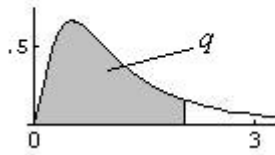


Quantiles of the F-Distribution

Tabulated values are q -th quantiles for $q \in \{.5, .75, .9, .95, .975, .99, .995\}$

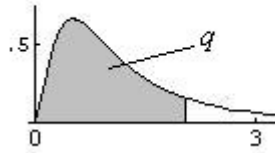
| denom- inator df | numerator degrees of freedom | | | | | | | | | | | | | |
|------------------------|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| | 1 | | | | | | | 2 | | | | | | |
| | .5 | .75 | .9 | .95 | .975 | .99 | .995 | .5 | .75 | .9 | .95 | .975 | .99 | .995 |
| 1 | 1.00 | 5.83 | 39.9 | 161 | 648 | 4052 | 16E3 | 1.50 | 7.50 | 49.5 | 199 | 800 | 5000 | 20E3 |
| 2 | 0.67 | 2.57 | 8.53 | 18.5 | 38.5 | 98.5 | 199 | 1.00 | 3.00 | 9.00 | 19.0 | 39.0 | 99.0 | 199 |
| 3 | 0.59 | 2.02 | 5.54 | 10.1 | 17.4 | 34.1 | 55.6 | 0.88 | 2.28 | 5.46 | 9.55 | 16.0 | 30.8 | 49.8 |
| 4 | 0.55 | 1.81 | 4.54 | 7.71 | 12.2 | 21.2 | 31.3 | 0.83 | 2.00 | 4.32 | 6.94 | 10.6 | 18.0 | 26.3 |
| 5 | 0.53 | 1.69 | 4.06 | 6.61 | 10.0 | 16.3 | 22.8 | 0.80 | 1.85 | 3.78 | 5.79 | 8.43 | 13.3 | 18.3 |
| 6 | 0.51 | 1.62 | 3.78 | 5.99 | 8.81 | 13.7 | 18.6 | 0.78 | 1.76 | 3.46 | 5.14 | 7.26 | 10.9 | 14.5 |
| 7 | 0.51 | 1.57 | 3.59 | 5.59 | 8.07 | 12.2 | 16.2 | 0.77 | 1.70 | 3.26 | 4.74 | 6.54 | 9.55 | 12.4 |
| 8 | 0.50 | 1.54 | 3.46 | 5.32 | 7.57 | 11.3 | 14.7 | 0.76 | 1.66 | 3.11 | 4.46 | 6.06 | 8.65 | 11.0 |
| 9 | 0.49 | 1.51 | 3.36 | 5.12 | 7.21 | 10.6 | 13.6 | 0.75 | 1.62 | 3.01 | 4.26 | 5.71 | 8.02 | 10.1 |
| 10 | 0.49 | 1.49 | 3.29 | 4.96 | 6.94 | 10.0 | 12.8 | 0.74 | 1.60 | 2.92 | 4.10 | 5.46 | 7.56 | 9.43 |
| 11 | 0.49 | 1.47 | 3.23 | 4.84 | 6.72 | 9.65 | 12.2 | 0.74 | 1.58 | 2.86 | 3.98 | 5.26 | 7.21 | 8.91 |
| 12 | 0.48 | 1.46 | 3.18 | 4.75 | 6.55 | 9.33 | 11.8 | 0.73 | 1.56 | 2.81 | 3.89 | 5.10 | 6.93 | 8.51 |
| 13 | 0.48 | 1.45 | 3.14 | 4.67 | 6.41 | 9.07 | 11.4 | 0.73 | 1.55 | 2.76 | 3.81 | 4.97 | 6.70 | 8.19 |
| 14 | 0.48 | 1.44 | 3.10 | 4.60 | 6.30 | 8.86 | 11.1 | 0.73 | 1.53 | 2.73 | 3.74 | 4.86 | 6.51 | 7.92 |
| 15 | 0.48 | 1.43 | 3.07 | 4.54 | 6.20 | 8.68 | 10.8 | 0.73 | 1.52 | 2.70 | 3.68 | 4.77 | 6.36 | 7.70 |
| 16 | 0.48 | 1.42 | 3.05 | 4.49 | 6.12 | 8.53 | 10.6 | 0.72 | 1.51 | 2.67 | 3.63 | 4.69 | 6.23 | 7.51 |
| 17 | 0.47 | 1.42 | 3.03 | 4.45 | 6.04 | 8.40 | 10.4 | 0.72 | 1.51 | 2.64 | 3.59 | 4.62 | 6.11 | 7.35 |
| 18 | 0.47 | 1.41 | 3.01 | 4.41 | 5.98 | 8.29 | 10.2 | 0.72 | 1.50 | 2.62 | 3.55 | 4.56 | 6.01 | 7.21 |
| 19 | 0.47 | 1.41 | 2.99 | 4.38 | 5.92 | 8.18 | 10.1 | 0.72 | 1.49 | 2.61 | 3.52 | 4.51 | 5.93 | 7.09 |
| 20 | 0.47 | 1.40 | 2.97 | 4.35 | 5.87 | 8.10 | 9.94 | 0.72 | 1.49 | 2.59 | 3.49 | 4.46 | 5.85 | 6.99 |
| 21 | 0.47 | 1.40 | 2.96 | 4.32 | 5.83 | 8.02 | 9.83 | 0.72 | 1.48 | 2.57 | 3.47 | 4.42 | 5.78 | 6.89 |
| 22 | 0.47 | 1.40 | 2.95 | 4.30 | 5.79 | 7.95 | 9.73 | 0.72 | 1.48 | 2.56 | 3.44 | 4.38 | 5.72 | 6.81 |
| 23 | 0.47 | 1.39 | 2.94 | 4.28 | 5.75 | 7.88 | 9.63 | 0.71 | 1.47 | 2.55 | 3.42 | 4.35 | 5.66 | 6.73 |
| 24 | 0.47 | 1.39 | 2.93 | 4.26 | 5.72 | 7.82 | 9.55 | 0.71 | 1.47 | 2.54 | 3.40 | 4.32 | 5.61 | 6.66 |
| 25 | 0.47 | 1.39 | 2.92 | 4.24 | 5.69 | 7.77 | 9.48 | 0.71 | 1.47 | 2.53 | 3.39 | 4.29 | 5.57 | 6.60 |
| 26 | 0.47 | 1.38 | 2.91 | 4.23 | 5.66 | 7.72 | 9.41 | 0.71 | 1.46 | 2.52 | 3.37 | 4.27 | 5.53 | 6.54 |
| 27 | 0.47 | 1.38 | 2.90 | 4.21 | 5.63 | 7.68 | 9.34 | 0.71 | 1.46 | 2.51 | 3.35 | 4.24 | 5.49 | 6.49 |
| 28 | 0.47 | 1.38 | 2.89 | 4.20 | 5.61 | 7.64 | 9.28 | 0.71 | 1.46 | 2.50 | 3.34 | 4.22 | 5.45 | 6.44 |
| 29 | 0.47 | 1.38 | 2.89 | 4.18 | 5.59 | 7.60 | 9.23 | 0.71 | 1.45 | 2.50 | 3.33 | 4.20 | 5.42 | 6.40 |
| 30 | 0.47 | 1.38 | 2.88 | 4.17 | 5.57 | 7.56 | 9.18 | 0.71 | 1.45 | 2.49 | 3.32 | 4.18 | 5.39 | 6.35 |
| 35 | 0.46 | 1.37 | 2.85 | 4.12 | 5.48 | 7.42 | 8.98 | 0.71 | 1.44 | 2.46 | 3.27 | 4.11 | 5.27 | 6.19 |
| 40 | 0.46 | 1.36 | 2.84 | 4.08 | 5.42 | 7.31 | 8.83 | 0.71 | 1.44 | 2.44 | 3.23 | 4.05 | 5.18 | 6.07 |
| 50 | 0.46 | 1.35 | 2.81 | 4.03 | 5.34 | 7.17 | 8.63 | 0.70 | 1.43 | 2.41 | 3.18 | 3.97 | 5.06 | 5.90 |
| 100 | 0.46 | 1.34 | 2.76 | 3.94 | 5.18 | 6.90 | 8.24 | 0.70 | 1.41 | 2.36 | 3.09 | 3.83 | 4.82 | 5.59 |
| ∞ | 0.45 | 1.32 | 2.71 | 3.84 | 5.02 | 6.63 | 7.88 | 0.69 | 1.39 | 2.30 | 3.00 | 3.69 | 4.61 | 5.30 |



Quantiles of the F-Distribution

Tabulated values are q -th quantiles for $q \in \{.5, .75, .9, .95, .975, .99, .995\}$

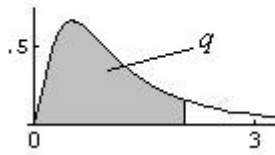
| denom- inator df | numerator degrees of freedom | | | | | | | | | | | | | |
|------------------------|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| | 3 | | | | | | | 4 | | | | | | |
| | .5 | .75 | .9 | .95 | .975 | .99 | .995 | .5 | .75 | .9 | .95 | .975 | .99 | .995 |
| 1 | 1.71 | 8.20 | 53.6 | 216 | 864 | 5403 | 22E3 | 1.82 | 8.58 | 55.8 | 225 | 900 | 5625 | 22E3 |
| 2 | 1.13 | 3.15 | 9.16 | 19.2 | 39.2 | 99.2 | 199 | 1.21 | 3.23 | 9.24 | 19.2 | 39.2 | 99.2 | 199 |
| 3 | 1.00 | 2.36 | 5.39 | 9.28 | 15.4 | 29.5 | 47.5 | 1.06 | 2.39 | 5.34 | 9.12 | 15.1 | 28.7 | 46.2 |
| 4 | 0.94 | 2.05 | 4.19 | 6.59 | 9.98 | 16.7 | 24.3 | 1.00 | 2.06 | 4.11 | 6.39 | 9.60 | 16.0 | 23.2 |
| 5 | 0.91 | 1.88 | 3.62 | 5.41 | 7.76 | 12.1 | 16.5 | 0.96 | 1.89 | 3.52 | 5.19 | 7.39 | 11.4 | 15.6 |
| 6 | 0.89 | 1.78 | 3.29 | 4.76 | 6.60 | 9.78 | 12.9 | 0.94 | 1.79 | 3.18 | 4.53 | 6.23 | 9.15 | 12.0 |
| 7 | 0.87 | 1.72 | 3.07 | 4.35 | 5.89 | 8.45 | 10.9 | 0.93 | 1.72 | 2.96 | 4.12 | 5.52 | 7.85 | 10.1 |
| 8 | 0.86 | 1.67 | 2.92 | 4.07 | 5.42 | 7.59 | 9.60 | 0.91 | 1.66 | 2.81 | 3.84 | 5.05 | 7.01 | 8.81 |
| 9 | 0.85 | 1.63 | 2.81 | 3.86 | 5.08 | 6.99 | 8.72 | 0.91 | 1.63 | 2.69 | 3.63 | 4.72 | 6.42 | 7.96 |
| 10 | 0.85 | 1.60 | 2.73 | 3.71 | 4.83 | 6.55 | 8.08 | 0.90 | 1.59 | 2.61 | 3.48 | 4.47 | 5.99 | 7.34 |
| 11 | 0.84 | 1.58 | 2.66 | 3.59 | 4.63 | 6.22 | 7.60 | 0.89 | 1.57 | 2.54 | 3.36 | 4.28 | 5.67 | 6.88 |
| 12 | 0.84 | 1.56 | 2.61 | 3.49 | 4.47 | 5.95 | 7.23 | 0.89 | 1.55 | 2.48 | 3.26 | 4.12 | 5.41 | 6.52 |
| 13 | 0.83 | 1.55 | 2.56 | 3.41 | 4.35 | 5.74 | 6.93 | 0.88 | 1.53 | 2.43 | 3.18 | 4.00 | 5.21 | 6.23 |
| 14 | 0.83 | 1.53 | 2.52 | 3.34 | 4.24 | 5.56 | 6.68 | 0.88 | 1.52 | 2.39 | 3.11 | 3.89 | 5.04 | 6.00 |
| 15 | 0.83 | 1.52 | 2.49 | 3.29 | 4.15 | 5.42 | 6.48 | 0.88 | 1.51 | 2.36 | 3.06 | 3.80 | 4.89 | 5.80 |
| 16 | 0.82 | 1.51 | 2.46 | 3.24 | 4.08 | 5.29 | 6.30 | 0.88 | 1.50 | 2.33 | 3.01 | 3.73 | 4.77 | 5.64 |
| 17 | 0.82 | 1.50 | 2.44 | 3.20 | 4.01 | 5.18 | 6.16 | 0.87 | 1.49 | 2.31 | 2.96 | 3.66 | 4.67 | 5.50 |
| 18 | 0.82 | 1.49 | 2.42 | 3.16 | 3.95 | 5.09 | 6.03 | 0.87 | 1.48 | 2.29 | 2.93 | 3.61 | 4.58 | 5.37 |
| 19 | 0.82 | 1.49 | 2.40 | 3.13 | 3.90 | 5.01 | 5.92 | 0.87 | 1.47 | 2.27 | 2.90 | 3.56 | 4.50 | 5.27 |
| 20 | 0.82 | 1.48 | 2.38 | 3.10 | 3.86 | 4.94 | 5.82 | 0.87 | 1.47 | 2.25 | 2.87 | 3.51 | 4.43 | 5.17 |
| 21 | 0.81 | 1.48 | 2.36 | 3.07 | 3.82 | 4.87 | 5.73 | 0.87 | 1.46 | 2.23 | 2.84 | 3.48 | 4.37 | 5.09 |
| 22 | 0.81 | 1.47 | 2.35 | 3.05 | 3.78 | 4.82 | 5.65 | 0.87 | 1.45 | 2.22 | 2.82 | 3.44 | 4.31 | 5.02 |
| 23 | 0.81 | 1.47 | 2.34 | 3.03 | 3.75 | 4.76 | 5.58 | 0.86 | 1.45 | 2.21 | 2.80 | 3.41 | 4.26 | 4.95 |
| 24 | 0.81 | 1.46 | 2.33 | 3.01 | 3.72 | 4.72 | 5.52 | 0.86 | 1.44 | 2.19 | 2.78 | 3.38 | 4.22 | 4.89 |
| 25 | 0.81 | 1.46 | 2.32 | 2.99 | 3.69 | 4.68 | 5.46 | 0.86 | 1.44 | 2.18 | 2.76 | 3.35 | 4.18 | 4.84 |
| 26 | 0.81 | 1.45 | 2.31 | 2.98 | 3.67 | 4.64 | 5.41 | 0.86 | 1.44 | 2.17 | 2.74 | 3.33 | 4.14 | 4.79 |
| 27 | 0.81 | 1.45 | 2.30 | 2.96 | 3.65 | 4.60 | 5.36 | 0.86 | 1.43 | 2.17 | 2.73 | 3.31 | 4.11 | 4.74 |
| 28 | 0.81 | 1.45 | 2.29 | 2.95 | 3.63 | 4.57 | 5.32 | 0.86 | 1.43 | 2.16 | 2.71 | 3.29 | 4.07 | 4.70 |
| 29 | 0.81 | 1.45 | 2.28 | 2.93 | 3.61 | 4.54 | 5.28 | 0.86 | 1.43 | 2.15 | 2.70 | 3.27 | 4.04 | 4.66 |
| 30 | 0.81 | 1.44 | 2.28 | 2.92 | 3.59 | 4.51 | 5.24 | 0.86 | 1.42 | 2.14 | 2.69 | 3.25 | 4.02 | 4.62 |
| 35 | 0.80 | 1.43 | 2.25 | 2.87 | 3.52 | 4.40 | 5.09 | 0.86 | 1.41 | 2.11 | 2.64 | 3.18 | 3.91 | 4.48 |
| 40 | 0.80 | 1.42 | 2.23 | 2.84 | 3.46 | 4.31 | 4.98 | 0.85 | 1.40 | 2.09 | 2.61 | 3.13 | 3.83 | 4.37 |
| 50 | 0.80 | 1.41 | 2.20 | 2.79 | 3.39 | 4.20 | 4.83 | 0.85 | 1.39 | 2.06 | 2.56 | 3.05 | 3.72 | 4.23 |
| 100 | 0.79 | 1.39 | 2.14 | 2.70 | 3.25 | 3.98 | 4.54 | 0.84 | 1.37 | 2.00 | 2.46 | 2.92 | 3.51 | 3.96 |
| ∞ | 0.79 | 1.37 | 2.08 | 2.60 | 3.12 | 3.78 | 4.28 | 0.84 | 1.35 | 1.94 | 2.37 | 2.79 | 3.32 | 3.72 |



Quantiles of the F-Distribution

Tabulated values are q -th quantiles for $q \in \{.5, .75, .9, .95, .975, .99, .995\}$

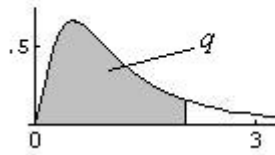
| denom- inator df | numerator degrees of freedom | | | | | | | | | | | | | |
|------------------------|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| | 5 | | | | | | | 6 | | | | | | |
| | .5 | .75 | .9 | .95 | .975 | .99 | .995 | .5 | .75 | .9 | .95 | .975 | .99 | .995 |
| 1 | 1.89 | 8.82 | 57.2 | 230 | 922 | 5764 | 23E3 | 1.94 | 8.98 | 58.2 | 234 | 937 | 5859 | 23E3 |
| 2 | 1.25 | 3.28 | 9.29 | 19.3 | 39.3 | 99.3 | 199 | 1.28 | 3.31 | 9.33 | 19.3 | 39.3 | 99.3 | 199 |
| 3 | 1.10 | 2.41 | 5.31 | 9.01 | 14.9 | 28.2 | 45.4 | 1.13 | 2.42 | 5.28 | 8.94 | 14.7 | 27.9 | 44.8 |
| 4 | 1.04 | 2.07 | 4.05 | 6.26 | 9.36 | 15.5 | 22.5 | 1.06 | 2.08 | 4.01 | 6.16 | 9.20 | 15.2 | 22.0 |
| 5 | 1.00 | 1.89 | 3.45 | 5.05 | 7.15 | 11.0 | 14.9 | 1.02 | 1.89 | 3.40 | 4.95 | 6.98 | 10.7 | 14.5 |
| 6 | 0.98 | 1.79 | 3.11 | 4.39 | 5.99 | 8.75 | 11.5 | 1.00 | 1.78 | 3.05 | 4.28 | 5.82 | 8.47 | 11.1 |
| 7 | 0.96 | 1.71 | 2.88 | 3.97 | 5.29 | 7.46 | 9.52 | 0.98 | 1.71 | 2.83 | 3.87 | 5.12 | 7.19 | 9.16 |
| 8 | 0.95 | 1.66 | 2.73 | 3.69 | 4.82 | 6.63 | 8.30 | 0.97 | 1.65 | 2.67 | 3.58 | 4.65 | 6.37 | 7.95 |
| 9 | 0.94 | 1.62 | 2.61 | 3.48 | 4.48 | 6.06 | 7.47 | 0.96 | 1.61 | 2.55 | 3.37 | 4.32 | 5.80 | 7.13 |
| 10 | 0.93 | 1.59 | 2.52 | 3.33 | 4.24 | 5.64 | 6.87 | 0.95 | 1.58 | 2.46 | 3.22 | 4.07 | 5.39 | 6.54 |
| 11 | 0.93 | 1.56 | 2.45 | 3.20 | 4.04 | 5.32 | 6.42 | 0.95 | 1.55 | 2.39 | 3.09 | 3.88 | 5.07 | 6.10 |
| 12 | 0.92 | 1.54 | 2.39 | 3.11 | 3.89 | 5.06 | 6.07 | 0.94 | 1.53 | 2.33 | 3.00 | 3.73 | 4.82 | 5.76 |
| 13 | 0.92 | 1.52 | 2.35 | 3.03 | 3.77 | 4.86 | 5.79 | 0.94 | 1.51 | 2.28 | 2.92 | 3.60 | 4.62 | 5.48 |
| 14 | 0.91 | 1.51 | 2.31 | 2.96 | 3.66 | 4.69 | 5.56 | 0.94 | 1.50 | 2.24 | 2.85 | 3.50 | 4.46 | 5.26 |
| 15 | 0.91 | 1.49 | 2.27 | 2.90 | 3.58 | 4.56 | 5.37 | 0.93 | 1.48 | 2.21 | 2.79 | 3.41 | 4.32 | 5.07 |
| 16 | 0.91 | 1.48 | 2.24 | 2.85 | 3.50 | 4.44 | 5.21 | 0.93 | 1.47 | 2.18 | 2.74 | 3.34 | 4.20 | 4.91 |
| 17 | 0.91 | 1.47 | 2.22 | 2.81 | 3.44 | 4.34 | 5.07 | 0.93 | 1.46 | 2.15 | 2.70 | 3.28 | 4.10 | 4.78 |
| 18 | 0.90 | 1.46 | 2.20 | 2.77 | 3.38 | 4.25 | 4.96 | 0.93 | 1.45 | 2.13 | 2.66 | 3.22 | 4.01 | 4.66 |
| 19 | 0.90 | 1.46 | 2.18 | 2.74 | 3.33 | 4.17 | 4.85 | 0.92 | 1.44 | 2.11 | 2.63 | 3.17 | 3.94 | 4.56 |
| 20 | 0.90 | 1.45 | 2.16 | 2.71 | 3.29 | 4.10 | 4.76 | 0.92 | 1.44 | 2.09 | 2.60 | 3.13 | 3.87 | 4.47 |
| 21 | 0.90 | 1.44 | 2.14 | 2.68 | 3.25 | 4.04 | 4.68 | 0.92 | 1.43 | 2.08 | 2.57 | 3.09 | 3.81 | 4.39 |
| 22 | 0.90 | 1.44 | 2.13 | 2.66 | 3.22 | 3.99 | 4.61 | 0.92 | 1.42 | 2.06 | 2.55 | 3.05 | 3.76 | 4.32 |
| 23 | 0.90 | 1.43 | 2.11 | 2.64 | 3.18 | 3.94 | 4.54 | 0.92 | 1.42 | 2.05 | 2.53 | 3.02 | 3.71 | 4.26 |
| 24 | 0.90 | 1.43 | 2.10 | 2.62 | 3.15 | 3.90 | 4.49 | 0.92 | 1.41 | 2.04 | 2.51 | 2.99 | 3.67 | 4.20 |
| 25 | 0.89 | 1.42 | 2.09 | 2.60 | 3.13 | 3.85 | 4.43 | 0.92 | 1.41 | 2.02 | 2.49 | 2.97 | 3.63 | 4.15 |
| 26 | 0.89 | 1.42 | 2.08 | 2.59 | 3.10 | 3.82 | 4.38 | 0.91 | 1.41 | 2.01 | 2.47 | 2.94 | 3.59 | 4.10 |
| 27 | 0.89 | 1.42 | 2.07 | 2.57 | 3.08 | 3.78 | 4.34 | 0.91 | 1.40 | 2.00 | 2.46 | 2.92 | 3.56 | 4.06 |
| 28 | 0.89 | 1.41 | 2.06 | 2.56 | 3.06 | 3.75 | 4.30 | 0.91 | 1.40 | 2.00 | 2.45 | 2.90 | 3.53 | 4.02 |
| 29 | 0.89 | 1.41 | 2.06 | 2.55 | 3.04 | 3.73 | 4.26 | 0.91 | 1.40 | 1.99 | 2.43 | 2.88 | 3.50 | 3.98 |
| 30 | 0.89 | 1.41 | 2.05 | 2.53 | 3.03 | 3.70 | 4.23 | 0.91 | 1.39 | 1.98 | 2.42 | 2.87 | 3.47 | 3.95 |
| 35 | 0.89 | 1.40 | 2.02 | 2.49 | 2.96 | 3.59 | 4.09 | 0.91 | 1.38 | 1.95 | 2.37 | 2.80 | 3.37 | 3.81 |
| 40 | 0.89 | 1.39 | 2.00 | 2.45 | 2.90 | 3.51 | 3.99 | 0.91 | 1.37 | 1.93 | 2.34 | 2.74 | 3.29 | 3.71 |
| 50 | 0.88 | 1.37 | 1.97 | 2.40 | 2.83 | 3.41 | 3.85 | 0.90 | 1.36 | 1.90 | 2.29 | 2.67 | 3.19 | 3.58 |
| 100 | 0.88 | 1.35 | 1.91 | 2.31 | 2.70 | 3.21 | 3.59 | 0.90 | 1.33 | 1.83 | 2.19 | 2.54 | 2.99 | 3.33 |
| ∞ | 0.87 | 1.33 | 1.85 | 2.21 | 2.57 | 3.02 | 3.35 | 0.89 | 1.31 | 1.77 | 2.10 | 2.41 | 2.80 | 3.09 |



Quantiles of the F-Distribution

Tabulated values are q -th quantiles for $q \in \{.5, .75, .9, .95, .975, .99, .995\}$

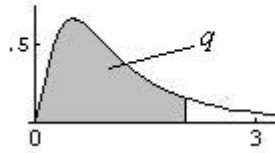
| denom- inator df | numerator degrees of freedom | | | | | | | | | | | | | |
|------------------------|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| | 7 | | | | | | | 8 | | | | | | |
| | .5 | .75 | .9 | .95 | .975 | .99 | .995 | .5 | .75 | .9 | .95 | .975 | .99 | .995 |
| 1 | 1.98 | 9.10 | 58.9 | 237 | 948 | 5928 | 24E3 | 2.00 | 9.19 | 59.4 | 239 | 957 | 5981 | 24E3 |
| 2 | 1.30 | 3.34 | 9.35 | 19.4 | 39.4 | 99.4 | 199 | 1.32 | 3.35 | 9.37 | 19.4 | 39.4 | 99.4 | 199 |
| 3 | 1.15 | 2.43 | 5.27 | 8.89 | 14.6 | 27.7 | 44.4 | 1.16 | 2.44 | 5.25 | 8.85 | 14.5 | 27.5 | 44.1 |
| 4 | 1.08 | 2.08 | 3.98 | 6.09 | 9.07 | 15.0 | 21.6 | 1.09 | 2.08 | 3.95 | 6.04 | 8.98 | 14.8 | 21.4 |
| 5 | 1.04 | 1.89 | 3.37 | 4.88 | 6.85 | 10.5 | 14.2 | 1.05 | 1.89 | 3.34 | 4.82 | 6.76 | 10.3 | 14.0 |
| 6 | 1.02 | 1.78 | 3.01 | 4.21 | 5.70 | 8.26 | 10.8 | 1.03 | 1.78 | 2.98 | 4.15 | 5.60 | 8.10 | 10.6 |
| 7 | 1.00 | 1.70 | 2.78 | 3.79 | 4.99 | 6.99 | 8.89 | 1.01 | 1.70 | 2.75 | 3.73 | 4.90 | 6.84 | 8.68 |
| 8 | 0.99 | 1.64 | 2.62 | 3.50 | 4.53 | 6.18 | 7.69 | 1.00 | 1.64 | 2.59 | 3.44 | 4.43 | 6.03 | 7.50 |
| 9 | 0.98 | 1.60 | 2.51 | 3.29 | 4.20 | 5.61 | 6.88 | 0.99 | 1.60 | 2.47 | 3.23 | 4.10 | 5.47 | 6.69 |
| 10 | 0.97 | 1.57 | 2.41 | 3.14 | 3.95 | 5.20 | 6.30 | 0.98 | 1.56 | 2.38 | 3.07 | 3.85 | 5.06 | 6.12 |
| 11 | 0.96 | 1.54 | 2.34 | 3.01 | 3.76 | 4.89 | 5.86 | 0.98 | 1.53 | 2.30 | 2.95 | 3.66 | 4.74 | 5.68 |
| 12 | 0.96 | 1.52 | 2.28 | 2.91 | 3.61 | 4.64 | 5.52 | 0.97 | 1.51 | 2.24 | 2.85 | 3.51 | 4.50 | 5.35 |
| 13 | 0.96 | 1.50 | 2.23 | 2.83 | 3.48 | 4.44 | 5.25 | 0.97 | 1.49 | 2.20 | 2.77 | 3.39 | 4.30 | 5.08 |
| 14 | 0.95 | 1.49 | 2.19 | 2.76 | 3.38 | 4.28 | 5.03 | 0.96 | 1.48 | 2.15 | 2.70 | 3.29 | 4.14 | 4.86 |
| 15 | 0.95 | 1.47 | 2.16 | 2.71 | 3.29 | 4.14 | 4.85 | 0.96 | 1.46 | 2.12 | 2.64 | 3.20 | 4.00 | 4.67 |
| 16 | 0.95 | 1.46 | 2.13 | 2.66 | 3.22 | 4.03 | 4.69 | 0.96 | 1.45 | 2.09 | 2.59 | 3.12 | 3.89 | 4.52 |
| 17 | 0.94 | 1.45 | 2.10 | 2.61 | 3.16 | 3.93 | 4.56 | 0.96 | 1.44 | 2.06 | 2.55 | 3.06 | 3.79 | 4.39 |
| 18 | 0.94 | 1.44 | 2.08 | 2.58 | 3.10 | 3.84 | 4.44 | 0.95 | 1.43 | 2.04 | 2.51 | 3.01 | 3.71 | 4.28 |
| 19 | 0.94 | 1.43 | 2.06 | 2.54 | 3.05 | 3.77 | 4.34 | 0.95 | 1.42 | 2.02 | 2.48 | 2.96 | 3.63 | 4.18 |
| 20 | 0.94 | 1.43 | 2.04 | 2.51 | 3.01 | 3.70 | 4.26 | 0.95 | 1.42 | 2.00 | 2.45 | 2.91 | 3.56 | 4.09 |
| 21 | 0.94 | 1.42 | 2.02 | 2.49 | 2.97 | 3.64 | 4.18 | 0.95 | 1.41 | 1.98 | 2.42 | 2.87 | 3.51 | 4.01 |
| 22 | 0.93 | 1.41 | 2.01 | 2.46 | 2.93 | 3.59 | 4.11 | 0.95 | 1.40 | 1.97 | 2.40 | 2.84 | 3.45 | 3.94 |
| 23 | 0.93 | 1.41 | 1.99 | 2.44 | 2.90 | 3.54 | 4.05 | 0.95 | 1.40 | 1.95 | 2.37 | 2.81 | 3.41 | 3.88 |
| 24 | 0.93 | 1.40 | 1.98 | 2.42 | 2.87 | 3.50 | 3.99 | 0.94 | 1.39 | 1.94 | 2.36 | 2.78 | 3.36 | 3.83 |
| 25 | 0.93 | 1.40 | 1.97 | 2.40 | 2.85 | 3.46 | 3.94 | 0.94 | 1.39 | 1.93 | 2.34 | 2.75 | 3.32 | 3.78 |
| 26 | 0.93 | 1.39 | 1.96 | 2.39 | 2.82 | 3.42 | 3.89 | 0.94 | 1.38 | 1.92 | 2.32 | 2.73 | 3.29 | 3.73 |
| 27 | 0.93 | 1.39 | 1.95 | 2.37 | 2.80 | 3.39 | 3.85 | 0.94 | 1.38 | 1.91 | 2.31 | 2.71 | 3.26 | 3.69 |
| 28 | 0.93 | 1.39 | 1.94 | 2.36 | 2.78 | 3.36 | 3.81 | 0.94 | 1.38 | 1.90 | 2.29 | 2.69 | 3.23 | 3.65 |
| 29 | 0.93 | 1.38 | 1.93 | 2.35 | 2.76 | 3.33 | 3.77 | 0.94 | 1.37 | 1.89 | 2.28 | 2.67 | 3.20 | 3.61 |
| 30 | 0.93 | 1.38 | 1.93 | 2.33 | 2.75 | 3.30 | 3.74 | 0.94 | 1.37 | 1.88 | 2.27 | 2.65 | 3.17 | 3.58 |
| 35 | 0.92 | 1.37 | 1.90 | 2.29 | 2.68 | 3.20 | 3.61 | 0.94 | 1.36 | 1.85 | 2.22 | 2.58 | 3.07 | 3.45 |
| 40 | 0.92 | 1.36 | 1.87 | 2.25 | 2.62 | 3.12 | 3.51 | 0.93 | 1.35 | 1.83 | 2.18 | 2.53 | 2.99 | 3.35 |
| 50 | 0.92 | 1.34 | 1.84 | 2.20 | 2.55 | 3.02 | 3.38 | 0.93 | 1.33 | 1.80 | 2.13 | 2.46 | 2.89 | 3.22 |
| 100 | 0.91 | 1.32 | 1.78 | 2.10 | 2.42 | 2.82 | 3.13 | 0.92 | 1.30 | 1.73 | 2.03 | 2.32 | 2.69 | 2.97 |
| ∞ | 0.91 | 1.29 | 1.72 | 2.01 | 2.29 | 2.64 | 2.90 | 0.92 | 1.28 | 1.67 | 1.94 | 2.19 | 2.51 | 2.74 |



Quantiles of the F-Distribution

Tabulated values are q -th quantiles for $q \in \{.5, .75, .9, .95, .975, .99, .995\}$

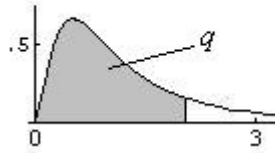
| denom- inator df | numerator degrees of freedom | | | | | | | | | | | | | |
|------------------------|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| | 9 | | | | | | | 10 | | | | | | |
| | .5 | .75 | .9 | .95 | .975 | .99 | .995 | .5 | .75 | .9 | .95 | .975 | .99 | .995 |
| 1 | 2.03 | 9.26 | 59.9 | 241 | 963 | 6022 | 24E3 | 2.04 | 9.32 | 60.2 | 242 | 969 | 6056 | 24E3 |
| 2 | 1.33 | 3.37 | 9.38 | 19.4 | 39.4 | 99.4 | 199 | 1.35 | 3.38 | 9.39 | 19.4 | 39.4 | 99.4 | 199 |
| 3 | 1.17 | 2.44 | 5.24 | 8.81 | 14.5 | 27.3 | 43.9 | 1.18 | 2.44 | 5.23 | 8.79 | 14.4 | 27.2 | 43.7 |
| 4 | 1.10 | 2.08 | 3.94 | 6.00 | 8.90 | 14.7 | 21.1 | 1.11 | 2.08 | 3.92 | 5.96 | 8.84 | 14.5 | 21.0 |
| 5 | 1.06 | 1.89 | 3.32 | 4.77 | 6.68 | 10.2 | 13.8 | 1.07 | 1.89 | 3.30 | 4.74 | 6.62 | 10.1 | 13.6 |
| 6 | 1.04 | 1.77 | 2.96 | 4.10 | 5.52 | 7.98 | 10.4 | 1.05 | 1.77 | 2.94 | 4.06 | 5.46 | 7.87 | 10.3 |
| 7 | 1.02 | 1.69 | 2.72 | 3.68 | 4.82 | 6.72 | 8.51 | 1.03 | 1.69 | 2.70 | 3.64 | 4.76 | 6.62 | 8.38 |
| 8 | 1.01 | 1.63 | 2.56 | 3.39 | 4.36 | 5.91 | 7.34 | 1.02 | 1.63 | 2.54 | 3.35 | 4.30 | 5.81 | 7.21 |
| 9 | 1.00 | 1.59 | 2.44 | 3.18 | 4.03 | 5.35 | 6.54 | 1.01 | 1.59 | 2.42 | 3.14 | 3.96 | 5.26 | 6.42 |
| 10 | 0.99 | 1.56 | 2.35 | 3.02 | 3.78 | 4.94 | 5.97 | 1.00 | 1.55 | 2.32 | 2.98 | 3.72 | 4.85 | 5.85 |
| 11 | 0.99 | 1.53 | 2.27 | 2.90 | 3.59 | 4.63 | 5.54 | 0.99 | 1.52 | 2.25 | 2.85 | 3.53 | 4.54 | 5.42 |
| 12 | 0.98 | 1.51 | 2.21 | 2.80 | 3.44 | 4.39 | 5.20 | 0.99 | 1.50 | 2.19 | 2.75 | 3.37 | 4.30 | 5.09 |
| 13 | 0.98 | 1.49 | 2.16 | 2.71 | 3.31 | 4.19 | 4.94 | 0.98 | 1.48 | 2.14 | 2.67 | 3.25 | 4.10 | 4.82 |
| 14 | 0.97 | 1.47 | 2.12 | 2.65 | 3.21 | 4.03 | 4.72 | 0.98 | 1.46 | 2.10 | 2.60 | 3.15 | 3.94 | 4.60 |
| 15 | 0.97 | 1.46 | 2.09 | 2.59 | 3.12 | 3.89 | 4.54 | 0.98 | 1.45 | 2.06 | 2.54 | 3.06 | 3.80 | 4.42 |
| 16 | 0.97 | 1.44 | 2.06 | 2.54 | 3.05 | 3.78 | 4.38 | 0.97 | 1.44 | 2.03 | 2.49 | 2.99 | 3.69 | 4.27 |
| 17 | 0.96 | 1.43 | 2.03 | 2.49 | 2.98 | 3.68 | 4.25 | 0.97 | 1.43 | 2.00 | 2.45 | 2.92 | 3.59 | 4.14 |
| 18 | 0.96 | 1.42 | 2.00 | 2.46 | 2.93 | 3.60 | 4.14 | 0.97 | 1.42 | 1.98 | 2.41 | 2.87 | 3.51 | 4.03 |
| 19 | 0.96 | 1.41 | 1.98 | 2.42 | 2.88 | 3.52 | 4.04 | 0.97 | 1.41 | 1.96 | 2.38 | 2.82 | 3.43 | 3.93 |
| 20 | 0.96 | 1.41 | 1.96 | 2.39 | 2.84 | 3.46 | 3.96 | 0.97 | 1.40 | 1.94 | 2.35 | 2.77 | 3.37 | 3.85 |
| 21 | 0.96 | 1.40 | 1.95 | 2.37 | 2.80 | 3.40 | 3.88 | 0.96 | 1.39 | 1.92 | 2.32 | 2.73 | 3.31 | 3.77 |
| 22 | 0.96 | 1.39 | 1.93 | 2.34 | 2.76 | 3.35 | 3.81 | 0.96 | 1.39 | 1.90 | 2.30 | 2.70 | 3.26 | 3.70 |
| 23 | 0.95 | 1.39 | 1.92 | 2.32 | 2.73 | 3.30 | 3.75 | 0.96 | 1.38 | 1.89 | 2.27 | 2.67 | 3.21 | 3.64 |
| 24 | 0.95 | 1.38 | 1.91 | 2.30 | 2.70 | 3.26 | 3.69 | 0.96 | 1.38 | 1.88 | 2.25 | 2.64 | 3.17 | 3.59 |
| 25 | 0.95 | 1.38 | 1.89 | 2.28 | 2.68 | 3.22 | 3.64 | 0.96 | 1.37 | 1.87 | 2.24 | 2.61 | 3.13 | 3.54 |
| 26 | 0.95 | 1.37 | 1.88 | 2.27 | 2.65 | 3.18 | 3.60 | 0.96 | 1.37 | 1.86 | 2.22 | 2.59 | 3.09 | 3.49 |
| 27 | 0.95 | 1.37 | 1.87 | 2.25 | 2.63 | 3.15 | 3.56 | 0.96 | 1.36 | 1.85 | 2.20 | 2.57 | 3.06 | 3.45 |
| 28 | 0.95 | 1.37 | 1.87 | 2.24 | 2.61 | 3.12 | 3.52 | 0.96 | 1.36 | 1.84 | 2.19 | 2.55 | 3.03 | 3.41 |
| 29 | 0.95 | 1.36 | 1.86 | 2.22 | 2.59 | 3.09 | 3.48 | 0.96 | 1.35 | 1.83 | 2.18 | 2.53 | 3.00 | 3.38 |
| 30 | 0.95 | 1.36 | 1.85 | 2.21 | 2.57 | 3.07 | 3.45 | 0.96 | 1.35 | 1.82 | 2.16 | 2.51 | 2.98 | 3.34 |
| 35 | 0.94 | 1.35 | 1.82 | 2.16 | 2.50 | 2.96 | 3.32 | 0.95 | 1.34 | 1.79 | 2.11 | 2.44 | 2.88 | 3.21 |
| 40 | 0.94 | 1.34 | 1.79 | 2.12 | 2.45 | 2.89 | 3.22 | 0.95 | 1.33 | 1.76 | 2.08 | 2.39 | 2.80 | 3.12 |
| 50 | 0.94 | 1.32 | 1.76 | 2.07 | 2.38 | 2.78 | 3.09 | 0.95 | 1.31 | 1.73 | 2.03 | 2.32 | 2.70 | 2.99 |
| 100 | 0.93 | 1.29 | 1.69 | 1.97 | 2.24 | 2.59 | 2.85 | 0.94 | 1.28 | 1.66 | 1.93 | 2.18 | 2.50 | 2.74 |
| ∞ | 0.93 | 1.27 | 1.63 | 1.88 | 2.11 | 2.41 | 2.62 | 0.93 | 1.25 | 1.60 | 1.83 | 2.05 | 2.32 | 2.52 |



Quantiles of the F-Distribution

Tabulated values are q -th quantiles for $q \in \{.5, .75, .9, .95, .975, .99, .995\}$

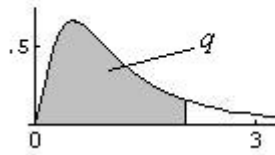
| denom- inator df | numerator degrees of freedom | | | | | | | | | | | | | |
|------------------------|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| | 11 | | | | | | | 12 | | | | | | |
| | .5 | .75 | .9 | .95 | .975 | .99 | .995 | .5 | .75 | .9 | .95 | .975 | .99 | .995 |
| 1 | 2.06 | 9.37 | 60.5 | 243 | 973 | 6083 | 24E3 | 2.07 | 9.41 | 60.7 | 244 | 977 | 6106 | 24E3 |
| 2 | 1.35 | 3.39 | 9.40 | 19.4 | 39.4 | 99.4 | 199 | 1.36 | 3.39 | 9.41 | 19.4 | 39.4 | 99.4 | 199 |
| 3 | 1.19 | 2.45 | 5.22 | 8.76 | 14.4 | 27.1 | 43.5 | 1.20 | 2.45 | 5.22 | 8.74 | 14.3 | 27.1 | 43.4 |
| 4 | 1.12 | 2.08 | 3.91 | 5.94 | 8.79 | 14.5 | 20.8 | 1.13 | 2.08 | 3.90 | 5.91 | 8.75 | 14.4 | 20.7 |
| 5 | 1.08 | 1.89 | 3.28 | 4.70 | 6.57 | 9.96 | 13.5 | 1.09 | 1.89 | 3.27 | 4.68 | 6.52 | 9.89 | 13.4 |
| 6 | 1.05 | 1.77 | 2.92 | 4.03 | 5.41 | 7.79 | 10.1 | 1.06 | 1.77 | 2.90 | 4.00 | 5.37 | 7.72 | 10.0 |
| 7 | 1.04 | 1.69 | 2.68 | 3.60 | 4.71 | 6.54 | 8.27 | 1.04 | 1.68 | 2.67 | 3.57 | 4.67 | 6.47 | 8.18 |
| 8 | 1.02 | 1.63 | 2.52 | 3.31 | 4.24 | 5.73 | 7.10 | 1.03 | 1.62 | 2.50 | 3.28 | 4.20 | 5.67 | 7.01 |
| 9 | 1.01 | 1.58 | 2.40 | 3.10 | 3.91 | 5.18 | 6.31 | 1.02 | 1.58 | 2.38 | 3.07 | 3.87 | 5.11 | 6.23 |
| 10 | 1.01 | 1.55 | 2.30 | 2.94 | 3.66 | 4.77 | 5.75 | 1.01 | 1.54 | 2.28 | 2.91 | 3.62 | 4.71 | 5.66 |
| 11 | 1.00 | 1.52 | 2.23 | 2.82 | 3.47 | 4.46 | 5.32 | 1.01 | 1.51 | 2.21 | 2.79 | 3.43 | 4.40 | 5.24 |
| 12 | 0.99 | 1.49 | 2.17 | 2.72 | 3.32 | 4.22 | 4.99 | 1.00 | 1.49 | 2.15 | 2.69 | 3.28 | 4.16 | 4.91 |
| 13 | 0.99 | 1.47 | 2.12 | 2.63 | 3.20 | 4.02 | 4.72 | 1.00 | 1.47 | 2.10 | 2.60 | 3.15 | 3.96 | 4.64 |
| 14 | 0.99 | 1.46 | 2.07 | 2.57 | 3.09 | 3.86 | 4.51 | 0.99 | 1.45 | 2.05 | 2.53 | 3.05 | 3.80 | 4.43 |
| 15 | 0.98 | 1.44 | 2.04 | 2.51 | 3.01 | 3.73 | 4.33 | 0.99 | 1.44 | 2.02 | 2.48 | 2.96 | 3.67 | 4.25 |
| 16 | 0.98 | 1.43 | 2.01 | 2.46 | 2.93 | 3.62 | 4.18 | 0.99 | 1.43 | 1.99 | 2.42 | 2.89 | 3.55 | 4.10 |
| 17 | 0.98 | 1.42 | 1.98 | 2.41 | 2.87 | 3.52 | 4.05 | 0.98 | 1.41 | 1.96 | 2.38 | 2.82 | 3.46 | 3.97 |
| 18 | 0.98 | 1.41 | 1.95 | 2.37 | 2.81 | 3.43 | 3.94 | 0.98 | 1.40 | 1.93 | 2.34 | 2.77 | 3.37 | 3.86 |
| 19 | 0.97 | 1.40 | 1.93 | 2.34 | 2.76 | 3.36 | 3.84 | 0.98 | 1.40 | 1.91 | 2.31 | 2.72 | 3.30 | 3.76 |
| 20 | 0.97 | 1.39 | 1.91 | 2.31 | 2.72 | 3.29 | 3.76 | 0.98 | 1.39 | 1.89 | 2.28 | 2.68 | 3.23 | 3.68 |
| 21 | 0.97 | 1.39 | 1.90 | 2.28 | 2.68 | 3.24 | 3.68 | 0.98 | 1.38 | 1.87 | 2.25 | 2.64 | 3.17 | 3.60 |
| 22 | 0.97 | 1.38 | 1.88 | 2.26 | 2.65 | 3.18 | 3.61 | 0.97 | 1.37 | 1.86 | 2.23 | 2.60 | 3.12 | 3.54 |
| 23 | 0.97 | 1.37 | 1.87 | 2.24 | 2.62 | 3.14 | 3.55 | 0.97 | 1.37 | 1.84 | 2.20 | 2.57 | 3.07 | 3.47 |
| 24 | 0.97 | 1.37 | 1.85 | 2.22 | 2.59 | 3.09 | 3.50 | 0.97 | 1.36 | 1.83 | 2.18 | 2.54 | 3.03 | 3.42 |
| 25 | 0.97 | 1.36 | 1.84 | 2.20 | 2.56 | 3.06 | 3.45 | 0.97 | 1.36 | 1.82 | 2.16 | 2.51 | 2.99 | 3.37 |
| 26 | 0.96 | 1.36 | 1.83 | 2.18 | 2.54 | 3.02 | 3.40 | 0.97 | 1.35 | 1.81 | 2.15 | 2.49 | 2.96 | 3.33 |
| 27 | 0.96 | 1.35 | 1.82 | 2.17 | 2.51 | 2.99 | 3.36 | 0.97 | 1.35 | 1.80 | 2.13 | 2.47 | 2.93 | 3.28 |
| 28 | 0.96 | 1.35 | 1.81 | 2.15 | 2.49 | 2.96 | 3.32 | 0.97 | 1.34 | 1.79 | 2.12 | 2.45 | 2.90 | 3.25 |
| 29 | 0.96 | 1.35 | 1.80 | 2.14 | 2.48 | 2.93 | 3.29 | 0.97 | 1.34 | 1.78 | 2.10 | 2.43 | 2.87 | 3.21 |
| 30 | 0.96 | 1.34 | 1.79 | 2.13 | 2.46 | 2.91 | 3.25 | 0.97 | 1.34 | 1.77 | 2.09 | 2.41 | 2.84 | 3.18 |
| 35 | 0.96 | 1.33 | 1.76 | 2.07 | 2.39 | 2.80 | 3.12 | 0.96 | 1.32 | 1.74 | 2.04 | 2.34 | 2.74 | 3.05 |
| 40 | 0.96 | 1.32 | 1.74 | 2.04 | 2.33 | 2.73 | 3.03 | 0.96 | 1.31 | 1.71 | 2.00 | 2.29 | 2.66 | 2.95 |
| 50 | 0.95 | 1.30 | 1.70 | 1.99 | 2.26 | 2.63 | 2.90 | 0.96 | 1.30 | 1.68 | 1.95 | 2.22 | 2.56 | 2.82 |
| 100 | 0.95 | 1.27 | 1.64 | 1.89 | 2.12 | 2.43 | 2.66 | 0.95 | 1.27 | 1.61 | 1.85 | 2.08 | 2.37 | 2.58 |
| ∞ | 0.94 | 1.25 | 1.57 | 1.79 | 1.99 | 2.25 | 2.43 | 0.95 | 1.24 | 1.55 | 1.75 | 1.94 | 2.18 | 2.36 |



Quantiles of the F-Distribution

Tabulated values are q -th quantiles for $q \in \{.5, .75, .9, .95, .975, .99, .995\}$

| denom- inator df | numerator degrees of freedom | | | | | | | | | | | | | |
|------------------------|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| | 15 | | | | | | | 20 | | | | | | |
| | .5 | .75 | .9 | .95 | .975 | .99 | .995 | .5 | .75 | .9 | .95 | .975 | .99 | .995 |
| 1 | 2.09 | 9.49 | 61.2 | 246 | 985 | 6157 | 25E3 | 2.12 | 9.58 | 61.7 | 248 | 993 | 6209 | 25E3 |
| 2 | 1.38 | 3.41 | 9.42 | 19.4 | 39.4 | 99.4 | 199 | 1.39 | 3.43 | 9.44 | 19.4 | 39.4 | 99.4 | 199 |
| 3 | 1.21 | 2.46 | 5.20 | 8.70 | 14.3 | 26.9 | 43.1 | 1.23 | 2.46 | 5.18 | 8.66 | 14.2 | 26.7 | 42.8 |
| 4 | 1.14 | 2.08 | 3.87 | 5.86 | 8.66 | 14.2 | 20.4 | 1.15 | 2.08 | 3.84 | 5.80 | 8.56 | 14.0 | 20.2 |
| 5 | 1.10 | 1.89 | 3.24 | 4.62 | 6.43 | 9.72 | 13.1 | 1.11 | 1.88 | 3.21 | 4.56 | 6.33 | 9.55 | 12.9 |
| 6 | 1.07 | 1.76 | 2.87 | 3.94 | 5.27 | 7.56 | 9.81 | 1.08 | 1.76 | 2.84 | 3.87 | 5.17 | 7.40 | 9.59 |
| 7 | 1.05 | 1.68 | 2.63 | 3.51 | 4.57 | 6.31 | 7.97 | 1.07 | 1.67 | 2.59 | 3.44 | 4.47 | 6.16 | 7.75 |
| 8 | 1.04 | 1.62 | 2.46 | 3.22 | 4.10 | 5.52 | 6.81 | 1.05 | 1.61 | 2.42 | 3.15 | 4.00 | 5.36 | 6.61 |
| 9 | 1.03 | 1.57 | 2.34 | 3.01 | 3.77 | 4.96 | 6.03 | 1.04 | 1.56 | 2.30 | 2.94 | 3.67 | 4.81 | 5.83 |
| 10 | 1.02 | 1.53 | 2.24 | 2.85 | 3.52 | 4.56 | 5.47 | 1.03 | 1.52 | 2.20 | 2.77 | 3.42 | 4.41 | 5.27 |
| 11 | 1.02 | 1.50 | 2.17 | 2.72 | 3.33 | 4.25 | 5.05 | 1.03 | 1.49 | 2.12 | 2.65 | 3.23 | 4.10 | 4.86 |
| 12 | 1.01 | 1.48 | 2.10 | 2.62 | 3.18 | 4.01 | 4.72 | 1.02 | 1.47 | 2.06 | 2.54 | 3.07 | 3.86 | 4.53 |
| 13 | 1.01 | 1.46 | 2.05 | 2.53 | 3.05 | 3.82 | 4.46 | 1.02 | 1.45 | 2.01 | 2.46 | 2.95 | 3.66 | 4.27 |
| 14 | 1.00 | 1.44 | 2.01 | 2.46 | 2.95 | 3.66 | 4.25 | 1.01 | 1.43 | 1.96 | 2.39 | 2.84 | 3.51 | 4.06 |
| 15 | 1.00 | 1.43 | 1.97 | 2.40 | 2.86 | 3.52 | 4.07 | 1.01 | 1.41 | 1.92 | 2.33 | 2.76 | 3.37 | 3.88 |
| 16 | 1.00 | 1.41 | 1.94 | 2.35 | 2.79 | 3.41 | 3.92 | 1.01 | 1.40 | 1.89 | 2.28 | 2.68 | 3.26 | 3.73 |
| 17 | 0.99 | 1.40 | 1.91 | 2.31 | 2.72 | 3.31 | 3.79 | 1.01 | 1.39 | 1.86 | 2.23 | 2.62 | 3.16 | 3.61 |
| 18 | 0.99 | 1.39 | 1.89 | 2.27 | 2.67 | 3.23 | 3.68 | 1.00 | 1.38 | 1.84 | 2.19 | 2.56 | 3.08 | 3.50 |
| 19 | 0.99 | 1.38 | 1.86 | 2.23 | 2.62 | 3.15 | 3.59 | 1.00 | 1.37 | 1.81 | 2.16 | 2.51 | 3.00 | 3.40 |
| 20 | 0.99 | 1.37 | 1.84 | 2.20 | 2.57 | 3.09 | 3.50 | 1.00 | 1.36 | 1.79 | 2.12 | 2.46 | 2.94 | 3.32 |
| 21 | 0.99 | 1.37 | 1.83 | 2.18 | 2.53 | 3.03 | 3.43 | 1.00 | 1.35 | 1.78 | 2.10 | 2.42 | 2.88 | 3.24 |
| 22 | 0.99 | 1.36 | 1.81 | 2.15 | 2.50 | 2.98 | 3.36 | 1.00 | 1.34 | 1.76 | 2.07 | 2.39 | 2.83 | 3.18 |
| 23 | 0.98 | 1.35 | 1.80 | 2.13 | 2.47 | 2.93 | 3.30 | 1.00 | 1.34 | 1.74 | 2.05 | 2.36 | 2.78 | 3.12 |
| 24 | 0.98 | 1.35 | 1.78 | 2.11 | 2.44 | 2.89 | 3.25 | 0.99 | 1.33 | 1.73 | 2.03 | 2.33 | 2.74 | 3.06 |
| 25 | 0.98 | 1.34 | 1.77 | 2.09 | 2.41 | 2.85 | 3.20 | 0.99 | 1.33 | 1.72 | 2.01 | 2.30 | 2.70 | 3.01 |
| 26 | 0.98 | 1.34 | 1.76 | 2.07 | 2.39 | 2.81 | 3.15 | 0.99 | 1.32 | 1.71 | 1.99 | 2.28 | 2.66 | 2.97 |
| 27 | 0.98 | 1.33 | 1.75 | 2.06 | 2.36 | 2.78 | 3.11 | 0.99 | 1.32 | 1.70 | 1.97 | 2.25 | 2.63 | 2.93 |
| 28 | 0.98 | 1.33 | 1.74 | 2.04 | 2.34 | 2.75 | 3.07 | 0.99 | 1.31 | 1.69 | 1.96 | 2.23 | 2.60 | 2.89 |
| 29 | 0.98 | 1.32 | 1.73 | 2.03 | 2.32 | 2.73 | 3.04 | 0.99 | 1.31 | 1.68 | 1.94 | 2.21 | 2.57 | 2.86 |
| 30 | 0.98 | 1.32 | 1.72 | 2.01 | 2.31 | 2.70 | 3.01 | 0.99 | 1.30 | 1.67 | 1.93 | 2.20 | 2.55 | 2.82 |
| 35 | 0.97 | 1.31 | 1.69 | 1.96 | 2.23 | 2.60 | 2.88 | 0.99 | 1.29 | 1.63 | 1.88 | 2.12 | 2.44 | 2.69 |
| 40 | 0.97 | 1.30 | 1.66 | 1.92 | 2.18 | 2.52 | 2.78 | 0.98 | 1.28 | 1.61 | 1.84 | 2.07 | 2.37 | 2.60 |
| 50 | 0.97 | 1.28 | 1.63 | 1.87 | 2.11 | 2.42 | 2.65 | 0.98 | 1.26 | 1.57 | 1.78 | 1.99 | 2.27 | 2.47 |
| 100 | 0.96 | 1.25 | 1.56 | 1.77 | 1.97 | 2.22 | 2.41 | 0.97 | 1.23 | 1.49 | 1.68 | 1.85 | 2.07 | 2.23 |
| ∞ | 0.96 | 1.22 | 1.49 | 1.67 | 1.83 | 2.04 | 2.19 | 0.97 | 1.19 | 1.42 | 1.57 | 1.71 | 1.88 | 2.00 |



Quantiles of the F-Distribution

Tabulated values are q -th quantiles for $q \in \{.5, .75, .9, .95, .975, .99, .995\}$

| denom- inator df | numerator degrees of freedom | | | | | | | | | | | | | |
|------------------------|------------------------------|------|------|------|------|------|------|----------|------|------|------|------|------|------|
| | 30 | | | | | | | ∞ | | | | | | |
| | .5 | .75 | .9 | .95 | .975 | .99 | .995 | .5 | .75 | .9 | .95 | .975 | .99 | .995 |
| 1 | 2.15 | 9.67 | 62.3 | 250 | 1001 | 6261 | 25E3 | 2.20 | 9.85 | 63.3 | 254 | 1018 | 6366 | 25E3 |
| 2 | 1.41 | 3.44 | 9.46 | 19.5 | 39.5 | 99.5 | 199 | 1.44 | 3.48 | 9.49 | 19.5 | 39.5 | 99.5 | 199 |
| 3 | 1.24 | 2.47 | 5.17 | 8.62 | 14.1 | 26.5 | 42.5 | 1.27 | 2.47 | 5.13 | 8.53 | 13.9 | 26.1 | 41.8 |
| 4 | 1.16 | 2.08 | 3.82 | 5.75 | 8.46 | 13.8 | 19.9 | 1.19 | 2.08 | 3.76 | 5.63 | 8.26 | 13.5 | 19.3 |
| 5 | 1.12 | 1.88 | 3.17 | 4.50 | 6.23 | 9.38 | 12.7 | 1.15 | 1.87 | 3.10 | 4.36 | 6.02 | 9.02 | 12.1 |
| 6 | 1.10 | 1.75 | 2.80 | 3.81 | 5.07 | 7.23 | 9.36 | 1.12 | 1.74 | 2.72 | 3.67 | 4.85 | 6.88 | 8.88 |
| 7 | 1.08 | 1.66 | 2.56 | 3.38 | 4.36 | 5.99 | 7.53 | 1.10 | 1.65 | 2.47 | 3.23 | 4.14 | 5.65 | 7.08 |
| 8 | 1.07 | 1.60 | 2.38 | 3.08 | 3.89 | 5.20 | 6.40 | 1.09 | 1.58 | 2.29 | 2.93 | 3.67 | 4.86 | 5.95 |
| 9 | 1.05 | 1.55 | 2.25 | 2.86 | 3.56 | 4.65 | 5.62 | 1.08 | 1.53 | 2.16 | 2.71 | 3.33 | 4.31 | 5.19 |
| 10 | 1.05 | 1.51 | 2.16 | 2.70 | 3.31 | 4.25 | 5.07 | 1.07 | 1.48 | 2.06 | 2.54 | 3.08 | 3.91 | 4.64 |
| 11 | 1.04 | 1.48 | 2.08 | 2.57 | 3.12 | 3.94 | 4.65 | 1.06 | 1.45 | 1.97 | 2.40 | 2.88 | 3.60 | 4.23 |
| 12 | 1.03 | 1.45 | 2.01 | 2.47 | 2.96 | 3.70 | 4.33 | 1.06 | 1.42 | 1.90 | 2.30 | 2.72 | 3.36 | 3.90 |
| 13 | 1.03 | 1.43 | 1.96 | 2.38 | 2.84 | 3.51 | 4.07 | 1.05 | 1.40 | 1.85 | 2.21 | 2.60 | 3.17 | 3.65 |
| 14 | 1.03 | 1.41 | 1.91 | 2.31 | 2.73 | 3.35 | 3.86 | 1.05 | 1.38 | 1.80 | 2.13 | 2.49 | 3.00 | 3.44 |
| 15 | 1.02 | 1.40 | 1.87 | 2.25 | 2.64 | 3.21 | 3.69 | 1.05 | 1.36 | 1.76 | 2.07 | 2.40 | 2.87 | 3.26 |
| 16 | 1.02 | 1.38 | 1.84 | 2.19 | 2.57 | 3.10 | 3.54 | 1.04 | 1.34 | 1.72 | 2.01 | 2.32 | 2.75 | 3.11 |
| 17 | 1.02 | 1.37 | 1.81 | 2.15 | 2.50 | 3.00 | 3.41 | 1.04 | 1.33 | 1.69 | 1.96 | 2.25 | 2.65 | 2.98 |
| 18 | 1.02 | 1.36 | 1.78 | 2.11 | 2.44 | 2.92 | 3.30 | 1.04 | 1.32 | 1.66 | 1.92 | 2.19 | 2.57 | 2.87 |
| 19 | 1.01 | 1.35 | 1.76 | 2.07 | 2.39 | 2.84 | 3.21 | 1.04 | 1.30 | 1.63 | 1.88 | 2.13 | 2.49 | 2.78 |
| 20 | 1.01 | 1.34 | 1.74 | 2.04 | 2.35 | 2.78 | 3.12 | 1.03 | 1.29 | 1.61 | 1.84 | 2.09 | 2.42 | 2.69 |
| 21 | 1.01 | 1.33 | 1.72 | 2.01 | 2.31 | 2.72 | 3.05 | 1.03 | 1.28 | 1.59 | 1.81 | 2.04 | 2.36 | 2.61 |
| 22 | 1.01 | 1.32 | 1.70 | 1.98 | 2.27 | 2.67 | 2.98 | 1.03 | 1.28 | 1.57 | 1.78 | 2.00 | 2.31 | 2.55 |
| 23 | 1.01 | 1.32 | 1.69 | 1.96 | 2.24 | 2.62 | 2.92 | 1.03 | 1.27 | 1.55 | 1.76 | 1.97 | 2.26 | 2.48 |
| 24 | 1.01 | 1.31 | 1.67 | 1.94 | 2.21 | 2.58 | 2.87 | 1.03 | 1.26 | 1.53 | 1.73 | 1.94 | 2.21 | 2.43 |
| 25 | 1.00 | 1.31 | 1.66 | 1.92 | 2.18 | 2.54 | 2.82 | 1.03 | 1.25 | 1.52 | 1.71 | 1.91 | 2.17 | 2.38 |
| 26 | 1.00 | 1.30 | 1.65 | 1.90 | 2.16 | 2.50 | 2.77 | 1.03 | 1.25 | 1.50 | 1.69 | 1.88 | 2.13 | 2.33 |
| 27 | 1.00 | 1.30 | 1.64 | 1.88 | 2.13 | 2.47 | 2.73 | 1.03 | 1.24 | 1.49 | 1.67 | 1.85 | 2.10 | 2.29 |
| 28 | 1.00 | 1.29 | 1.63 | 1.87 | 2.11 | 2.44 | 2.69 | 1.02 | 1.24 | 1.48 | 1.65 | 1.83 | 2.06 | 2.25 |
| 29 | 1.00 | 1.29 | 1.62 | 1.85 | 2.09 | 2.41 | 2.66 | 1.02 | 1.23 | 1.47 | 1.64 | 1.81 | 2.03 | 2.21 |
| 30 | 1.00 | 1.28 | 1.61 | 1.84 | 2.07 | 2.39 | 2.63 | 1.02 | 1.23 | 1.46 | 1.62 | 1.79 | 2.01 | 2.18 |
| 35 | 1.00 | 1.27 | 1.57 | 1.79 | 2.00 | 2.28 | 2.50 | 1.02 | 1.20 | 1.41 | 1.56 | 1.70 | 1.89 | 2.04 |
| 40 | 0.99 | 1.25 | 1.54 | 1.74 | 1.94 | 2.20 | 2.40 | 1.02 | 1.19 | 1.38 | 1.51 | 1.64 | 1.80 | 1.93 |
| 50 | 0.99 | 1.23 | 1.50 | 1.69 | 1.87 | 2.10 | 2.27 | 1.01 | 1.16 | 1.33 | 1.44 | 1.55 | 1.68 | 1.79 |
| 100 | 0.98 | 1.20 | 1.42 | 1.57 | 1.71 | 1.89 | 2.02 | 1.01 | 1.11 | 1.21 | 1.28 | 1.35 | 1.43 | 1.49 |
| ∞ | 0.98 | 1.16 | 1.34 | 1.46 | 1.57 | 1.70 | 1.79 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |