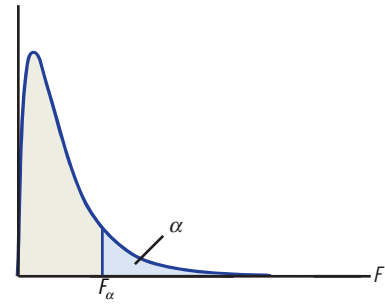


# Critical Values of the $F$ -Distribution ( $\alpha = 0.100$ )

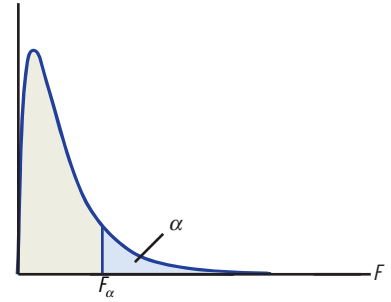


## Numerator Degrees of Freedom

Denominator Degrees of Freedom

	1	2	3	4	5	6	7	8	9
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	2.0910	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
$\infty$	2.7055	2.3026	2.0838	1.9449	1.8473	1.7741	1.7167	1.6702	1.6315

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

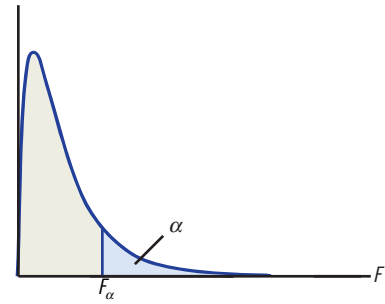


## Numerator Degrees of Freedom

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

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

(continued)



## Numerator Degrees of Freedom

Denominator Degrees of Freedom

	19	20	24	30	40	60	120
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