

# Appendix G: F Distribution Table



## How to Use the F Distribution Table

The table is divided into two separate sections. The first section (Table G.1) gives critical values of  $F$  for the .05 level of significance; the second section (Table G.2) gives critical values of  $F$  for the .01 level of significance. First, decide the appropriate level of significance for your test. That determines which of the two sections of the table you will use. The top row of each section lists various values for  $df_1$  ( $df_1 = k - 1$ ), where  $k$  equals the number of groups or categories of the independent variable. Find the appropriate  $df$  for your data in the top row. That determines the column of the table you will use. Next, calculate the value of  $df_2$  ( $df_2 = n - k$ ) for your data and locate it in the left-hand column of the table. That determines the row of the table you will use. The quantity in the cell corresponding to the intersection of the row and column you have identified is the critical value of  $F$  for your test. If the  $F$  you have calculated for your data is equal to or greater than this quantity, your results are statistically significant at the level you have chosen.

Table G.1 Distribution of  $F$  ( $p = .05$ )

$df_1 \rightarrow$	1	2	3	4	5	6	8	10
$df_2 \downarrow$								
1	161.4	199.5	215.7	224.6	230.2	234.0	238.9	241.9
2	18.51	19.00	19.16	19.25	19.30	19.33	19.37	19.40
3	10.13	9.55	9.28	9.12	9.01	8.94	8.85	8.79
4	7.71	6.94	6.59	6.39	6.26	6.16	6.04	5.96
5	6.61	5.79	5.41	5.19	5.05	4.95	4.82	4.74
6	5.99	5.14	4.76	4.53	4.39	4.28	4.15	4.06
7	5.59	4.74	4.35	4.12	3.97	3.87	3.73	3.64

(Continued)

**Table G.1** Distribution of  $F$  ( $p = .05$ ) (Continued)

$df_1 \rightarrow$	1	2	3	4	5	6	8	10
$df_2 \downarrow$								
8	5.32	4.46	4.07	3.84	3.69	3.58	3.44	3.35
9	5.12	4.26	3.86	3.63	3.48	3.37	3.23	3.14
10	4.96	4.10	3.71	3.48	3.33	3.22	3.07	2.98
11	4.84	3.98	3.59	3.36	3.20	3.09	2.95	2.85
12	4.75	3.89	3.49	3.26	3.11	3.00	2.85	2.75
13	4.67	3.81	3.41	3.18	3.03	2.92	2.77	2.67
14	4.60	3.74	3.34	3.11	2.96	2.85	2.70	2.60
15	4.54	3.68	3.29	3.06	2.90	2.79	2.64	2.54
16	4.49	3.63	3.24	3.01	2.85	2.74	2.59	2.49
17	4.45	3.59	3.20	2.96	2.81	2.70	2.55	2.45
18	4.41	3.55	3.16	2.93	2.77	2.66	2.51	2.41
19	4.38	3.52	3.13	2.90	2.74	2.63	2.48	2.38
20	4.35	3.49	3.10	2.87	2.71	2.60	2.45	2.35
21	4.32	3.47	3.07	2.84	2.68	2.57	2.42	2.32
22	4.30	3.44	3.05	2.82	2.66	2.55	2.40	2.30
23	4.28	3.42	3.03	2.80	2.64	2.53	2.37	2.27
24	4.26	3.40	3.01	2.78	2.62	2.51	2.36	2.25
25	4.24	3.39	2.99	2.76	2.60	2.49	2.34	2.24
26	4.23	3.37	2.98	2.74	2.59	2.47	2.32	2.22
27	4.21	3.35	2.96	2.73	2.57	2.46	2.31	2.20
28	4.20	3.34	2.95	2.71	2.56	2.45	2.29	2.19
29	4.18	3.33	2.93	2.70	2.55	2.43	2.28	2.18
30	4.17	3.32	2.92	2.69	2.53	2.42	2.27	2.16
40	4.08	3.23	2.84	2.61	2.45	2.34	2.18	2.08

(Continued)

**Table G.1** Distribution of  $F(p = .05)$  (Continued)

$df_1 \rightarrow$	1	2	3	4	5	6	8	10
$df_2 \downarrow$								
60	4.00	3.15	2.76	2.53	2.37	2.25	2.10	1.99
80	3.96	3.11	2.72	2.48	2.33	2.21	2.05	1.95
120	3.92	3.07	2.68	2.45	2.29	2.17	2.02	1.91
$\infty$	3.84	3.00	2.60	2.37	2.21	2.10	1.94	1.83

  

<b>Table G.1 Distribution of <math>F(p = 0.05)</math>, Continued</b>								
$df_1 \rightarrow$	12	15	20	30	40	60	120	$\infty$
$df_2 \downarrow$								
1	243.9	245.9	248.0	250.1	251.1	252.2	253.3	254.3
2	19.41	19.43	19.45	19.46	19.47	19.48	19.49	19.50
3	8.74	8.70	8.66	8.62	8.59	8.57	8.55	8.53
4	5.91	5.86	5.80	5.75	5.72	5.69	5.66	5.63
5	4.68	4.62	4.56	4.50	4.46	4.43	4.40	4.36
6	4.00	3.94	3.87	3.81	3.77	3.74	3.70	3.67
7	3.57	3.51	3.44	3.38	3.34	3.30	3.27	3.23
8	3.28	3.22	3.15	3.08	3.04	3.01	2.97	2.93
9	3.07	3.01	2.94	2.86	2.83	2.79	2.75	2.71
10	2.91	2.85	2.77	2.70	2.66	2.62	2.58	2.54
11	2.79	2.72	2.65	2.57	2.53	2.49	2.45	2.40
12	2.69	2.62	2.54	2.47	2.43	2.38	2.34	2.30
13	2.60	2.53	2.46	2.38	2.34	2.30	2.25	2.21
14	2.53	2.46	2.39	2.31	2.27	2.22	2.18	2.13
15	2.48	2.40	2.33	2.25	2.20	2.16	2.11	2.07
16	2.42	2.35	2.28	2.19	2.15	2.11	2.06	2.01
17	2.38	2.31	2.23	2.15	2.10	2.06	2.01	1.96
18	2.34	2.27	2.19	2.11	2.06	2.02	1.97	1.92

(Continued)

**Table G.1** Distribution of  $F$  ( $p = .05$ ) (Continued)

$df_1 \rightarrow$	12	15	20	30	40	60	120	$\infty$
$df_2 \downarrow$								
19	2.31	2.23	2.16	2.07	2.03	1.98	1.93	1.88
20	2.28	2.20	2.12	2.04	1.99	1.95	1.90	1.84
21	2.25	2.18	2.10	2.01	1.96	1.92	1.87	1.81
22	2.23	2.15	2.07	1.98	1.94	1.89	1.84	1.78
23	2.20	2.13	2.05	1.96	1.91	1.86	1.81	1.76
24	2.18	2.11	2.03	1.94	1.89	1.84	1.79	1.73
25	2.16	2.09	2.01	1.92	1.87	1.82	1.77	1.71
26	2.15	2.07	1.99	1.90	1.85	1.80	1.75	1.69
27	2.13	2.06	1.97	1.88	1.84	1.79	1.73	1.67
28	2.12	2.04	1.96	1.87	1.82	1.77	1.71	1.65
29	2.10	2.03	1.94	1.85	1.81	1.75	1.70	1.64
30	2.09	2.01	1.93	1.84	1.79	1.74	1.68	1.62
40	2.00	1.92	1.84	1.74	1.69	1.64	1.58	1.51
60	1.92	1.84	1.75	1.65	1.59	1.53	1.47	1.39
80	1.88	1.80	1.70	1.60	1.54	1.49	1.41	1.32
120	1.83	1.75	1.66	1.55	1.50	1.43	1.35	1.25
$\infty$	1.75	1.67	1.57	1.46	1.39	1.32	1.22	1.00

**Table G.2** Distribution of  $F$  ( $p = 0.01$ )

$df_1 \rightarrow$	1	2	3	4	5	6	8	10
$df_2 \downarrow$								
1	4052	4999.5	5403	5625	5764	5859	5982	6056
2	98.50	99.00	99.17	99.25	99.30	99.33	99.37	99.40
3	34.12	30.82	29.46	28.71	28.24	27.91	27.49	27.23

(Continued)

**Table G.2** Distribution of  $F(p = 0.01)$  (Continued)

$df_1 \rightarrow$	1	2	3	4	5	6	8	10
$df_2 \downarrow$								
4	21.20	18.00	16.69	15.98	15.52	15.21	14.80	14.55
5	16.26	13.27	12.06	11.39	10.97	10.67	10.29	10.05
6	13.75	10.92	9.78	9.15	8.75	8.47	8.10	7.87
7	12.25	9.55	8.45	7.85	7.46	7.19	6.84	6.62
8	11.26	8.65	7.59	7.01	6.63	6.37	6.03	5.81
9	10.56	8.02	6.99	6.42	6.06	5.80	5.47	5.26
10	10.04	7.56	6.55	5.99	5.64	5.39	5.06	4.85
11	9.65	7.21	6.22	5.67	5.32	5.07	4.74	4.54
12	9.33	6.93	5.95	5.41	5.06	4.82	4.50	4.30
13	9.07	6.70	5.74	5.21	4.86	4.62	4.30	4.10
14	8.86	6.51	5.56	5.04	4.69	4.46	4.14	3.94
15	8.68	6.36	5.42	4.89	4.56	4.32	4.00	3.80
16	8.53	6.23	5.29	4.77	4.44	4.20	3.89	3.69
17	8.40	6.11	5.18	4.67	4.34	4.10	3.79	3.59
18	8.29	6.01	5.09	4.58	4.25	4.01	3.71	3.51
19	8.18	5.93	5.01	4.50	4.17	3.94	3.63	3.43
20	8.10	5.85	4.94	4.43	4.10	3.87	3.56	3.37
21	8.02	5.78	4.87	4.37	4.04	3.81	3.51	3.31
22	7.95	5.72	4.82	4.31	3.99	3.76	3.45	3.26
23	7.88	5.66	4.76	4.26	3.94	3.71	3.41	3.21
24	7.82	5.61	4.72	4.22	3.90	3.67	3.36	3.17
25	7.77	5.57	4.68	4.18	3.85	3.63	3.32	3.13
26	7.72	5.53	4.64	4.14	3.82	3.59	3.29	3.09
27	7.68	5.49	4.60	4.11	3.78	3.56	3.26	3.06

(Continued)

**Table G.2** Distribution of  $F(p = 0.01)$  (Continued)

$df_1 \rightarrow$	1	2	3	4	5	6	8	10
$df_2 \downarrow$								
28	7.64	5.45	4.57	4.07	3.75	3.53	3.23	3.03
29	7.60	5.42	4.54	4.04	3.73	3.50	3.20	3.00
30	7.56	5.39	4.51	4.02	3.70	3.47	3.17	2.98
40	7.31	5.18	4.31	3.83	3.51	3.29	2.99	2.80
60	7.08	4.98	4.13	3.65	3.34	3.12	2.82	2.63
80	6.96	4.88	4.04	3.56	3.25	3.04	2.74	2.55
120	6.85	4.79	3.95	3.48	3.17	2.96	2.66	2.47
$\infty$	6.63	4.61	3.78	3.32	3.02	2.80	2.51	2.32

  

<b>Table G.2 Distribution of <math>F(p = 0.01)</math>, Continued</b>								
$df_1 \rightarrow$	12	15	20	30	40	60	120	$\infty$
$df_2 \downarrow$								
1	6106	6157	6209	6261	6287	6313	6339	6366
2	99.42	99.43	99.45	99.47	99.47	99.48	99.49	99.50
3	27.05	26.87	26.69	26.50	26.41	26.32	26.22	26.13
4	14.37	14.20	14.02	13.84	13.75	13.65	13.56	13.46
5	9.89	9.72	9.55	9.38	9.29	9.20	9.11	9.02
6	7.72	7.56	7.40	7.23	7.14	7.06	6.97	6.88
7	6.47	6.31	6.16	5.99	5.91	5.82	5.74	5.65
8	5.67	5.52	5.36	5.20	5.12	5.03	4.95	4.86
9	5.11	4.96	4.81	4.65	4.57	4.48	4.40	4.31
10	4.71	4.56	4.41	4.25	4.17	4.08	4.00	3.91
11	4.40	4.25	4.10	3.94	3.86	3.78	3.69	3.60
12	4.16	4.01	3.86	3.70	3.62	3.54	3.45	3.36
13	3.96	3.82	3.66	3.51	3.43	3.34	3.25	3.17

(Continued)

**Table G.2** Distribution of  $F(p = 0.01)$  (Continued)

$df_1 \rightarrow$	12	15	20	30	40	60	120	$\infty$
$df_2 \downarrow$								
14	3.80	3.66	3.51	3.35	3.27	3.18	3.09	3.00
15	3.67	3.52	3.37	3.21	3.13	3.05	2.96	2.87
16	3.55	3.41	3.26	3.10	3.02	2.93	2.84	2.75
17	3.46	3.31	3.16	3.00	2.92	2.83	2.75	2.65
18	3.37	3.23	3.08	2.92	2.84	2.75	2.66	2.57
19	3.30	3.15	3.00	2.84	2.76	2.67	2.58	2.49
20	3.23	3.09	2.94	2.78	2.69	2.61	2.52	2.42
21	3.17	3.03	2.88	2.72	2.64	2.55	2.46	2.36
22	3.12	2.98	2.83	2.67	2.58	2.50	2.40	2.31
23	3.07	2.93	2.78	2.62	2.54	2.45	2.35	2.26
24	3.03	2.89	2.74	2.58	2.49	2.40	2.31	2.21
25	2.99	2.85	2.70	2.54	2.45	2.36	2.27	2.17
26	2.96	2.81	2.66	2.50	2.42	2.33	2.23	2.13
27	2.93	2.78	2.63	2.47	2.38	2.29	2.20	2.10
28	2.90	2.75	2.60	2.44	2.35	2.26	2.17	2.06
29	2.87	2.73	2.57	2.41	2.33	2.23	2.14	2.03
30	2.84	2.70	2.55	2.39	2.30	2.21	2.11	2.01
40	2.66	2.52	2.37	2.20	2.11	2.02	1.92	1.80
60	2.50	2.35	2.20	2.03	1.94	1.84	1.73	1.60
80	2.41	2.28	2.11	1.94	1.84	1.75	1.63	1.49
120	2.34	2.19	2.03	1.86	1.76	1.66	1.53	1.38
$\infty$	2.18	2.04	1.88	1.70	1.59	1.47	1.32	1.00

Source: Adapted from Table V of R. A. Fisher and F. Yates. *Statistical Tables for Biological, Agricultural and Medical Research*, 1948 edition. Reprinted by permission of Addison Wesley Longman Ltd.