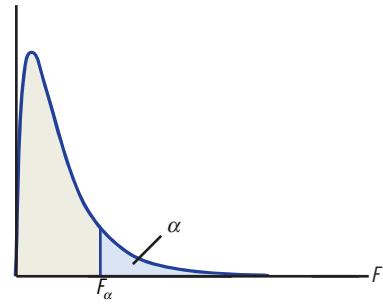


Critical Values of the F -Distribution ($\alpha = 0.005$)

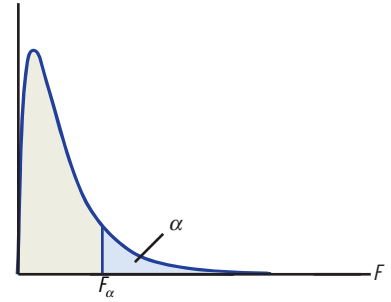


Numerator Degrees of Freedom

Denominator Degrees of Freedom

	1	2	3	4	5	6	7	8	9
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	199.2997	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	6.5410	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
∞	7.8794	5.2983	4.2794	3.7151	3.3499	3.0913	2.8968	2.7444	2.6210

Critical Values of the F -Distribution ($\alpha = 0.005$) (continued)

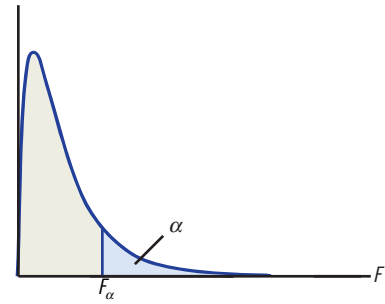


Numerator Degrees of Freedom

	10	11	12	13	14	15	16	17	18
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	3.5371	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
∞	2.5188	2.4324	2.3583	2.2938	2.2371	2.1868	2.1417	2.1011	2.0642

Denominator Degrees of Freedom

Critical Values of the F -Distribution ($\alpha = 0.005$) (continued)



Numerator Degrees of Freedom

	19	20	24	30	40	60	120
1	24803.3549	24835.9709	24939.5653	25043.6277	25148.1532	25253.1369	25358.5734
2	199.4470	199.4496	199.4579	199.4663	199.4746	199.4829	199.4912
3	42.8263	42.7775	42.6222	42.4658	42.3082	42.1494	41.9895
4	20.2104	20.1673	20.0300	19.8915	19.7518	19.6107	19.4684
5	12.9422	12.9035	12.7802	12.6556	12.5297	12.4024	12.2737
6	9.6247	9.5888	9.4742	9.3582	9.2408	9.1219	9.0015
7	7.7881	7.7540	7.6450	7.5345	7.4224	7.3088	7.1933
8	6.6411	6.6082	6.5029	6.3961	6.2875	6.1772	6.0649
9	5.8639	5.8318	5.7292	5.6248	5.5186	5.4104	5.3001
10	5.3055	5.2740	5.1732	5.0706	4.9659	4.8592	4.7501
11	4.8863	4.8552	4.7557	4.6543	4.5508	4.4450	4.3367
12	4.5606	4.5299	4.4314	4.3309	4.2282	4.1229	4.0149
13	4.3008	4.2703	4.1726	4.0727	3.9704	3.8655	3.7577
14	4.0888	4.0585	3.9614	3.8619	3.7600	3.6552	3.5473
15	3.9127	3.8826	3.7859	3.6867	3.5850	3.4803	3.3722
16	3.7641	3.7342	3.6378	3.5389	3.4372	3.3324	3.2240
17	3.6372	3.6073	3.5112	3.4124	3.3108	3.2058	3.0971
18	3.5275	3.4977	3.4017	3.3030	3.2014	3.0962	2.9871
19	3.4318	3.4020	3.3062	3.2075	3.1058	3.0004	2.8908
20	3.3475	3.3178	3.2220	3.1234	3.0215	2.9159	2.8058
21	3.2728	3.2431	3.1474	3.0488	2.9467	2.8408	2.7302
22	3.2060	3.1764	3.0807	2.9821	2.8799	2.7736	2.6625
23	3.1461	3.1165	3.0208	2.9221	2.8197	2.7132	2.6015
24	3.0920	3.0624	2.9667	2.8679	2.7654	2.6585	2.5463
25	3.0429	3.0133	2.9176	2.8187	2.7160	2.6088	2.4961
26	2.9981	2.9685	2.8728	2.7738	2.6709	2.5633	2.4501
27	2.9571	2.9275	2.8318	2.7327	2.6296	2.5217	2.4079
28	2.9194	2.8899	2.7941	2.6949	2.5916	2.4834	2.3690
29	2.8847	2.8551	2.7594	2.6600	2.5565	2.4479	2.3331
30	2.8526	2.8230	2.7272	2.6278	2.5241	2.4151	2.2998
40	2.6281	2.5984	2.5020	2.4015	2.2958	2.1838	2.0636
60	2.4171	2.3872	2.2898	2.1874	2.0789	1.9622	1.8341
120	2.2183	2.1881	2.0890	1.9840	1.8709	1.7469	1.6055
∞	2.0306	1.9998	1.8983	1.7891	1.6691	1.5325	1.3637

Denominator Degrees of Freedom