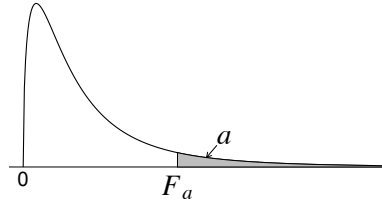# Critical Values of the F Distribution

A table entry is the value of F_a, having an area to the right of a under an F distribution with $df1$ degrees of freedom in the numerator, and $df2$ degrees of freedom in the denominator.

$df2$	a	Numerator degrees of freedom ($df1$)								
		1	2	3	4	5	6	7	8	9
1	0.100	39.86	49.50	53.59	55.83	57.24	58.20	58.91	59.44	59.86
1	0.050	161.45	199.50	215.71	224.58	230.16	233.99	236.77	238.88	240.54
1	0.025	647.79	799.50	864.16	899.58	921.85	937.11	948.22	956.66	963.28
1	0.010	4052.18	4999.50	5403.35	5624.58	5763.65	5858.99	5928.36	5981.07	6022.47
1	0.001	405284	500000	540379	562500	576405	585937	592873	598144	602284
2	0.100	8.53	9.00	9.16	9.24	9.29	9.33	9.35	9.37	9.38
2	0.050	18.51	19.00	19.16	19.25	19.30	19.33	19.35	19.37	19.38
2	0.025	38.51	39.00	39.17	39.25	39.30	39.33	39.36	39.37	39.39
2	0.010	98.50	99.00	99.17	99.25	99.30	99.33	99.36	99.37	99.39
2	0.001	998.50	999.00	999.17	999.25	999.30	999.33	999.36	999.37	999.39
3	0.100	5.54	5.46	5.39	5.34	5.31	5.28	5.27	5.25	5.24
3	0.050	10.13	9.55	9.28	9.12	9.01	8.94	8.89	8.85	8.81
3	0.025	17.44	16.04	15.44	15.10	14.88	14.73	14.62	14.54	14.47
3	0.010	34.12	30.82	29.46	28.71	28.24	27.91	27.67	27.49	27.35
3	0.001	167.03	148.50	141.11	137.10	134.58	132.85	131.58	130.62	129.86
4	0.100	4.54	4.32	4.19	4.11	4.05	4.01	3.98	3.95	3.94
4	0.050	7.71	6.94	6.59	6.39	6.26	6.16	6.09	6.04	6.00
4	0.025	12.22	10.65	9.98	9.60	9.36	9.20	9.07	8.98	8.90
4	0.010	21.20	18.00	16.69	15.98	15.52	15.21	14.98	14.80	14.66
4	0.001	74.14	61.25	56.18	53.44	51.71	50.53	49.66	49.00	48.47
5	0.100	4.06	3.78	3.62	3.52	3.45	3.40	3.37	3.34	3.32
5	0.050	6.61	5.79	5.41	5.19	5.05	4.95	4.88	4.82	4.77
5	0.025	10.01	8.43	7.76	7.39	7.15	6.98	6.85	6.76	6.68
5	0.010	16.26	13.27	12.06	11.39	10.97	10.67	10.46	10.29	10.16
5	0.001	47.18	37.12	33.20	31.09	29.75	28.83	28.16	27.65	27.24
6	0.100	3.78	3.46	3.29	3.18	3.11	3.05	3.01	2.98	2.96
6	0.050	5.99	5.14	4.76	4.53	4.39	4.28	4.21	4.15	4.10
6	0.025	8.81	7.26	6.60	6.23	5.99	5.82	5.70	5.60	5.52
6	0.010	13.75	10.92	9.78	9.15	8.75	8.47	8.26	8.10	7.98
6	0.001	35.51	27.00	23.70	21.92	20.80	20.03	19.46	19.03	18.69
7	0.100	3.59	3.26	3.07	2.96	2.88	2.83	2.78	2.75	2.72
7	0.050	5.59	4.74	4.35	4.12	3.97	3.87	3.79	3.73	3.68
7	0.025	8.07	6.54	5.89	5.52	5.29	5.12	4.99	4.90	4.82
7	0.010	12.25	9.55	8.45	7.85	7.46	7.19	6.99	6.84	6.72
7	0.001	29.25	21.69	18.77	17.20	16.21	15.52	15.02	14.63	14.33
8	0.100	3.46	3.11	2.92	2.81	2.73	2.67	2.62	2.59	2.56
8	0.050	5.32	4.46	4.07	3.84	3.69	3.58	3.50	3.44	3.39
8	0.025	7.57	6.06	5.42	5.05	4.82	4.65	4.53	4.43	4.36
8	0.010	11.26	8.65	7.59	7.01	6.63	6.37	6.18	6.03	5.91
8	0.001	25.41	18.49	15.83	14.39	13.48	12.86	12.40	12.05	11.77
9	0.100	3.36	3.01	2.81	2.69	2.61	2.55	2.51	2.47	2.44
9	0.050	5.12	4.26	3.86	3.63	3.48	3.37	3.29	3.23	3.18
9	0.025	7.21	5.71	5.08	4.72	4.48	4.32	4.20	4.10	4.03
9	0.010	10.56	8.02	6.99	6.42	6.06	5.80	5.61	5.47	5.35
9	0.001	22.86	16.39	13.90	12.56	11.71	11.13	10.70	10.37	10.11

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Critical Values of the F Distribution

A table entry is the value of F_a, having an area to the right of a under an F distribution with $df1$ degrees of freedom in the numerator, and $df2$ degrees of freedom in the denominator.
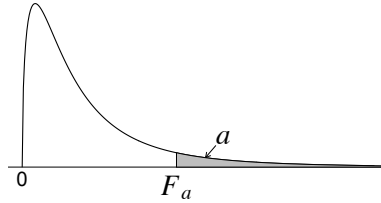
$df2$	a	10	12	15	20	25	30	50	100	1000
						Numerator degrees of freedom ($df1$)				
1	0.100	60.19	60.71	61.22	61.74	62.05	62.26	62.69	63.01	63.30
1	0.050	241.88	243.91	245.95	248.01	249.26	250.10	251.77	253.04	254.19
1	0.025	968.63	976.71	984.87	993.10	998.08	1001.41	1008.12	1013.17	1017.75
1	0.010	6055.85	6106.32	6157.28	6208.73	6239.83	6260.65	6302.52	6334.11	6362.68
1	0.001	605621	610668	615764	620908	624017	626099	630285	633444	636301
2	0.100	9.39	9.41	9.42	9.44	9.45	9.46	9.47	9.48	9.49
2	0.050	19.40	19.41	19.43	19.45	19.46	19.46	19.48	19.49	19.49
2	0.025	39.40	39.41	39.43	39.45	39.46	39.46	39.48	39.49	39.50
2	0.010	99.40	99.42	99.43	99.45	99.46	99.47	99.48	99.49	99.50
2	0.001	999.40	999.42	999.43	999.45	999.46	999.47	999.48	999.49	999.50
3	0.100	5.23	5.22	5.20	5.18	5.17	5.17	5.15	5.14	5.13
3	0.050	8.79	8.74	8.70	8.66	8.63	8.62	8.58	8.55	8.53
3	0.025	14.42	14.34	14.25	14.17	14.12	14.08	14.01	13.96	13.91
3	0.010	27.23	27.05	26.87	26.69	26.58	26.50	26.35	26.24	26.14
3	0.001	129.25	128.32	127.37	126.42	125.84	125.45	124.66	124.07	123.53
4	0.100	3.92	3.90	3.87	3.84	3.83	3.82	3.80	3.78	3.76
4	0.050	5.96	5.91	5.86	5.80	5.77	5.75	5.70	5.66	5.63
4	0.025	8.84	8.75	8.66	8.56	8.50	8.46	8.38	8.32	8.26
4	0.010	14.55	14.37	14.20	14.02	13.91	13.84	13.69	13.58	13.47
4	0.001	48.05	47.41	46.76	46.10	45.70	45.43	44.88	44.47	44.09
5	0.100	3.30	3.27	3.24	3.21	3.19	3.17	3.15	3.13	3.11
5	0.050	4.74	4.68	4.62	4.56	4.52	4.50	4.44	4.41	4.37
5	0.025	6.62	6.52	6.43	6.33	6.27	6.23	6.14	6.08	6.02
5	0.010	10.05	9.89	9.72	9.55	9.45	9.38	9.24	9.13	9.03
5	0.001	26.92	26.42	25.91	25.39	25.08	24.87	24.44	24.12	23.82
6	0.100	2.94	2.90	2.87	2.84	2.81	2.80	2.77	2.75	2.72
6	0.050	4.06	4.00	3.94	3.87	3.83	3.81	3.75	3.71	3.67
6	0.025	5.46	5.37	5.27	5.17	5.11	5.07	4.98	4.92	4.86
6	0.010	7.87	7.72	7.56	7.40	7.30	7.23	7.09	6.99	6.89
6	0.001	18.41	17.99	17.56	17.12	16.85	16.67	16.31	16.03	15.77
7	0.100	2.70	2.67	2.63	2.59	2.57	2.56	2.52	2.50	2.47
7	0.050	3.64	3.57	3.51	3.44	3.40	3.38	3.32	3.27	3.23
7	0.025	4.76	4.67	4.57	4.47	4.40	4.36	4.28	4.21	4.15
7	0.010	6.62	6.47	6.31	6.16	6.06	5.99	5.86	5.75	5.66
7	0.001	14.08	13.71	13.32	12.93	12.69	12.53	12.20	11.95	11.72
8	0.100	2.54	2.50	2.46	2.42	2.40	2.38	2.35	2.32	2.30
8	0.050	3.35	3.28	3.22	3.15	3.11	3.08	3.02	2.97	2.93
8	0.025	4.30	4.20	4.10	4.00	3.94	3.89	3.81	3.74	3.68
8	0.010	5.81	5.67	5.52	5.36	5.26	5.20	5.07	4.96	4.87
8	0.001	11.54	11.19	10.84	10.48	10.26	10.11	9.80	9.57	9.36
9	0.100	2.42	2.38	2.34	2.30	2.27	2.25	2.22	2.19	2.16
9	0.050	3.14	3.07	3.01	2.94	2.89	2.86	2.80	2.76	2.71
9	0.025	3.96	3.87	3.77	3.67	3.60	3.56	3.47	3.40	3.34
9	0.010	5.26	5.11	4.96	4.81	4.71	4.65	4.52	4.41	4.32
9	0.001	9.89	9.57	9.24	8.90	8.69	8.55	8.26	8.04	7.84

Created by Jeremy Balka using the statistical software R

Critical Values of the F Distribution

A table entry is the value of F_a, having an area to the right of a under an F distribution with $df1$ degrees of freedom in the numerator, and $df2$ degrees of freedom in the denominator.
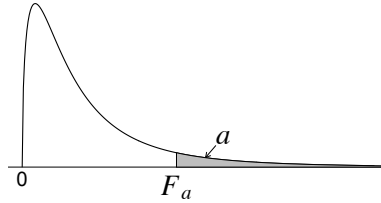
$df2$	a	Numerator degrees of freedom ($df1$)								
		1	2	3	4	5	6	7	8	9
10	0.100	3.29	2.92	2.73	2.61	2.52	2.46	2.41	2.38	2.35
10	0.050	4.96	4.10	3.71	3.48	3.33	3.22	3.14	3.07	3.02
10	0.025	6.94	5.46	4.83	4.47	4.24	4.07	3.95	3.85	3.78
10	0.010	10.04	7.56	6.55	5.99	5.64	5.39	5.20	5.06	4.94
10	0.001	21.04	14.91	12.55	11.28	10.48	9.93	9.52	9.20	8.96
11	0.100	3.23	2.86	2.66	2.54	2.45	2.39	2.34	2.30	2.27
11	0.050	4.84	3.98	3.59	3.36	3.20	3.09	3.01	2.95	2.90
11	0.025	6.72	5.26	4.63	4.28	4.04	3.88	3.76	3.66	3.59
11	0.010	9.65	7.21	6.22	5.67	5.32	5.07	4.89	4.74	4.63
11	0.001	19.69	13.81	11.56	10.35	9.58	9.05	8.66	8.35	8.12
12	0.100	3.18	2.81	2.61	2.48	2.39	2.33	2.28	2.24	2.21
12	0.050	4.75	3.89	3.49	3.26	3.11	3.00	2.91	2.85	2.80
12	0.025	6.55	5.10	4.47	4.12	3.89	3.73	3.61	3.51	3.44
12	0.010	9.33	6.93	5.95	5.41	5.06	4.82	4.64	4.50	4.39
12	0.001	18.64	12.97	10.80	9.63	8.89	8.38	8.00	7.71	7.48
13	0.100	3.14	2.76	2.56	2.43	2.35	2.28	2.23	2.20	2.16
13	0.050	4.67	3.81	3.41	3.18	3.03	2.92	2.83	2.77	2.71
13	0.025	6.41	4.97	4.35	4.00	3.77	3.60	3.48	3.39	3.31
13	0.010	9.07	6.70	5.74	5.21	4.86	4.62	4.44	4.30	4.19
13	0.001	17.82	12.31	10.21	9.07	8.35	7.86	7.49	7.21	6.98
14	0.100	3.10	2.73	2.52	2.39	2.31	2.24	2.19	2.15	2.12
14	0.050	4.60	3.74	3.34	3.11	2.96	2.85	2.76	2.70	2.65
14	0.025	6.30	4.86	4.24	3.89	3.66	3.50	3.38	3.29	3.21
14	0.010	8.86	6.51	5.56	5.04	4.69	4.46	4.28	4.14	4.03
14	0.001	17.14	11.78	9.73	8.62	7.92	7.44	7.08	6.80	6.58
15	0.100	3.07	2.70	2.49	2.36	2.27	2.21	2.16	2.12	2.09
15	0.050	4.54	3.68	3.29	3.06	2.90	2.79	2.71	2.64	2.59
15	0.025	6.20	4.77	4.15	3.80	3.58	3.41	3.29	3.20	3.12
15	0.010	8.68	6.36	5.42	4.89	4.56	4.32	4.14	4.00	3.89
15	0.001	16.59	11.34	9.34	8.25	7.57	7.09	6.74	6.47	6.26
16	0.100	3.05	2.67	2.46	2.33	2.24	2.18	2.13	2.09	2.06
16	0.050	4.49	3.63	3.24	3.01	2.85	2.74	2.66	2.59	2.54
16	0.025	6.12	4.69	4.08	3.73	3.50	3.34	3.22	3.12	3.05
16	0.010	8.53	6.23	5.29	4.77	4.44	4.20	4.03	3.89	3.78
16	0.001	16.12	10.97	9.01	7.94	7.27	6.80	6.46	6.19	5.98
17	0.100	3.03	2.64	2.44	2.31	2.22	2.15	2.10	2.06	2.03
17	0.050	4.45	3.59	3.20	2.96	2.81	2.70	2.61	2.55	2.49
17	0.025	6.04	4.62	4.01	3.66	3.44	3.28	3.16	3.06	2.98
17	0.010	8.40	6.11	5.18	4.67	4.34	4.10	3.93	3.79	3.68
17	0.001	15.72	10.66	8.73	7.68	7.02	6.56	6.22	5.96	5.75
18	0.100	3.01	2.62	2.42	2.29	2.20	2.13	2.08	2.04	2.00
18	0.050	4.41	3.55	3.16	2.93	2.77	2.66	2.58	2.51	2.46
18	0.025	5.98	4.56	3.95	3.61	3.38	3.22	3.10	3.01	2.93
18	0.010	8.29	6.01	5.09	4.58	4.25	4.01	3.84	3.71	3.60
18	0.001	15.38	10.39	8.49	7.46	6.81	6.35	6.02	5.76	5.56

Created by Jeremy Balka using the statistical software R

Critical Values of the F Distribution

A table entry is the value of F_a, having an area to the right of a under an F distribution with $df1$ degrees of freedom in the numerator, and $df2$ degrees of freedom in the denominator.
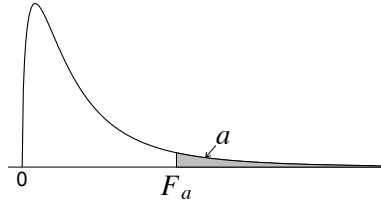
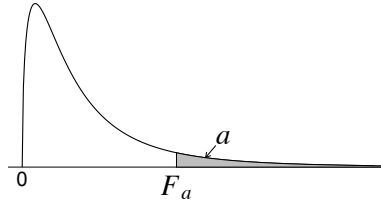|		Numerator degrees of freedom ($df1$)								
$df2$	a	10	12	15	20	25	30	50	100	1000
10	0.100	2.32	2.28	2.24	2.20	2.17	2.16	2.12	2.09	2.06
10	0.050	2.98	2.91	2.85	2.77	2.73	2.70	2.64	2.59	2.54
10	0.025	3.72	3.62	3.52	3.42	3.35	3.31	3.22	3.15	3.09
10	0.010	4.85	4.71	4.56	4.41	4.31	4.25	4.12	4.01	3.92
10	0.001	8.75	8.45	8.13	7.80	7.60	7.47	7.19	6.98	6.78
11	0.100	2.25	2.21	2.17	2.12	2.10	2.08	2.04	2.01	1.98
11	0.050	2.85	2.79	2.72	2.65	2.60	2.57	2.51	2.46	2.41
11	0.025	3.53	3.43	3.33	3.23	3.16	3.12	3.03	2.96	2.89
11	0.010	4.54	4.40	4.25	4.10	4.01	3.94	3.81	3.71	3.61
11	0.001	7.92	7.63	7.32	7.01	6.81	6.68	6.42	6.21	6.02
12	0.100	2.19	2.15	2.10	2.06	2.03	2.01	1.97	1.94	1.91
12	0.050	2.75	2.69	2.62	2.54	2.50	2.47	2.40	2.35	2.30
12	0.025	3.37	3.28	3.18	3.07	3.01	2.96	2.87	2.80	2.73
12	0.010	4.30	4.16	4.01	3.86	3.76	3.70	3.57	3.47	3.37
12	0.001	7.29	7.00	6.71	6.40	6.22	6.09	5.83	5.63	5.44
13	0.100	2.14	2.10	2.05	2.01	1.98	1.96	1.92	1.88	1.85
13	0.050	2.67	2.60	2.53	2.46	2.41	2.38	2.31	2.26	2.21
13	0.025	3.25	3.15	3.05	2.95	2.88	2.84	2.74	2.67	2.60
13	0.010	4.10	3.96	3.82	3.66	3.57	3.51	3.38	3.27	3.18
13	0.001	6.80	6.52	6.23	5.93	5.75	5.63	5.37	5.17	4.99
14	0.100	2.10	2.05	2.01	1.96	1.93	1.91	1.87	1.83	1.80
14	0.050	2.60	2.53	2.46	2.39	2.34	2.31	2.24	2.19	2.14
14	0.025	3.15	3.05	2.95	2.84	2.78	2.73	2.64	2.56	2.50
14	0.010	3.94	3.80	3.66	3.51	3.41	3.35	3.22	3.11	3.02
14	0.001	6.40	6.13	5.85	5.56	5.38	5.25	5.00	4.81	4.62
15	0.100	2.06	2.02	1.97	1.92	1.89	1.87	1.83	1.79	1.76
15	0.050	2.54	2.48	2.40	2.33	2.28	2.25	2.18	2.12	2.07
15	0.025	3.06	2.96	2.86	2.76	2.69	2.64	2.55	2.47	2.40
15	0.010	3.80	3.67	3.52	3.37	3.28	3.21	3.08	2.98	2.88
15	0.001	6.08	5.81	5.54	5.25	5.07	4.95	4.70	4.51	4.33
16	0.100	2.03	1.99	1.94	1.89	1.86	1.84	1.79	1.76	1.72
16	0.050	2.49	2.42	2.35	2.28	2.23	2.19	2.12	2.07	2.02
16	0.025	2.99	2.89	2.79	2.68	2.61	2.57	2.47	2.40	2.32
16	0.010	3.69	3.55	3.41	3.26	3.16	3.10	2.97	2.86	2.76
16	0.001	5.81	5.55	5.27	4.99	4.82	4.70	4.45	4.26	4.08
17	0.100	2.00	1.96	1.91	1.86	1.83	1.81	1.76	1.73	1.69
17	0.050	2.45	2.38	2.31	2.23	2.18	2.15	2.08	2.02	1.97
17	0.025	2.92	2.82	2.72	2.62	2.55	2.50	2.41	2.33	2.26
17	0.010	3.59	3.46	3.31	3.16	3.07	3.00	2.87	2.76	2.66
17	0.001	5.58	5.32	5.05	4.78	4.60	4.48	4.24	4.05	3.87
18	0.100	1.98	1.93	1.89	1.84	1.80	1.78	1.74	1.70	1.66
18	0.050	2.41	2.34	2.27	2.19	2.14	2.11	2.04	1.98	1.92
18	0.025	2.87	2.77	2.67	2.56	2.49	2.44	2.35	2.27	2.20
18	0.010	3.51	3.37	3.23	3.08	2.98	2.92	2.78	2.68	2.58
18	0.001	5.39	5.13	4.87	4.59	4.42	4.30	4.06	3.87	3.69

Critical Values of the F Distribution

A table entry is the value of F_a, having an area to the right of a under an F distribution with $df1$ degrees of freedom in the numerator, and $df2$ degrees of freedom in the denominator.
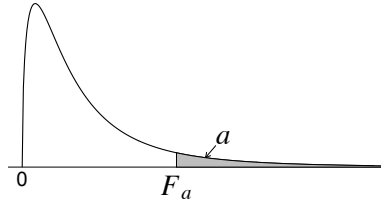
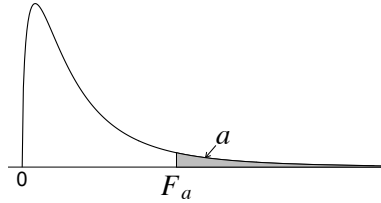|		Numerator degrees of freedom ($df1$)								
$df2$	a	1	2	3	4	5	6	7	8	9
19	0.100	2.99	2.61	2.40	2.27	2.18	2.11	2.06	2.02	1.98
19	0.050	4.38	3.52	3.13	2.90	2.74	2.63	2.54	2.48	2.42
19	0.025	5.92	4.51	3.90	3.56	3.33	3.17	3.05	2.96	2.88
19	0.010	8.18	5.93	5.01	4.50	4.17	3.94	3.77	3.63	3.52
19	0.001	15.08	10.16	8.28	7.27	6.62	6.18	5.85	5.59	5.39
20	0.100	2.97	2.59	2.38	2.25	2.16	2.09	2.04	2.00	1.96
20	0.050	4.35	3.49	3.10	2.87	2.71	2.60	2.51	2.45	2.39
20	0.025	5.87	4.46	3.86	3.51	3.29	3.13	3.01	2.91	2.84
20	0.010	8.10	5.85	4.94	4.43	4.10	3.87	3.70	3.56	3.46
20	0.001	14.82	9.95	8.10	7.10	6.46	6.02	5.69	5.44	5.24
21	0.100	2.96	2.57	2.36	2.23	2.14	2.08	2.02	1.98	1.95
21	0.050	4.32	3.47	3.07	2.84	2.68	2.57	2.49	2.42	2.37
21	0.025	5.83	4.42	3.82	3.48	3.25	3.09	2.97	2.87	2.80
21	0.010	8.02	5.78	4.87	4.37	4.04	3.81	3.64	3.51	3.40
21	0.001	14.59	9.77	7.94	6.95	6.32	5.88	5.56	5.31	5.11
22	0.100	2.95	2.56	2.35	2.22	2.13	2.06	2.01	1.97	1.93
22	0.050	4.30	3.44	3.05	2.82	2.66	2.55	2.46	2.40	2.34
22	0.025	5.79	4.38	3.78	3.44	3.22	3.05	2.93	2.84	2.76
22	0.010	7.95	5.72	4.82	4.31	3.99	3.76	3.59	3.45	3.35
22	0.001	14.38	9.61	7.80	6.81	6.19	5.76	5.44	5.19	4.99
23	0.100	2.94	2.55	2.34	2.21	2.11	2.05	1.99	1.95	1.92
23	0.050	4.28	3.42	3.03	2.80	2.64	2.53	2.44	2.37	2.32
23	0.025	5.75	4.35	3.75	3.41	3.18	3.02	2.90	2.81	2.73
23	0.010	7.88	5.66	4.76	4.26	3.94	3.71	3.54	3.41	3.30
23	0.001	14.20	9.47	7.67	6.70	6.08	5.65	5.33	5.09	4.89
24	0.100	2.93	2.54	2.33	2.19	2.10	2.04	1.98	1.94	1.91
24	0.050	4.26	3.40	3.01	2.78	2.62	2.51	2.42	2.36	2.30
24	0.025	5.72	4.32	3.72	3.38	3.15	2.99	2.87	2.78	2.70
24	0.010	7.82	5.61	4.72	4.22	3.90	3.67	3.50	3.36	3.26
24	0.001	14.03	9.34	7.55	6.59	5.98	5.55	5.23	4.99	4.80
25	0.100	2.92	2.53	2.32	2.18	2.09	2.02	1.97	1.93	1.89
25	0.050	4.24	3.39	2.99	2.76	2.60	2.49	2.40	2.34	2.28
25	0.025	5.69	4.29	3.69	3.35	3.13	2.97	2.85	2.75	2.68
25	0.010	7.77	5.57	4.68	4.18	3.85	3.63	3.46	3.32	3.22
25	0.001	13.88	9.22	7.45	6.49	5.89	5.46	5.15	4.91	4.71
26	0.100	2.91	2.52	2.31	2.17	2.08	2.01	1.96	1.92	1.88
26	0.050	4.23	3.37	2.98	2.74	2.59	2.47	2.39	2.32	2.27
26	0.025	5.66	4.27	3.67	3.33	3.10	2.94	2.82	2.73	2.65
26	0.010	7.72	5.53	4.64	4.14	3.82	3.59	3.42	3.29	3.18
26	0.001	13.74	9.12	7.36	6.41	5.80	5.38	5.07	4.83	4.64
27	0.100	2.90	2.51	2.30	2.17	2.07	2.00	1.95	1.91	1.87
27	0.050	4.21	3.35	2.96	2.73	2.57	2.46	2.37	2.31	2.25
27	0.025	5.63	4.24	3.65	3.31	3.08	2.92	2.80	2.71	2.63
27	0.010	7.68	5.49	4.60	4.11	3.78	3.56	3.39	3.26	3.15
27	0.001	13.61	9.02	7.27	6.33	5.73	5.31	5.00	4.76	4.57

Critical Values of the F Distribution

A table entry is the value of F_a, having an area to the right of a under an F distribution with $df1$ degrees of freedom in the numerator, and $df2$ degrees of freedom in the denominator.

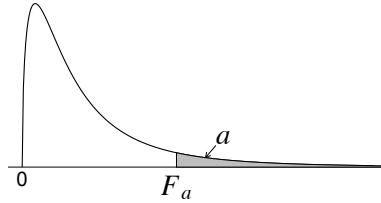|		Numerator degrees of freedom ($df1$)								
$df2$	a	10	12	15	20	25	30	50	100	1000
19	0.100	1.96	1.91	1.86	1.81	1.78	1.76	1.71	1.67	1.64
19	0.050	2.38	2.31	2.23	2.16	2.11	2.07	2.00	1.94	1.88
19	0.025	2.82	2.72	2.62	2.51	2.44	2.39	2.30	2.22	2.14
19	0.010	3.43	3.30	3.15	3.00	2.91	2.84	2.71	2.60	2.50
19	0.001	5.22	4.97	4.70	4.43	4.26	4.14	3.90	3.71	3.53
20	0.100	1.94	1.89	1.84	1.79	1.76	1.74	1.69	1.65	1.61
20	0.050	2.35	2.28	2.20	2.12	2.07	2.04	1.97	1.91	1.85
20	0.025	2.77	2.68	2.57	2.46	2.40	2.35	2.25	2.17	2.09
20	0.010	3.37	3.23	3.09	2.94	2.84	2.78	2.64	2.54	2.43
20	0.001	5.08	4.82	4.56	4.29	4.12	4.00	3.77	3.58	3.40
21	0.100	1.92	1.87	1.83	1.78	1.74	1.72	1.67	1.63	1.59
21	0.050	2.32	2.25	2.18	2.10	2.05	2.01	1.94	1.88	1.82
21	0.025	2.73	2.64	2.53	2.42	2.36	2.31	2.21	2.13	2.05
21	0.010	3.31	3.17	3.03	2.88	2.79	2.72	2.58	2.48	2.37
21	0.001	4.95	4.70	4.44	4.17	4.00	3.88	3.64	3.46	3.28
22	0.100	1.90	1.86	1.81	1.76	1.73	1.70	1.65	1.61	1.57
22	0.050	2.30	2.23	2.15	2.07	2.02	1.98	1.91	1.85	1.79
22	0.025	2.70	2.60	2.50	2.39	2.32	2.27	2.17	2.09	2.01
22	0.010	3.26	3.12	2.98	2.83	2.73	2.67	2.53	2.42	2.32
22	0.001	4.83	4.58	4.33	4.06	3.89	3.78	3.54	3.35	3.17
23	0.100	1.89	1.84	1.80	1.74	1.71	1.69	1.64	1.59	1.55
23	0.050	2.27	2.20	2.13	2.05	2.00	1.96	1.88	1.82	1.76
23	0.025	2.67	2.57	2.47	2.36	2.29	2.24	2.14	2.06	1.98
23	0.010	3.21	3.07	2.93	2.78	2.69	2.62	2.48	2.37	2.27
23	0.001	4.73	4.48	4.23	3.96	3.79	3.68	3.44	3.25	3.08
24	0.100	1.88	1.83	1.78	1.73	1.70	1.67	1.62	1.58	1.54
24	0.050	2.25	2.18	2.11	2.03	1.97	1.94	1.86	1.80	1.74
24	0.025	2.64	2.54	2.44	2.33	2.26	2.21	2.11	2.02	1.94
24	0.010	3.17	3.03	2.89	2.74	2.64	2.58	2.44	2.33	2.22
24	0.001	4.64	4.39	4.14	3.87	3.71	3.59	3.36	3.17	2.99
25	0.100	1.87	1.82	1.77	1.72	1.68	1.66	1.61	1.56	1.52
25	0.050	2.24	2.16	2.09	2.01	1.96	1.92	1.84	1.78	1.72
25	0.025	2.61	2.51	2.41	2.30	2.23	2.18	2.08	2.00	1.91
25	0.010	3.13	2.99	2.85	2.70	2.60	2.54	2.40	2.29	2.18
25	0.001	4.56	4.31	4.06	3.79	3.63	3.52	3.28	3.09	2.91
26	0.100	1.86	1.81	1.76	1.71	1.67	1.65	1.59	1.55	1.51
26	0.050	2.22	2.15	2.07	1.99	1.94	1.90	1.82	1.76	1.70
26	0.025	2.59	2.49	2.39	2.28	2.21	2.16	2.05	1.97	1.89
26	0.010	3.09	2.96	2.81	2.66	2.57	2.50	2.36	2.25	2.14
26	0.001	4.48	4.24	3.99	3.72	3.56	3.44	3.21	3.02	2.84
27	0.100	1.85	1.80	1.75	1.70	1.66	1.64	1.58	1.54	1.50
27	0.050	2.20	2.13	2.06	1.97	1.92	1.88	1.81	1.74	1.68
27	0.025	2.57	2.47	2.36	2.25	2.18	2.13	2.03	1.94	1.86
27	0.010	3.06	2.93	2.78	2.63	2.54	2.47	2.33	2.22	2.11
27	0.001	4.41	4.17	3.92	3.66	3.49	3.38	3.14	2.96	2.78

Critical Values of the F Distribution

A table entry is the value of F_a, having an area to the right of a under an F distribution with $df1$ degrees of freedom in the numerator, and $df2$ degrees of freedom in the denominator.

$df2$	a	Numerator degrees of freedom ($df1$)								
		1	2	3	4	5	6	7	8	9
28	0.100	2.89	2.50	2.29	2.16	2.06	2.00	1.94	1.90	1.87
28	0.050	4.20	3.34	2.95	2.71	2.56	2.45	2.36	2.29	2.24
28	0.025	5.61	4.22	3.63	3.29	3.06	2.90	2.78	2.69	2.61
28	0.010	7.64	5.45	4.57	4.07	3.75	3.53	3.36	3.23	3.12
28	0.001	13.50	8.93	7.19	6.25	5.66	5.24	4.93	4.69	4.50
29	0.100	2.89	2.50	2.28	2.15	2.06	1.99	1.93	1.89	1.86
29	0.050	4.18	3.33	2.93	2.70	2.55	2.43	2.35	2.28	2.22
29	0.025	5.59	4.20	3.61	3.27	3.04	2.88	2.76	2.67	2.59
29	0.010	7.60	5.42	4.54	4.04	3.73	3.50	3.33	3.20	3.09
29	0.001	13.39	8.85	7.12	6.19	5.59	5.18	4.87	4.64	4.45
30	0.100	2.88	2.49	2.28	2.14	2.05	1.98	1.93	1.88	1.85
30	0.050	4.17	3.32	2.92	2.69	2.53	2.42	2.33	2.27	2.21
30	0.025	5.57	4.18	3.59	3.25	3.03	2.87	2.75	2.65	2.57
30	0.010	7.56	5.39	4.51	4.02	3.70	3.47	3.30	3.17	3.07
30	0.001	13.29	8.77	7.05	6.12	5.53	5.12	4.82	4.58	4.39
35	0.100	2.85	2.46	2.25	2.11	2.02	1.95	1.90	1.85	1.82
35	0.050	4.12	3.27	2.87	2.64	2.49	2.37	2.29	2.22	2.16
35	0.025	5.48	4.11	3.52	3.18	2.96	2.80	2.68	2.58	2.50
35	0.010	7.42	5.27	4.40	3.91	3.59	3.37	3.20	3.07	2.96
35	0.001	12.90	8.47	6.79	5.88	5.30	4.89	4.59	4.36	4.18
40	0.100	2.84	2.44	2.23	2.09	2.00	1.93	1.87	1.83	1.79
40	0.050	4.08	3.23	2.84	2.61	2.45	2.34	2.25	2.18	2.12
40	0.025	5.42	4.05	3.46	3.13	2.90	2.74	2.62	2.53	2.45
40	0.010	7.31	5.18	4.31	3.83	3.51	3.29	3.12	2.99	2.89
40	0.001	12.61	8.25	6.59	5.70	5.13	4.73	4.44	4.21	4.02
50	0.100	2.81	2.41	2.20	2.06	1.97	1.90	1.84	1.80	1.76
50	0.050	4.03	3.18	2.79	2.56	2.40	2.29	2.20	2.13	2.07
50	0.025	5.34	3.97	3.39	3.05	2.83	2.67	2.55	2.46	2.38
50	0.010	7.17	5.06	4.20	3.72	3.41	3.19	3.02	2.89	2.78
50	0.001	12.22	7.96	6.34	5.46	4.90	4.51	4.22	4.00	3.82
100	0.100	2.76	2.36	2.14	2.00	1.91	1.83	1.78	1.73	1.69
100	0.050	3.94	3.09	2.70	2.46	2.31	2.19	2.10	2.03	1.97
100	0.025	5.18	3.83	3.25	2.92	2.70	2.54	2.42	2.32	2.24
100	0.010	6.90	4.82	3.98	3.51	3.21	2.99	2.82	2.69	2.59
100	0.001	11.50	7.41	5.86	5.02	4.48	4.11	3.83	3.61	3.44
200	0.100	2.73	2.33	2.11	1.97	1.88	1.80	1.75	1.70	1.66
200	0.050	3.89	3.04	2.65	2.42	2.26	2.14	2.06	1.98	1.93
200	0.025	5.10	3.76	3.18	2.85	2.63	2.47	2.35	2.26	2.18
200	0.010	6.76	4.71	3.88	3.41	3.11	2.89	2.73	2.60	2.50
200	0.001	11.15	7.15	5.63	4.81	4.29	3.92	3.65	3.43	3.26
1000	0.100	2.71	2.31	2.09	1.95	1.85	1.78	1.72	1.68	1.64
1000	0.050	3.85	3.00	2.61	2.38	2.22	2.11	2.02	1.95	1.89
1000	0.025	5.04	3.70	3.13	2.80	2.58	2.42	2.30	2.20	2.13
1000	0.010	6.66	4.63	3.80	3.34	3.04	2.82	2.66	2.53	2.43
1000	0.001	10.89	6.96	5.46	4.65	4.14	3.78	3.51	3.30	3.13

Created by Jeremy Balka using the statistical software R

Critical Values of the F Distribution

A table entry is the value of F_a, having an area to the right of a under an F distribution with $df1$ degrees of freedom in the numerator, and $df2$ degrees of freedom in the denominator.

$df2$	a	Numerator degrees of freedom ($df1$)								
		10	12	15	20	25	30	50	100	1000
28	0.100	1.84	1.79	1.74	1.69	1.65	1.63	1.57	1.53	1.48
28	0.050	2.19	2.12	2.04	1.96	1.91	1.87	1.79	1.73	1.66
28	0.025	2.55	2.45	2.34	2.23	2.16	2.11	2.01	1.92	1.84
28	0.010	3.03	2.90	2.75	2.60	2.51	2.44	2.30	2.19	2.08
28	0.001	4.35	4.11	3.86	3.60	3.43	3.32	3.09	2.90	2.72
29	0.100	1.83	1.78	1.73	1.68	1.64	1.62	1.56	1.52	1.47
29	0.050	2.18	2.10	2.03	1.94	1.89	1.85	1.77	1.71	1.65
29	0.025	2.53	2.43	2.32	2.21	2.14	2.09	1.99	1.90	1.82
29	0.010	3.00	2.87	2.73	2.57	2.48	2.41	2.27	2.16	2.05
29	0.001	4.29	4.05	3.80	3.54	3.38	3.27	3.03	2.84	2.66
30	0.100	1.82	1.77	1.72	1.67	1.63	1.61	1.55	1.51	1.46
30	0.050	2.16	2.09	2.01	1.93	1.88	1.84	1.76	1.70	1.63
30	0.025	2.51	2.41	2.31	2.20	2.12	2.07	1.97	1.88	1.80
30	0.010	2.98	2.84	2.70	2.55	2.45	2.39	2.25	2.13	2.02
30	0.001	4.24	4.00	3.75	3.49	3.33	3.22	2.98	2.79	2.61
35	0.100	1.79	1.74	1.69	1.63	1.60	1.57	1.51	1.47	1.42
35	0.050	2.11	2.04	1.96	1.88	1.82	1.79	1.70	1.63	1.57
35	0.025	2.44	2.34	2.23	2.12	2.05	2.00	1.89	1.80	1.71
35	0.010	2.88	2.74	2.60	2.44	2.35	2.28	2.14	2.02	1.90
35	0.001	4.03	3.79	3.55	3.29	3.13	3.02	2.78	2.59	2.40
40	0.100	1.76	1.71	1.66	1.61	1.57	1.54	1.48	1.43	1.38
40	0.050	2.08	2.00	1.92	1.84	1.78	1.74	1.66	1.59	1.52
40	0.025	2.39	2.29	2.18	2.07	1.99	1.94	1.83	1.74	1.65
40	0.010	2.80	2.66	2.52	2.37	2.27	2.20	2.06	1.94	1.82
40	0.001	3.87	3.64	3.40	3.14	2.98	2.87	2.64	2.44	2.25
50	0.100	1.73	1.68	1.63	1.57	1.53	1.50	1.44	1.39	1.33
50	0.050	2.03	1.95	1.87	1.78	1.73	1.69	1.60	1.52	1.45
50	0.025	2.32	2.22	2.11	1.99	1.92	1.87	1.75	1.66	1.56
50	0.010	2.70	2.56	2.42	2.27	2.17	2.10	1.95	1.82	1.70
50	0.001	3.67	3.44	3.20	2.95	2.79	2.68	2.44	2.25	2.05
100	0.100	1.66	1.61	1.56	1.49	1.45	1.42	1.35	1.29	1.22
100	0.050	1.93	1.85	1.77	1.68	1.62	1.57	1.48	1.39	1.30
100	0.025	2.18	2.08	1.97	1.85	1.77	1.71	1.59	1.48	1.36
100	0.010	2.50	2.37	2.22	2.07	1.97	1.89	1.74	1.60	1.45
100	0.001	3.30	3.07	2.84	2.59	2.43	2.32	2.08	1.87	1.64
200	0.100	1.63	1.58	1.52	1.46	1.41	1.38	1.31	1.24	1.16
200	0.050	1.88	1.80	1.72	1.62	1.56	1.52	1.41	1.32	1.21
200	0.025	2.11	2.01	1.90	1.78	1.70	1.64	1.51	1.39	1.25
200	0.010	2.41	2.27	2.13	1.97	1.87	1.79	1.63	1.48	1.30
200	0.001	3.12	2.90	2.67	2.42	2.26	2.15	1.90	1.68	1.43
1000	0.100	1.61	1.55	1.49	1.43	1.38	1.35	1.27	1.20	1.08
1000	0.050	1.84	1.76	1.68	1.58	1.52	1.47	1.36	1.26	1.11
1000	0.025	2.06	1.96	1.85	1.72	1.64	1.58	1.45	1.32	1.13
1000	0.010	2.34	2.20	2.06	1.90	1.79	1.72	1.54	1.38	1.16
1000	0.001	2.99	2.77	2.54	2.30	2.14	2.02	1.77	1.53	1.22

Created by Jeremy Balka using the statistical software R