.33	2.26	2.20	2.15	2.10	2.07	2.03	2.00	1.97	1.95	1.92	1.90
110	5.58	4.06	3.42	3.05	2.81	2.64	2.51	2.41	2.32	2.25	2.19	2.14	2.10	2.06	2.02	1.99	1.96	1.94	1.92	1.90
120	5.57	4.05	3.41	3.05	2.81	2.63	2.50	2.40	2.32	2.25	2.19	2.14	2.09	2.05	2.02	1.99	1.96	1.93	1.91	1.89

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Critical Values of F-Test at 2.5% Significance level $F_{0.025,(df_n,df_d)}$

$df_n \rightarrow$ $df_d \downarrow$	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	647.79	799.50	864.16	899.58	921.85	937.11	948.22	956.66	963.28	968.63	973.03	976.71	979.84	982.53	984.87	986.92	988.73	990.35	991.80	993.10
2	38.51	39.00	39.17	39.25	39.30	39.33	39.36	39.37	39.39	39.40	39.41	39.41	39.42	39.43	39.43	39.44	39.44	39.44	39.45	39.45
3	17.44	16.04	15.44	15.10	14.88	14.73	14.62	14.54	14.47	14.42	14.37	14.34	14.30	14.28	14.25	14.23	14.21	14.20	14.18	14.17
4	12.22	10.65	9.98	9.60	9.36	9.20	9.07	8.98	8.90	8.84	8.79	8.75	8.71	8.68	8.66	8.63	8.61	8.59	8.58	8.56
5	10.01	8.43	7.76	7.39	7.15	6.98	6.85	6.76	6.68	6.62	6.57	6.52	6.49	6.46	6.43	6.40	6.38	6.36	6.34	6.33
6	8.81	7.26	6.60	6.23	5.99	5.82	5.70	5.60	5.52	5.46	5.41	5.37	5.33	5.30	5.27	5.24	5.22	5.20	5.18	5.17
7	8.07	6.54	5.89	5.52	5.29	5.12	4.99	4.90	4.82	4.76	4.71	4.67	4.63	4.60	4.57	4.54	4.52	4.50	4.48	4.47
8	7.57	6.06	5.42	5.05	4.82	4.65	4.53	4.43	4.36	4.30	4.24	4.20	4.16	4.13	4.10	4.08	4.05	4.03	4.02	4.00
9	7.21	5.71	5.08	4.72	4.48	4.32	4.20	4.10	4.03	3.96	3.91	3.87	3.83	3.80	3.77	3.74	3.72	3.70	3.68	3.67
10	6.94	5.46	4.83	4.47	4.24	4.07	3.95	3.85	3.78	3.72	3.66	3.62	3.58	3.55	3.52	3.50	3.47	3.45	3.44	3.42
11	6.72	5.26	4.63	4.28	4.04	3.88	3.76	3.66	3.59	3.53	3.47	3.43	3.39	3.36	3.33	3.30	3.28	3.26	3.24	3.23
12	6.55	5.10	4.47	4.12	3.89	3.73	3.61	3.51	3.44	3.37	3.32	3.28	3.24	3.21	3.18	3.15	3.13	3.11	3.09	3.07
13	6.41	4.97	4.35	4.00	3.77	3.60	3.48	3.39	3.31	3.25	3.20	3.15	3.12	3.08	3.05	3.03	3.00	2.98	2.96	2.95
14	6.30	4.86	4.24	3.89	3.66	3.50	3.38	3.29	3.21	3.15	3.09	3.05	3.01	2.98	2.95	2.92	2.90	2.88	2.86	2.84
15	6.20	4.77	4.15	3.80	3.58	3.41	3.29	3.20	3.12	3.06	3.01	2.96	2.92	2.89	2.86	2.84	2.81	2.79	2.77	2.76
16	6.12	4.69	4.08	3.73	3.50	3.34	3.22	3.12	3.05	2.99	2.93	2.89	2.85	2.82	2.79	2.76	2.74	2.72	2.70	2.68
17	6.04	4.62	4.01	3.66	3.44	3.28	3.16	3.06	2.98	2.92	2.87	2.82	2.79	2.75	2.72	2.70	2.67	2.65	2.63	2.62
18	5.98	4.56	3.95	3.61	3.38	3.22	3.10	3.01	2.93	2.87	2.81	2.77	2.73	2.70	2.67	2.64	2.62	2.60	2.58	2.56
19	5.92	4.51	3.90	3.56	3.33	3.17	3.05	2.96	2.88	2.82	2.76	2.72	2.68	2.65	2.62	2.59	2.57	2.55	2.53	2.51
20	5.87	4.46	3.86	3.51	3.29	3.13	3.01	2.91	2.84	2.77	2.72	2.68	2.64	2.60	2.57	2.55	2.52	2.50	2.48	2.46
21	5.83	4.42	3.82	3.48	3.25	3.09	2.97	2.87	2.80	2.73	2.68	2.64	2.60	2.56	2.53	2.51	2.48	2.46	2.44	2.42
22	5.79	4.38	3.78	3.44	3.22	3.05	2.93	2.84	2.76	2.70	2.65	2.60	2.56	2.53	2.50	2.47	2.45	2.43	2.41	2.39
23	5.75	4.35	3.75	3.41	3.18	3.02	2.90	2.81	2.73	2.67	2.62	2.57	2.53	2.50	2.47	2.44	2.42	2.39	2.37	2.36
24	5.72	4.32	3.72	3.38	3.15	2.99	2.87	2.78	2.70	2.64	2.59	2.54	2.50	2.47	2.44	2.41	2.39	2.36	2.35	2.33
25	5.69	4.29	3.69	3.35	3.13	2.97	2.85	2.75	2.68	2.61	2.56	2.51	2.48	2.44	2.41	2.38	2.36	2.34	2.32	2.30
26	5.66	4.27	3.67	3.33	3.10	2.94	2.82	2.73	2.65	2.59	2.54	2.49	2.45	2.42	2.39	2.36	2.34	2.31	2.29	2.28
27	5.63	4.24	3.65	3.31	3.08	2.92	2.80	2.71	2.63	2.57	2.51	2.47	2.43	2.39	2.36	2.34	2.31	2.29	2.27	2.25
28	5.61	4.22	3.63	3.29	3.06	2.90	2.78	2.69	2.61	2.55	2.49	2.45	2.41	2.37	2.34	2.32	2.29	2.27	2.25	2.23
29	5.59	4.20	3.61	3.27	3.04	2.88	2.76	2.67	2.59	2.53	2.48	2.43	2.39	2.36	2.32	2.30	2.27	2.25	2.23	2.21
30	5.57	4.18	3.59	3.25	3.03	2.87	2.75	2.65	2.57	2.51	2.46	2.41	2.37	2.34	2.31	2.28	2.26	2.23	2.21	2.20

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Cell # 0323-5332733, 0332-5332733

$df_n \rightarrow$ $df_d \downarrow$	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
31	5.55	4.16	3.57	3.23	3.01	2.85	2.73	2.64	2.56	2.50	2.44	2.40	2.36	2.32	2.29	2.26	2.24	2.22	2.20	2.18
32	5.53	4.15	3.56	3.22	3.00	2.84	2.71	2.62	2.54	2.48	2.43	2.38	2.34	2.31	2.28	2.25	2.22	2.20	2.18	2.16
33	5.51	4.13	3.54	3.20	2.98	2.82	2.70	2.61	2.53	2.47	2.41	2.37	2.33	2.29	2.26	2.23	2.21	2.19	2.17	2.15
34	5.50	4.12	3.53	3.19	2.97	2.81	2.69	2.59	2.52	2.45	2.40	2.35	2.31	2.28	2.25	2.22	2.20	2.17	2.15	2.13
35	5.48	4.11	3.52	3.18	2.96	2.80	2.68	2.58	2.50	2.44	2.39	2.34	2.30	2.27	2.23	2.21	2.18	2.16	2.14	2.12
36	5.47	4.09	3.50	3.17	2.94	2.78	2.66	2.57	2.49	2.43	2.37	2.33	2.29	2.25	2.22	2.20	2.17	2.15	2.13	2.11
37	5.46	4.08	3.49	3.16	2.93	2.77	2.65	2.56	2.48	2.42	2.36	2.32	2.28	2.24	2.21	2.18	2.16	2.14	2.12	2.10
38	5.45	4.07	3.48	3.15	2.92	2.76	2.64	2.55	2.47	2.41	2.35	2.31	2.27	2.23	2.20	2.17	2.15	2.13	2.11	2.09
39	5.43	4.06	3.47	3.14	2.91	2.75	2.63	2.54	2.46	2.40	2.34	2.30	2.26	2.22	2.19	2.16	2.14	2.12	2.10	2.08
40	5.42	4.05	3.46	3.13	2.90	2.74	2.62	2.53	2.45	2.39	2.33	2.29	2.25	2.21	2.18	2.15	2.13	2.11	2.09	2.07
41	5.41	4.04	3.45	3.12	2.89	2.74	2.62	2.52	2.44	2.38	2.33	2.28	2.24	2.20	2.17	2.15	2.12	2.10	2.08	2.06
42	5.40	4.03	3.45	3.11	2.89	2.73	2.61	2.51	2.43	2.37	2.32	2.27	2.23	2.20	2.16	2.14	2.11	2.09	2.07	2.05
43	5.39	4.02	3.44	3.10	2.88	2.72	2.60	2.50	2.43	2.36	2.31	2.26	2.22	2.19	2.16	2.13	2.10	2.08	2.06	2.04
44	5.39	4.02	3.43	3.09	2.87	2.71	2.59	2.50	2.42	2.36	2.30	2.26	2.22	2.18	2.15	2.12	2.10	2.07	2.05	2.03
45	5.38	4.01	3.42	3.09	2.86	2.70	2.58	2.49	2.41	2.35	2.29	2.25	2.21	2.17	2.14	2.11	2.09	2.07	2.04	2.03
46	5.37	4.00	3.42	3.08	2.86	2.70	2.58	2.48	2.41	2.34	2.29	2.24	2.20	2.17	2.13	2.11	2.08	2.06	2.04	2.02
47	5.36	3.99	3.41	3.07	2.85	2.69	2.57	2.48	2.40	2.33	2.28	2.23	2.19	2.16	2.13	2.10	2.07	2.05	2.03	2.01
48	5.35	3.99	3.40	3.07	2.84	2.69	2.56	2.47	2.39	2.33	2.27	2.23	2.19	2.15	2.12	2.09	2.07	2.05	2.02	2.01
49	5.35	3.98	3.40	3.06	2.84	2.68	2.56	2.46	2.39	2.32	2.27	2.22	2.18	2.15	2.11	2.09	2.06	2.04	2.02	2.00
50	5.34	3.97	3.39	3.05	2.83	2.67	2.55	2.46	2.38	2.32	2.26	2.22	2.18	2.14	2.11	2.08	2.06	2.03	2.01	1.99
55	5.31	3.95	3.36	3.03	2.81	2.65	2.53	2.43	2.36	2.29	2.24	2.19	2.15	2.11	2.08	2.05	2.03	2.01	1.99	1.97
60	5.29	3.93	3.34	3.01	2.79	2.63	2.51	2.41	2.33	2.27	2.22	2.17	2.13	2.09	2.06	2.03	2.01	1.98	1.96	1.94
65	5.26	3.91	3.32	2.99	2.77	2.61	2.49	2.39	2.32	2.25	2.20	2.15	2.11	2.07	2.04	2.01	1.99	1.97	1.95	1.93
70	5.25	3.89	3.31	2.97	2.75	2.59	2.47	2.38	2.30	2.24	2.18	2.14	2.10	2.06	2.03	2.00	1.97	1.95	1.93	1.91
75	5.23	3.88	3.30	2.96	2.74	2.58	2.46	2.37	2.29	2.22	2.17	2.12	2.08	2.05	2.01	1.99	1.96	1.94	1.92	1.90
80	5.22	3.86	3.28	2.95	2.73	2.57	2.45	2.35	2.28	2.21	2.16	2.11	2.07	2.03	2.00	1.97	1.95	1.92	1.90	1.88
85	5.21	3.85	3.27	2.94	2.72	2.56	2.44	2.35	2.27	2.20	2.15	2.10	2.06	2.02	1.99	1.96	1.94	1.91	1.89	1.87
90	5.20	3.84	3.26	2.93	2.71	2.55	2.43	2.34	2.26	2.19	2.14	2.09	2.05	2.02	1.98	1.95	1.93	1.91	1.88	1.86
95	5.19	3.84	3.26	2.92	2.70	2.54	2.42	2.33	2.25	2.19	2.13	2.08	2.04	2.01	1.98	1.95	1.92	1.90	1.88	1.86
100	5.18	3.83	3.25	2.92	2.70	2.54	2.42	2.32	2.24	2.18	2.12	2.08	2.04	2.00	1.97	1.94	1.91	1.89	1.87	1.85
110	5.17	3.82	3.24	2.91	2.69	2.53	2.41	2.32	2.24	2.17	2.12	2.07	2.03	1.99	1.96	1.93	1.91	1.88	1.86	1.84
120	5.16	3.82	3.24	2.90	2.68	2.53	2.40	2.31	2.23	2.17	2.11	2.07	2.02	1.99	1.96	1.93	1.90	1.88	1.86	1.84

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Critical Values of F-Test at 5% Significance level $F_{0.05,(df_n,df_d)}$

$df_n \rightarrow$ $df_d \downarrow$	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	161.45	199.50	215.71	224.58	230.16	233.99	236.77	238.88	240.54	241.88	242.98	243.91	244.69	245.36	245.95	246.46	246.92	247.32	247.69	248.01
2	18.51	19.00	19.16	19.25	19.30	19.33	19.35	19.37	19.38	19.40	19.40	19.41	19.42	19.42	19.43	19.43	19.44	19.44	19.44	19.45
3	10.13	9.55	9.28	9.12	9.01	8.94	8.89	8.85	8.81	8.79	8.76	8.74	8.73	8.71	8.70	8.69	8.68	8.67	8.67	8.66
4	7.71	6.94	6.59	6.39	6.26	6.16	6.09	6.04	6.00	5.96	5.94	5.91	5.89	5.87	5.86	5.84	5.83	5.82	5.81	5.80
5	6.61	5.79	5.41	5.19	5.05	4.95	4.88	4.82	4.77	4.74	4.70	4.68	4.66	4.64	4.62	4.60	4.59	4.58	4.57	4.56
6	5.99	5.14	4.76	4.53	4.39	4.28	4.21	4.15	4.10	4.06	4.03	4.00	3.98	3.96	3.94	3.92	3.91	3.90	3.88	3.87
7	5.59	4.74	4.35	4.12	3.97	3.87	3.79	3.73	3.68	3.64	3.60	3.57	3.55	3.53	3.51	3.49	3.48	3.47	3.46	3.44
8	5.32	4.46	4.07	3.84	3.69	3.58	3.50	3.44	3.39	3.35	3.31	3.28	3.26	3.24	3.22	3.20	3.19	3.17	3.16	3.15
9	5.12	4.26	3.86	3.63	3.48	3.37	3.29	3.23	3.18	3.14	3.10	3.07	3.05	3.03	3.01	2.99	2.97	2.96	2.95	2.94
10	4.96	4.10	3.71	3.48	3.33	3.22	3.14	3.07	3.02	2.98	2.94	2.91	2.89	2.86	2.85	2.83	2.81	2.80	2.79	2.77
11	4.84	3.98	3.59	3.36	3.20	3.09	3.01	2.95	2.90	2.85	2.82	2.79	2.76	2.74	2.72	2.70	2.69	2.67	2.66	2.65
12	4.75	3.89	3.49	3.26	3.11	3.00	2.91	2.85	2.80	2.75	2.72	2.69	2.66	2.64	2.62	2.60	2.58	2.57	2.56	2.54
13	4.67	3.81	3.41	3.18	3.03	2.92	2.83	2.77	2.71	2.67	2.63	2.60	2.58	2.55	2.53	2.51	2.50	2.48	2.47	2.46
14	4.60	3.74	3.34	3.11	2.96	2.85	2.76	2.70	2.65	2.60	2.57	2.53	2.51	2.48	2.46	2.44	2.43	2.41	2.40	2.39
15	4.54	3.68	3.29	3.06	2.90	2.79	2.71	2.64	2.59	2.54	2.51	2.48	2.45	2.42	2.40	2.38	2.37	2.35	2.34	2.33
16	4.49	3.63	3.24	3.01	2.85	2.74	2.66	2.59	2.54	2.49	2.46	2.42	2.40	2.37	2.35	2.33	2.32	2.30	2.29	2.28
17	4.45	3.59	3.20	2.96	2.81	2.70	2.61	2.55	2.49	2.45	2.41	2.38	2.35	2.33	2.31	2.29	2.27	2.26	2.24	2.23
18	4.41	3.55	3.16	2.93	2.77	2.66	2.58	2.51	2.46	2.41	2.37	2.34	2.31	2.29	2.27	2.25	2.23	2.22	2.20	2.19
19	4.38	3.52	3.13	2.90	2.74	2.63	2.54	2.48	2.42	2.38	2.34	2.31	2.28	2.26	2.23	2.21	2.20	2.18	2.17	2.16
20	4.35	3.49	3.10	2.87	2.71	2.60	2.51	2.45	2.39	2.35	2.31	2.28	2.25	2.22	2.20	2.18	2.17	2.15	2.14	2.12
21	4.32	3.47	3.07	2.84	2.68	2.57	2.49	2.42	2.37	2.32	2.28	2.25	2.22	2.20	2.18	2.16	2.14	2.12	2.11	2.10
22	4.30	3.44	3.05	2.82	2.66	2.55	2.46	2.40	2.34	2.30	2.26	2.23	2.20	2.17	2.15	2.13	2.11	2.10	2.08	2.07
23	4.28	3.42	3.03	2.80	2.64	2.53	2.44	2.37	2.32	2.27	2.24	2.20	2.18	2.15	2.13	2.11	2.09	2.08	2.06	2.05
24	4.26	3.40	3.01	2.78	2.62	2.51	2.42	2.36	2.30	2.25	2.22	2.18	2.15	2.13	2.11	2.09	2.07	2.05	2.04	2.03
25	4.24	3.39	2.99	2.76	2.60	2.49	2.40	2.34	2.28	2.24	2.20	2.16	2.14	2.11	2.09	2.07	2.05	2.04	2.02	2.01
26	4.23	3.37	2.98	2.74	2.59	2.47	2.39	2.32	2.27	2.22	2.18	2.15	2.12	2.09	2.07	2.05	2.03	2.02	2.00	1.99
27	4.21	3.35	2.96	2.73	2.57	2.46	2.37	2.31	2.25	2.20	2.17	2.13	2.10	2.08	2.06	2.04	2.02	2.00	1.99	1.97
28	4.20	3.34	2.95	2.71	2.56	2.45	2.36	2.29	2.24	2.19	2.15	2.12	2.09	2.06	2.04	2.02	2.00	1.99	1.97	1.96
29	4.18	3.33	2.93	2.70	2.55	2.43	2.35	2.28	2.22	2.18	2.14	2.10	2.08	2.05	2.03	2.01	1.99	1.97	1.96	1.94
30	4.17	3.32	2.92	2.69	2.53	2.42	2.33	2.27	2.21	2.16	2.13	2.09	2.06	2.04	2.01	1.99	1.98	1.96	1.95	1.93

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$df_n \rightarrow$ $df_d \downarrow$	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
31	4.16	3.30	2.91	2.68	2.52	2.41	2.32	2.25	2.20	2.15	2.11	2.08	2.05	2.03	2.00	1.98	1.96	1.95	1.93	1.92
32	4.15	3.29	2.90	2.67	2.51	2.40	2.31	2.24	2.19	2.14	2.10	2.07	2.04	2.01	1.99	1.97	1.95	1.94	1.92	1.91
33	4.14	3.28	2.89	2.66	2.50	2.39	2.30	2.23	2.18	2.13	2.09	2.06	2.03	2.00	1.98	1.96	1.94	1.93	1.91	1.90
34	4.13	3.28	2.88	2.65	2.49	2.38	2.29	2.23	2.17	2.12	2.08	2.05	2.02	1.99	1.97	1.95	1.93	1.92	1.90	1.89
35	4.12	3.27	2.87	2.64	2.49	2.37	2.29	2.22	2.16	2.11	2.07	2.04	2.01	1.99	1.96	1.94	1.92	1.91	1.89	1.88
36	4.11	3.26	2.87	2.63	2.48	2.36	2.28	2.21	2.15	2.11	2.07	2.03	2.00	1.98	1.95	1.93	1.92	1.90	1.88	1.87
37	4.11	3.25	2.86	2.63	2.47	2.36	2.27	2.20	2.14	2.10	2.06	2.02	2.00	1.97	1.95	1.93	1.91	1.89	1.88	1.86
38	4.10	3.24	2.85	2.62	2.46	2.35	2.26	2.19	2.14	2.09	2.05	2.02	1.99	1.96	1.94	1.92	1.90	1.88	1.87	1.85
39	4.09	3.24	2.85	2.61	2.46	2.34	2.26	2.19	2.13	2.08	2.04	2.01	1.98	1.95	1.93	1.91	1.89	1.88	1.86	1.85
40	4.08	3.23	2.84	2.61	2.45	2.34	2.25	2.18	2.12	2.08	2.04	2.00	1.97	1.95	1.92	1.90	1.89	1.87	1.85	1.84
41	4.08	3.23	2.83	2.60	2.44	2.33	2.24	2.17	2.12	2.07	2.03	2.00	1.97	1.94	1.92	1.90	1.88	1.86	1.85	1.83
42	4.07	3.22	2.83	2.59	2.44	2.32	2.24	2.17	2.11	2.06	2.03	1.99	1.96	1.94	1.91	1.89	1.87	1.86	1.84	1.83
43	4.07	3.21	2.82	2.59	2.43	2.32	2.23	2.16	2.11	2.06	2.02	1.99	1.96	1.93	1.91	1.89	1.87	1.85	1.83	1.82
44	4.06	3.21	2.82	2.58	2.43	2.31	2.23	2.16	2.10	2.05	2.01	1.98	1.95	1.92	1.90	1.88	1.86	1.84	1.83	1.81
45	4.06	3.20	2.81	2.58	2.42	2.31	2.22	2.15	2.10	2.05	2.01	1.97	1.94	1.92	1.89	1.87	1.86	1.84	1.82	1.81
46	4.05	3.20	2.81	2.57	2.42	2.30	2.22	2.15	2.09	2.04	2.00	1.97	1.94	1.91	1.89	1.87	1.85	1.83	1.82	1.80
47	4.05	3.20	2.80	2.57	2.41	2.30	2.21	2.14	2.09	2.04	2.00	1.96	1.93	1.91	1.88	1.86	1.84	1.83	1.81	1.80
48	4.04	3.19	2.80	2.57	2.41	2.29	2.21	2.14	2.08	2.03	1.99	1.96	1.93	1.90	1.88	1.86	1.84	1.82	1.81	1.79
49	4.04	3.19	2.79	2.56	2.40	2.29	2.20	2.13	2.08	2.03	1.99	1.96	1.93	1.90	1.88	1.85	1.84	1.82	1.80	1.79
50	4.03	3.18	2.79	2.56	2.40	2.29	2.20	2.13	2.07	2.03	1.99	1.95	1.92	1.89	1.87	1.85	1.83	1.81	1.80	1.78
55	4.02	3.16	2.77	2.54	2.38	2.27	2.18	2.11	2.06	2.01	1.97	1.93	1.90	1.88	1.85	1.83	1.81	1.79	1.78	1.76
60	4.00	3.15	2.76	2.53	2.37	2.25	2.17	2.10	2.04	1.99	1.95	1.92	1.89	1.86	1.84	1.82	1.80	1.78	1.76	1.75
65	3.99	3.14	2.75	2.51	2.36	2.24	2.15	2.08	2.03	1.98	1.94	1.90	1.87	1.85	1.82	1.80	1.78	1.76	1.75	1.73
70	3.98	3.13	2.74	2.50	2.35	2.23	2.14	2.07	2.02	1.97	1.93	1.89	1.86	1.84	1.81	1.79	1.77	1.75	1.74	1.72
75	3.97	3.12	2.73	2.49	2.34	2.22	2.13	2.06	2.01	1.96	1.92	1.88	1.85	1.83	1.80	1.78	1.76	1.74	1.73	1.71
80	3.96	3.11	2.72	2.49	2.33	2.21	2.13	2.06	2.00	1.95	1.91	1.88	1.84	1.82	1.79	1.77	1.75	1.73	1.72	1.70
85	3.95	3.10	2.71	2.48	2.32	2.21	2.12	2.05	1.99	1.94	1.90	1.87	1.84	1.81	1.79	1.76	1.74	1.73	1.71	1.70
90	3.95	3.10	2.71	2.47	2.32	2.20	2.11	2.04	1.99	1.94	1.90	1.86	1.83	1.80	1.78	1.76	1.74	1.72	1.70	1.69
95	3.94	3.09	2.70	2.47	2.31	2.20	2.11	2.04	1.98	1.93	1.89	1.86	1.82	1.80	1.77	1.75	1.73	1.71	1.70	1.68
100	3.94	3.09	2.70	2.46	2.31	2.19	2.10	2.03	1.97	1.93	1.89	1.85	1.82	1.79	1.77	1.75	1.73	1.71	1.69	1.68
110	3.93	3.08	2.69	2.45	2.30	2.18	2.09	2.02	1.97	1.92	1.88	1.84	1.81	1.78	1.76	1.74	1.72	1.70	1.68	1.67
120	3.92	3.07	2.68	2.45	2.29	2.18	2.09	2.02	1.96	1.91	1.87	1.83	1.80	1.78	1.75	1.73	1.71	1.69	1.67	1.66

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Critical Values of F-Test at 10% Significance level $F_{0.10,(df_n,df_d)}$

$df_n \rightarrow$ $df_d \downarrow$	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	39.86	49.50	53.59	55.83	57.24	58.20	58.91	59.44	59.86	60.19	60.47	60.71	60.90	61.07	61.22	61.35	61.46	61.57	61.66	61.74
2	8.53	9.00	9.16	9.24	9.29	9.33	9.35	9.37	9.38	9.39	9.40	9.41	9.41	9.42	9.42	9.43	9.43	9.44	9.44	9.44
3	5.54	5.46	5.39	5.34	5.31	5.28	5.27	5.25	5.24	5.23	5.22	5.22	5.21	5.20	5.20	5.20	5.19	5.19	5.19	5.18
4	4.54	4.32	4.19	4.11	4.05	4.01	3.98	3.95	3.94	3.92	3.91	3.90	3.89	3.88	3.87	3.86	3.86	3.85	3.85	3.84
5	4.06	3.78	3.62	3.52	3.45	3.40	3.37	3.34	3.32	3.30	3.28	3.27	3.26	3.25	3.24	3.23	3.22	3.22	3.21	3.21
6	3.78	3.46	3.29	3.18	3.11	3.05	3.01	2.98	2.96	2.94	2.92	2.90	2.89	2.88	2.87	2.86	2.85	2.85	2.84	2.84
7	3.59	3.26	3.07	2.96	2.88	2.83	2.78	2.75	2.72	2.70	2.68	2.67	2.65	2.64	2.63	2.62	2.61	2.61	2.60	2.59
8	3.46	3.11	2.92	2.81	2.73	2.67	2.62	2.59	2.56	2.54	2.52	2.50	2.49	2.48	2.46	2.45	2.45	2.44	2.43	2.42
9	3.36	3.01	2.81	2.69	2.61	2.55	2.51	2.47	2.44	2.42	2.40	2.38	2.36	2.35	2.34	2.33	2.32	2.31	2.30	2.30
10	3.29	2.92	2.73	2.61	2.52	2.46	2.41	2.38	2.35	2.32	2.30	2.28	2.27	2.26	2.24	2.23	2.22	2.22	2.21	2.20
11	3.23	2.86	2.66	2.54	2.45	2.39	2.34	2.30	2.27	2.25	2.23	2.21	2.19	2.18	2.17	2.16	2.15	2.14	2.13	2.12
12	3.18	2.81	2.61	2.48	2.39	2.33	2.28	2.24	2.21	2.19	2.17	2.15	2.13	2.12	2.10	2.09	2.08	2.08	2.07	2.06
13	3.14	2.76	2.56	2.43	2.35	2.28	2.23	2.20	2.16	2.14	2.12	2.10	2.08	2.07	2.05	2.04	2.03	2.02	2.01	2.01
14	3.10	2.73	2.52	2.39	2.31	2.24	2.19	2.15	2.12	2.10	2.07	2.05	2.04	2.02	2.01	2.00	1.99	1.98	1.97	1.96
15	3.07	2.70	2.49	2.36	2.27	2.21	2.16	2.12	2.09	2.06	2.04	2.02	2.00	1.99	1.97	1.96	1.95	1.94	1.93	1.92
16	3.05	2.67	2.46	2.33	2.24	2.18	2.13	2.09	2.06	2.03	2.01	1.99	1.97	1.95	1.94	1.93	1.92	1.91	1.90	1.89
17	3.03	2.64	2.44	2.31	2.22	2.15	2.10	2.06	2.03	2.00	1.98	1.96	1.94	1.93	1.91	1.90	1.89	1.88	1.87	1.86
18	3.01	2.62	2.42	2.29	2.20	2.13	2.08	2.04	2.00	1.98	1.95	1.93	1.92	1.90	1.89	1.87	1.86	1.85	1.84	1.84
19	2.99	2.61	2.40	2.27	2.18	2.11	2.06	2.02	1.98	1.96	1.93	1.91	1.89	1.88	1.86	1.85	1.84	1.83	1.82	1.81
20	2.97	2.59	2.38	2.25	2.16	2.09	2.04	2.00	1.96	1.94	1.91	1.89	1.87	1.86	1.84	1.83	1.82	1.81	1.80	1.79
21	2.96	2.57	2.36	2.23	2.14	2.08	2.02	1.98	1.95	1.92	1.90	1.87	1.86	1.84	1.83	1.81	1.80	1.79	1.78	1.78
22	2.95	2.56	2.35	2.22	2.13	2.06	2.01	1.97	1.93	1.90	1.88	1.86	1.84	1.83	1.81	1.80	1.79	1.78	1.77	1.76
23	2.94	2.55	2.34	2.21	2.11	2.05	1.99	1.95	1.92	1.89	1.87	1.84	1.83	1.81	1.80	1.78	1.77	1.76	1.75	1.74
24	2.93	2.54	2.33	2.19	2.10	2.04	1.98	1.94	1.91	1.88	1.85	1.83	1.81	1.80	1.78	1.77	1.76	1.75	1.74	1.73
25	2.92	2.53	2.32	2.18	2.09	2.02	1.97	1.93	1.89	1.87	1.84	1.82	1.80	1.79	1.77	1.76	1.75	1.74	1.73	1.72
26	2.91	2.52	2.31	2.17	2.08	2.01	1.96	1.92	1.88	1.86	1.83	1.81	1.79	1.77	1.76	1.75	1.73	1.72	1.71	1.71
27	2.90	2.51	2.30	2.17	2.07	2.00	1.95	1.91	1.87	1.85	1.82	1.80	1.78	1.76	1.75	1.74	1.72	1.71	1.70	1.70
28	2.89	2.50	2.29	2.16	2.06	2.00	1.94	1.90	1.87	1.84	1.81	1.79	1.77	1.75	1.74	1.73	1.71	1.70	1.69	1.69
29	2.89	2.50	2.28	2.15	2.06	1.99	1.93	1.89	1.86	1.83	1.80	1.78	1.76	1.75	1.73	1.72	1.71	1.69	1.68	1.68
30	2.88	2.49	2.28	2.14	2.05	1.98	1.93	1.88	1.85	1.82	1.79	1.77	1.75	1.74	1.72	1.71	1.70	1.69	1.68	1.67

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$df_n \rightarrow$ $df_d \downarrow$	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
31	2.87	2.48	2.27	2.14	2.04	1.97	1.92	1.88	1.84	1.81	1.79	1.77	1.75	1.73	1.71	1.70	1.69	1.68	1.67	1.66
32	2.87	2.48	2.26	2.13	2.04	1.97	1.91	1.87	1.83	1.81	1.78	1.76	1.74	1.72	1.71	1.69	1.68	1.67	1.66	1.65
33	2.86	2.47	2.26	2.12	2.03	1.96	1.91	1.86	1.83	1.80	1.77	1.75	1.73	1.72	1.70	1.69	1.67	1.66	1.65	1.64
34	2.86	2.47	2.25	2.12	2.02	1.96	1.90	1.86	1.82	1.79	1.77	1.75	1.73	1.71	1.69	1.68	1.67	1.66	1.65	1.64
35	2.85	2.46	2.25	2.11	2.02	1.95	1.90	1.85	1.82	1.79	1.76	1.74	1.72	1.70	1.69	1.67	1.66	1.65	1.64	1.63
36	2.85	2.46	2.24	2.11	2.01	1.94	1.89	1.85	1.81	1.78	1.76	1.73	1.71	1.70	1.68	1.67	1.66	1.65	1.64	1.63
37	2.85	2.45	2.24	2.10	2.01	1.94	1.89	1.84	1.81	1.78	1.75	1.73	1.71	1.69	1.68	1.66	1.65	1.64	1.63	1.62
38	2.84	2.45	2.23	2.10	2.01	1.94	1.88	1.84	1.80	1.77	1.75	1.72	1.70	1.69	1.67	1.66	1.65	1.63	1.62	1.61
39	2.84	2.44	2.23	2.09	2.00	1.93	1.88	1.83	1.80	1.77	1.74	1.72	1.70	1.68	1.67	1.65	1.64	1.63	1.62	1.61
40	2.84	2.44	2.23	2.09	2.00	1.93	1.87	1.83	1.79	1.76	1.74	1.71	1.70	1.68	1.66	1.65	1.64	1.62	1.61	1.61
41	2.83	2.44	2.22	2.09	1.99	1.92	1.87	1.82	1.79	1.76	1.73	1.71	1.69	1.67	1.66	1.64	1.63	1.62	1.61	1.60
42	2.83	2.43	2.22	2.08	1.99	1.92	1.86	1.82	1.78	1.75	1.73	1.71	1.69	1.67	1.65	1.64	1.63	1.62	1.61	1.60
43	2.83	2.43	2.22	2.08	1.99	1.92	1.86	1.82	1.78	1.75	1.72	1.70	1.68	1.67	1.65	1.64	1.62	1.61	1.60	1.59
44	2.82	2.43	2.21	2.08	1.98	1.91	1.86	1.81	1.78	1.75	1.72	1.70	1.68	1.66	1.65	1.63	1.62	1.61	1.60	1.59
45	2.82	2.42	2.21	2.07	1.98	1.91	1.85	1.81	1.77	1.74	1.72	1.70	1.68	1.66	1.64	1.63	1.62	1.60	1.59	1.58
46	2.82	2.42	2.21	2.07	1.98	1.91	1.85	1.81	1.77	1.74	1.71	1.69	1.67	1.65	1.64	1.63	1.61	1.60	1.59	1.58
47	2.82	2.42	2.20	2.07	1.97	1.90	1.85	1.80	1.77	1.74	1.71	1.69	1.67	1.65	1.64	1.62	1.61	1.60	1.59	1.58
48	2.81	2.42	2.20	2.07	1.97	1.90	1.85	1.80	1.77	1.73	1.71	1.69	1.67	1.65	1.63	1.62	1.61	1.59	1.58	1.57
49	2.81	2.41	2.20	2.06	1.97	1.90	1.84	1.80	1.76	1.73	1.71	1.68	1.66	1.65	1.63	1.62	1.60	1.59	1.58	1.57
50	2.81	2.41	2.20	2.06	1.97	1.90	1.84	1.80	1.76	1.73	1.70	1.68	1.66	1.64	1.63	1.61	1.60	1.59	1.58	1.57
55	2.80	2.40	2.19	2.05	1.95	1.88	1.83	1.78	1.75	1.72	1.69	1.67	1.65	1.63	1.61	1.60	1.59	1.58	1.56	1.55
60	2.79	2.39	2.18	2.04	1.95	1.87	1.82	1.77	1.74	1.71	1.68	1.66	1.64	1.62	1.60	1.59	1.58	1.56	1.55	1.54
65	2.78	2.39	2.17	2.03	1.94	1.87	1.81	1.77	1.73	1.70	1.67	1.65	1.63	1.61	1.59	1.58	1.57	1.55	1.54	1.53
70	2.78	2.38	2.16	2.03	1.93	1.86	1.80	1.76	1.72	1.69	1.66	1.64	1.62	1.60	1.59	1.57	1.56	1.55	1.54	1.53
75	2.77	2.37	2.16	2.02	1.93	1.85	1.80	1.75	1.72	1.69	1.66	1.63	1.61	1.60	1.58	1.57	1.55	1.54	1.53	1.52
80	2.77	2.37	2.15	2.02	1.92	1.85	1.79	1.75	1.71	1.68	1.65	1.63	1.61	1.59	1.57	1.56	1.55	1.53	1.52	1.51
85	2.77	2.37	2.15	2.01	1.92	1.84	1.79	1.74	1.71	1.67	1.65	1.62	1.60	1.59	1.57	1.55	1.54	1.53	1.52	1.51
90	2.76	2.36	2.15	2.01	1.91	1.84	1.78	1.74	1.70	1.67	1.64	1.62	1.60	1.58	1.56	1.55	1.54	1.52	1.51	1.50
95	2.76	2.36	2.14	2.00	1.91	1.84	1.78	1.74	1.70	1.67	1.64	1.62	1.60	1.58	1.56	1.55	1.53	1.52	1.51	1.50
100	2.76	2.36	2.14	2.00	1.91	1.83	1.78	1.73	1.69	1.66	1.64	1.61	1.59	1.57	1.56	1.54	1.53	1.52	1.50	1.49
110	2.75	2.35	2.14	2.00	1.90	1.83	1.77	1.73	1.69	1.66	1.63	1.61	1.59	1.57	1.55	1.54	1.52	1.51	1.50	1.49
120	2.75	2.35	2.13	2.00	1.90	1.83	1.77	1.73	1.69	1.66	1.63	1.61	1.59	1.57	1.55	1.54	1.52	1.51	1.50	1.49

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