Student t – Table

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **one-tail** | **0.50** | **0.25** | **0.20** | **0.15** | **0.10** | **0.05** | **0.025** | **0.01** | **0.005** | **0.001** | **0.0005** |
| **two-tails** | **1.00** | **0.50** | **0.40** | **0.30** | **0.20** | **0.10** | **0.05** | **0.02** | **0.01** | **0.002** | **0.001** |
|  |  |  |  |  |  |  |  |  |  |  |  |
| 1 | 0.000 | 1.000 | 1.376 | 1.963 | 3.078 | 6.314 | 12.71 | 31.82 | 63.66 | 318.31 | 636.62 |
| 2 | 0.000 | 0.816 | 1.061 | 1.386 | 1.886 | 2.920 | 4.303 | 6.965 | 9.925 | 22.327 | 31.599 |
| 3 | 0.000 | 0.765 | 0.978 | 1.250 | 1.638 | 2.353 | 3.182 | 4.541 | 5.841 | 10.215 | 12.924 |
| 4 | 0.000 | 0.741 | 0.941 | 1.190 | 1.533 | 2.132 | 2.776 | 3.747 | 4.604 | 7.173 | 8.610 |
| 5 | 0.000 | 0.727 | 0.920 | 1.156 | 1.476 | 2.015 | 2.571 | 3.365 | 4.032 | 5.893 | 6.869 |
| 6 | 0.000 | 0.718 | 0.906 | 1.134 | 1.440 | 1.943 | 2.447 | 3.143 | 3.707 | 5.208 | 5.959 |
| 7 | 0.000 | 0.711 | 0.896 | 1.119 | 1.415 | 1.895 | 2.365 | 2.998 | 3.499 | 4.785 | 5.408 |
| 8 | 0.000 | 0.706 | 0.889 | 1.108 | 1.397 | 1.860 | 2.306 | 2.896 | 3.355 | 4.501 | 5.041 |
| 9 | 0.000 | 0.703 | 0.883 | 1.100 | 1.383 | 1.833 | 2.262 | 2.821 | 3.250 | 4.297 | 4.781 |
| 10 | 0.000 | 0.700 | 0.879 | 1.093 | 1.372 | 1.812 | 2.228 | 2.764 | 3.169 | 4.144 | 4.587 |
| 11 | 0.000 | 0.697 | 0.876 | 1.088 | 1.363 | 1.796 | 2.201 | 2.718 | 3.106 | 4.025 | 4.437 |
| 12 | 0.000 | 0.695 | 0.873 | 1.083 | 1.356 | 1.782 | 2.179 | 2.681 | 3.055 | 3.930 | 4.318 |
| 13 | 0.000 | 0.694 | 0.870 | 1.079 | 1.350 | 1.771 | 2.160 | 2.650 | 3.012 | 3.852 | 4.221 |
| 14 | 0.000 | 0.692 | 0.868 | 1.076 | 1.345 | 1.761 | 2.145 | 2.624 | 2.977 | 3.787 | 4.140 |
| 15 | 0.000 | 0.691 | 0.866 | 1.074 | 1.341 | 1.753 | 2.131 | 2.602 | 2.947 | 3.733 | 4.073 |
| 16 | 0.000 | 0.690 | 0.865 | 1.071 | 1.337 | 1.746 | 2.120 | 2.583 | 2.921 | 3.686 | 4.015 |
| 17 | 0.000 | 0.689 | 0.863 | 1.069 | 1.333 | 1.740 | 2.110 | 2.567 | 2.898 | 3.646 | 3.965 |
| 18 | 0.000 | 0.688 | 0.862 | 1.067 | 1.330 | 1.734 | 2.101 | 2.552 | 2.878 | 3.610 | 3.922 |
| 19 | 0.000 | 0.688 | 0.861 | 1.066 | 1.328 | 1.729 | 2.093 | 2.539 | 2.861 | 3.579 | 3.883 |
| 20 | 0.000 | 0.687 | 0.860 | 1.064 | 1.325 | 1.725 | 2.086 | 2.528 | 2.845 | 3.552 | 3.850 |
| 21 | 0.000 | 0.686 | 0.859 | 1.063 | 1.323 | 1.721 | 2.080 | 2.518 | 2.831 | 3.527 | 3.819 |
| 22 | 0.000 | 0.686 | 0.858 | 1.061 | 1.321 | 1.717 | 2.074 | 2.508 | 2.819 | 3.505 | 3.792 |
| 23 | 0.000 | 0.685 | 0.858 | 1.060 | 1.319 | 1.714 | 2.069 | 2.500 | 2.807 | 3.485 | 3.768 |
| 24 | 0.000 | 0.685 | 0.857 | 1.059 | 1.318 | 1.711 | 2.064 | 2.492 | 2.797 | 3.467 | 3.745 |
| 25 | 0.000 | 0.684 | 0.856 | 1.058 | 1.316 | 1.708 | 2.060 | 2.485 | 2.787 | 3.450 | 3.725 |
| 26 | 0.000 | 0.684 | 0.856 | 1.058 | 1.315 | 1.706 | 2.056 | 2.479 | 2.779 | 3.435 | 3.707 |
| 27 | 0.000 | 0.684 | 0.855 | 1.057 | 1.314 | 1.703 | 2.052 | 2.473 | 2.771 | 3.421 | 3.690 |
| 28 | 0.000 | 0.683 | 0.855 | 1.056 | 1.313 | 1.701 | 2.048 | 2.467 | 2.763 | 3.408 | 3.674 |
| 29 | 0.000 | 0.683 | 0.854 | 1.055 | 1.311 | 1.699 | 2.045 | 2.462 | 2.756 | 3.396 | 3.659 |
| 30 | 0.000 | 0.683 | 0.854 | 1.055 | 1.310 | 1.697 | 2.042 | 2.457 | 2.750 | 3.385 | 3.646 |
| 40 | 0.000 | 0.681 | 0.851 | 1.050 | 1.303 | 1.684 | 2.021 | 2.423 | 2.704 | 3.307 | 3.551 |
| 60 | 0.000 | 0.679 | 0.848 | 1.045 | 1.296 | 1.671 | 2.000 | 2.390 | 2.660 | 3.232 | 3.460 |
| 80 | 0.000 | 0.678 | 0.846 | 1.043 | 1.292 | 1.664 | 1.990 | 2.374 | 2.639 | 3.195 | 3.416 |
| 100 | 0.000 | 0.677 | 0.845 | 1.042 | 1.290 | 1.660 | 1.984 | 2.364 | 2.626 | 3.174 | 3.390 |
| 1000 | 0.000 | 0.675 | 0.842 | 1.037 | 1.282 | 1.646 | 1.962 | 2.330 | 2.581 | 3.098 | 3.300 |
| ***z*** | 0.000 | 0.674 | 0.842 | 1.036 | 1.282 | 1.645 | 1.960 | 2.326 | 2.576 | 3.090 | 3.291 |
|  | 0% | 50% | 60% | 70% | 80% | 90% | 95% | 98% | 99% | 99.8% | 99.9% |

**Confidence Level**

**Table 2: F-distribution**   0.01  1%

*Fv* ,*v*

1 2

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *V*  2 | *V*  1 | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 1 | 4051.3 | 4999.5 | 5403.5 | 5624.8 | 5763.9 | 5859.2 | 5928.6 | 5981.3 | 6022.7 | 6056.1 |
| 2 | 98.50 | 99.00 | 99.22 | 99.33 | 99.40 | 99.44 | 99.48 | 99.50 | 99.52 | 99.53 |
| 3 | 34.12 | 30.82 | 29.46 | 28.71 | 28.24 | 27.91 | 27.67 | 27.49 | 27.35 | 27.23 |
| 4 | 21.20 | 18.00 | 16.69 | 15.98 | 15.52 | 15.21 | 14.98 | 14.80 | 14.66 | 14.55 |
| 5 | 16.26 | 13.27 | 12.06 | 11.39 | 10.97 | 10.67 | 10.46 | 10.29 | 10.16 | 10.05 |
| 6 | 13.75 | 10.92 | 9.78 | 9.15 | 8.75 | 8.47 | 8.26 | 8.10 | 7.98 | 7.87 |
| 7 | 12.25 | 9.55 | 8.45 | 7.85 | 7.46 | 7.19 | 6.99 | 6.84 | 6.72 | 6.62 |
| 8 | 11.26 | 8.65 | 7.59 | 7.01 | 6.63 | 6.37 | 6.18 | 6.03 | 5.91 | 5.81 |
| 9 | 10.56 | 8.02 | 6.99 | 6.42 | 6.06 | 5.80 | 5.61 | 5.47 | 5.35 | 5.26 |
| 10 | 10.04 | 7.56 | 6.55 | 5.99 | 5.64 | 5.39 | 5.20 | 5.06 | 4.94 | 4.85 |
| 11 | 9.65 | 7.21 | 6.22 | 5.67 | 5.32 | 5.07 | 4.89 | 4.74 | 4.63 | 4.54 |
| 12 | 9.33 | 6.93 | 5.95 | 5.41 | 5.06 | 4.82 | 4.64 | 4.50 | 4.39 | 4.30 |
| 13 | 9.07 | 6.70 | 5.74 | 5.21 | 4.86 | 4.62 | 4.44 | 4.30 | 4.19 | 4.10 |
| 14 | 8.86 | 6.51 | 5.56 | 5.04 | 4.69 | 4.46 | 4.28 | 4.14 | 4.03 | 3.94 |
| 15 | 8.68 | 6.36 | 5.42 | 4.89 | 4.56 | 4.32 | 4.14 | 4.00 | 3.89 | 3.80 |
| 16 | 8.53 | 6.23 | 5.29 | 4.77 | 4.44 | 4.20 | 4.03 | 3.89 | 3.78 | 3.69 |
| 17 | 8.40 | 6.11 | 5.18 | 4.67 | 4.34 | 4.10 | 3.93 | 3.79 | 3.68 | 3.59 |
| 18 | 8.29 | 6.01 | 5.09 | 4.58 | 4.25 | 4.01 | 3.84 | 3.71 | 3.60 | 3.51 |
| 19 | 8.18 | 5.93 | 5.01 | 4.50 | 4.17 | 3.94 | 3.77 | 3.63 | 3.52 | 3.43 |
| 20 | 8.10 | 5.85 | 4.94 | 4.43 | 4.10 | 3.87 | 3.70 | 3.56 | 3.46 | 3.37 |
| 21 | 8.02 | 5.78 | 4.87 | 4.37 | 4.04 | 3.81 | 3.64 | 3.51 | 3.40 | 3.31 |
| 22 | 7.95 | 5.72 | 4.82 | 4.31 | 3.99 | 3.76 | 3.59 | 3.45 | 3.35 | 3.26 |
| 23 | 7.88 | 5.66 | 4.76 | 4.26 | 3.94 | 3.71 | 3.54 | 3.41 | 3.30 | 3.21 |
| 24 | 7.82 | 5.61 | 4.72 | 4.22 | 3.90 | 3.67 | 3.50 | 3.36 | 3.26 | 3.17 |
| 25 | 7.77 | 5.57 | 4.68 | 4.18 | 3.85 | 3.63 | 3.46 | 3.32 | 3.22 | 3.13 |
| 26 | 7.72 | 5.53 | 4.64 | 4.14 | 3.82 | 3.59 | 3.42 | 3.29 | 3.18 | 3.09 |
| 27 | 7.68 | 5.49 | 4.60 | 4.11 | 3.78 | 3.56 | 3.39 | 3.26 | 3.15 | 3.06 |
| 28 | 7.64 | 5.45 | 4.57 | 4.07 | 3.75 | 3.53 | 3.36 | 3.23 | 3.12 | 3.03 |
| 29 | 7.60 | 5.42 | 4.54 | 4.04 | 3.73 | 3.50 | 3.33 | 3.20 | 3.09 | 3.00 |
| 30 | 7.56 | 5.39 | 4.51 | 4.02 | 3.70 | 3.47 | 3.30 | 3.17 | 3.07 | 2.98 |
| 31 | 7.53 | 5.36 | 4.48 | 3.99 | 3.67 | 3.45 | 3.28 | 3.15 | 3.04 | 2.96 |
| 32 | 7.50 | 5.34 | 4.46 | 3.97 | 3.65 | 3.43 | 3.26 | 3.13 | 3.02 | 2.93 |
| 33 | 7.47 | 5.31 | 4.44 | 3.95 | 3.63 | 3.41 | 3.24 | 3.11 | 3.00 | 2.91 |
| 34 | 7.44 | 5.29 | 4.42 | 3.93 | 3.61 | 3.39 | 3.22 | 3.09 | 2.98 | 2.89 |
| 35 | 7.42 | 5.27 | 4.40 | 3.91 | 3.59 | 3.37 | 3.20 | 3.07 | 2.96 | 2.88 |
| 40 | 7.31 | 5.18 | 4.31 | 3.83 | 3.51 | 3.29 | 3.12 | 2.99 | 2.89 | 2.80 |
| 45 | 7.23 | 5.11 | 4.25 | 3.77 | 3.45 | 3.23 | 3.07 | 2.94 | 2.83 | 2.74 |
| 50 | 7.17 | 5.06 | 4.20 | 3.72 | 3.41 | 3.19 | 3.02 | 2.89 | 2.78 | 2.70 |
| 60 | 7.08 | 4.98 | 4.13 | 3.65 | 3.34 | 3.12 | 2.95 | 2.82 | 2.72 | 2.63 |
| 120 | 6.85 | 4.79 | 3.95 | 3.48 | 3.17 | 2.96 | 2.79 | 2.66 | 2.56 | 2.47 |
|  | 6.63 | 4.61 | 3.78 | 3.32 | 3.02 | 2.80 | 2.64 | 2.51 | 2.41 | 2.32 |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *V*  2 | *V*  1 | | | | | | | | | |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 1 | 6083.6 | 6106.6 | 6126.2 | 6142.9 | 6157.6 | 6170.4 | 6181.7 | 6191.8 | 6200.9 | 6209.0 |
| 2 | 99.54 | 99.55 | 99.56 | 99.57 | 99.58 | 99.58 | 99.59 | 99.59 | 99.60 | 99.60 |
| 3 | 27.13 | 27.05 | 26.98 | 26.92 | 26.87 | 26.83 | 26.79 | 26.75 | 26.72 | 26.69 |
| 4 | 14.45 | 14.37 | 14.31 | 14.25 | 14.20 | 14.15 | 14.11 | 14.08 | 14.05 | 14.02 |
| 5 | 9.96 | 9.89 | 9.82 | 9.77 | 9.72 | 9.68 | 9.64 | 9.61 | 9.58 | 9.55 |
| 6 | 7.79 | 7.72 | 7.66 | 7.60 | 7.56 | 7.52 | 7.48 | 7.45 | 7.42 | 7.40 |
| 7 | 6.54 | 6.47 | 6.41 | 6.36 | 6.31 | 6.27 | 6.24 | 6.21 | 6.18 | 6.16 |
| 8 | 5.73 | 5.67 | 5.61 | 5.56 | 5.52 | 5.48 | 5.44 | 5.41 | 5.38 | 5.36 |
| 9 | 5.18 | 5.11 | 5.05 | 5.01 | 4.96 | 4.92 | 4.89 | 4.86 | 4.83 | 4.81 |
| 10 | 4.77 | 4.71 | 4.65 | 4.60 | 4.56 | 4.52 | 4.49 | 4.46 | 4.43 | 4.41 |
| 11 | 4.46 | 4.40 | 4.34 | 4.29 | 4.25 | 4.21 | 4.18 | 4.15 | 4.12 | 4.10 |
| 12 | 4.22 | 4.16 | 4.10 | 4.05 | 4.01 | 3.97 | 3.94 | 3.91 | 3.88 | 3.86 |
| 13 | 4.02 | 3.96 | 3.91 | 3.86 | 3.82 | 3.78 | 3.75 | 3.72 | 3.69 | 3.66 |
| 14 | 3.86 | 3.80 | 3.75 | 3.70 | 3.66 | 3.62 | 3.59 | 3.56 | 3.53 | 3.51 |
| 15 | 3.73 | 3.67 | 3.61 | 3.56 | 3.52 | 3.49 | 3.45 | 3.42 | 3.40 | 3.37 |
| 16 | 3.62 | 3.55 | 3.50 | 3.45 | 3.41 | 3.37 | 3.34 | 3.31 | 3.28 | 3.26 |
| 17 | 3.52 | 3.46 | 3.40 | 3.35 | 3.31 | 3.27 | 3.24 | 3.21 | 3.19 | 3.16 |
| 18 | 3.43 | 3.37 | 3.32 | 3.27 | 3.23 | 3.19 | 3.16 | 3.13 | 3.10 | 3.08 |
| 19 | 3.36 | 3.30 | 3.24 | 3.19 | 3.15 | 3.12 | 3.08 | 3.05 | 3.03 | 3.00 |
| 20 | 3.29 | 3.23 | 3.18 | 3.13 | 3.09 | 3.05 | 3.02 | 2.99 | 2.96 | 2.94 |
| 21 | 3.24 | 3.17 | 3.12 | 3.07 | 3.03 | 2.99 | 2.96 | 2.93 | 2.90 | 2.88 |
| 22 | 3.18 | 3.12 | 3.07 | 3.02 | 2.98 | 2.94 | 2.91 | 2.88 | 2.85 | 2.83 |
| 23 | 3.14 | 3.07 | 3.02 | 2.97 | 2.93 | 2.89 | 2.86 | 2.83 | 2.80 | 2.78 |
| 24 | 3.09 | 3.03 | 2.98 | 2.93 | 2.89 | 2.85 | 2.82 | 2.79 | 2.76 | 2.74 |
| 25 | 3.06 | 2.99 | 2.94 | 2.89 | 2.85 | 2.81 | 2.78 | 2.75 | 2.72 | 2.70 |
| 26 | 3.02 | 2.96 | 2.90 | 2.86 | 2.81 | 2.78 | 2.75 | 2.72 | 2.69 | 2.66 |
| 27 | 2.99 | 2.93 | 2.87 | 2.82 | 2.78 | 2.75 | 2.71 | 2.68 | 2.66 | 2.63 |
| 28 | 2.96 | 2.90 | 2.84 | 2.79 | 2.75 | 2.72 | 2.68 | 2.65 | 2.63 | 2.60 |
| 29 | 2.93 | 2.87 | 2.81 | 2.77 | 2.73 | 2.69 | 2.66 | 2.63 | 2.60 | 2.57 |
| 30 | 2.91 | 2.84 | 2.79 | 2.74 | 2.70 | 2.66 | 2.63 | 2.60 | 2.57 | 2.55 |
| 31 | 2.88 | 2.82 | 2.77 | 2.72 | 2.68 | 2.64 | 2.61 | 2.58 | 2.55 | 2.52 |
| 32 | 2.86 | 2.80 | 2.74 | 2.70 | 2.65 | 2.62 | 2.58 | 2.55 | 2.53 | 2.50 |
| 33 | 2.84 | 2.78 | 2.72 | 2.68 | 2.63 | 2.60 | 2.56 | 2.53 | 2.51 | 2.48 |
| 34 | 2.82 | 2.76 | 2.70 | 2.66 | 2.61 | 2.58 | 2.54 | 2.51 | 2.49 | 2.46 |
| 35 | 2.80 | 2.74 | 2.69 | 2.64 | 2.60 | 2.56 | 2.53 | 2.50 | 2.47 | 2.44 |
| 40 | 2.73 | 2.66 | 2.61 | 2.56 | 2.52 | 2.48 | 2.45 | 2.42 | 2.39 | 2.37 |
| 45 | 2.67 | 2.61 | 2.55 | 2.51 | 2.46 | 2.43 | 2.39 | 2.36 | 2.34 | 2.31 |
| 50 | 2.63 | 2.56 | 2.51 | 2.46 | 2.42 | 2.38 | 2.35 | 2.32 | 2.29 | 2.27 |
| 60 | 2.56 | 2.50 | 2.44 | 2.39 | 2.35 | 2.31 | 2.28 | 2.25 | 2.22 | 2.20 |
| 120 | 2.40 | 2.34 | 2.28 | 2.23 | 2.19 | 2.15 | 2.12 | 2.09 | 2.06 | 2.03 |
|  | 2.25 | 2.18 | 2.13 | 2.08 | 2.04 | 2.00 | 1.97 | 1.93 | 1.90 | 1.88 |

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *V*  2 | *V*  1 | | | | | | | | | | |
| 21 | 22 | 23 | 24 | 25 | 30 | 35 | 40 | 60 | 120 |  |
| 1 | 6216.4 | 6223.2 | 6229.3 | 6234.9 | 6240.1 | 6261.0 | 6275.9 | 6287.1 | 6313.4 | 6339.7 | 6365.9 |
| 2 | 99.60 | 99.61 | 99.61 | 99.61 | 99.61 | 99.62 | 99.63 | 99.63 | 99.64 | 99.65 | 99.50 |
| 3 | 26.66 | 26.64 | 26.62 | 26.60 | 26.58 | 26.47 | 26.42 | 26.38 | 26.29 | 26.19 | 26.13 |
| 4 | 13.99 | 13.97 | 13.95 | 13.93 | 13.91 | 13.84 | 13.78 | 13.75 | 13.65 | 13.56 | 13.46 |
| 5 | 9.53 | 9.51 | 9.49 | 9.47 | 9.45 | 9.38 | 9.33 | 9.29 | 9.20 | 9.11 | 9.02 |
| 6 | 7.37 | 7.35 | 7.33 | 7.31 | 7.30 | 7.23 | 7.18 | 7.14 | 7.06 | 6.97 | 6.88 |
| 7 | 6.13 | 6.11 | 6.09 | 6.07 | 6.06 | 5.99 | 5.94 | 5.91 | 5.82 | 5.74 | 5.65 |
| 8 | 5.34 | 5.32 | 5.30 | 5.28 | 5.26 | 5.20 | 5.15 | 5.12 | 5.03 | 4.95 | 4.86 |
| 9 | 4.79 | 4.77 | 4.75 | 4.73 | 4.71 | 4.65 | 4.60 | 4.57 | 4.48 | 4.40 | 4.31 |
| 10 | 4.38 | 4.36 | 4.34 | 4.33 | 4.31 | 4.25 | 4.20 | 4.16 | 4.08 | 4.00 | 3.91 |
| 11 | 4.08 | 4.06 | 4.04 | 4.02 | 4.01 | 3.94 | 3.89 | 3.86 | 3.78 | 3.69 | 3.60 |
| 12 | 3.84 | 3.82 | 3.80 | 3.78 | 3.76 | 3.70 | 3.65 | 3.62 | 3.54 | 3.45 | 3.36 |
| 13 | 3.64 | 3.62 | 3.60 | 3.59 | 3.57 | 3.51 | 3.46 | 3.43 | 3.34 | 3.25 | 3.17 |
| 14 | 3.48 | 3.46 | 3.44 | 3.43 | 3.41 | 3.35 | 3.30 | 3.27 | 3.18 | 3.09 | 3.00 |
| 15 | 3.35 | 3.33 | 3.31 | 3.29 | 3.28 | 3.21 | 3.17 | 3.13 | 3.05 | 2.96 | 2.87 |
| 16 | 3.24 | 3.22 | 3.20 | 3.18 | 3.16 | 3.10 | 3.05 | 3.02 | 2.93 | 2.84 | 2.75 |
| 17 | 3.14 | 3.12 | 3.10 | 3.08 | 3.07 | 3.00 | 2.96 | 2.92 | 2.83 | 2.75 | 2.65 |
| 18 | 3.05 | 3.03 | 3.02 | 3.00 | 2.98 | 2.92 | 2.87 | 2.84 | 2.75 | 2.66 | 2.57 |
| 19 | 2.98 | 2.96 | 2.94 | 2.92 | 2.91 | 2.84 | 2.80 | 2.76 | 2.67 | 2.58 | 2.49 |
| 20 | 2.92 | 2.90 | 2.88 | 2.86 | 2.84 | 2.78 | 2.73 | 2.69 | 2.61 | 2.52 | 2.42 |
| 21 | 2.86 | 2.84 | 2.82 | 2.80 | 2.79 | 2.72 | 2.67 | 2.64 | 2.55 | 2.46 | 2.36 |
| 22 | 2.81 | 2.78 | 2.77 | 2.75 | 2.73 | 2.67 | 2.62 | 2.58 | 2.50 | 2.40 | 2.31 |
| 23 | 2.76 | 2.74 | 2.72 | 2.70 | 2.69 | 2.62 | 2.57 | 2.54 | 2.45 | 2.35 | 2.26 |
| 24 | 2.72 | 2.70 | 2.68 | 2.66 | 2.64 | 2.58 | 2.53 | 2.49 | 2.40 | 2.31 | 2.21 |
| 25 | 2.68 | 2.66 | 2.64 | 2.62 | 2.60 | 2.54 | 2.49 | 2.45 | 2.36 | 2.27 | 2.17 |
| 26 | 2.64 | 2.62 | 2.60 | 2.58 | 2.57 | 2.50 | 2.45 | 2.42 | 2.33 | 2.23 | 2.13 |
| 27 | 2.61 | 2.59 | 2.57 | 2.55 | 2.54 | 2.47 | 2.42 | 2.38 | 2.29 | 2.20 | 2.10 |
| 28 | 2.58 | 2.56 | 2.54 | 2.52 | 2.51 | 2.44 | 2.39 | 2.35 | 2.26 | 2.17 | 2.06 |
| 29 | 2.55 | 2.53 | 2.51 | 2.49 | 2.48 | 2.41 | 2.36 | 2.33 | 2.23 | 2.14 | 2.03 |
| 30 | 2.53 | 2.51 | 2.49 | 2.47 | 2.45 | 2.39 | 2.34 | 2.30 | 2.21 | 2.11 | 2.01 |
| 31 | 2.50 | 2.48 | 2.46 | 2.45 | 2.43 | 2.36 | 2.31 | 2.27 | 2.18 | 2.09 | 1.98 |
| 32 | 2.48 | 2.46 | 2.44 | 2.42 | 2.41 | 2.34 | 2.29 | 2.25 | 2.16 | 2.06 | 1.96 |
| 33 | 2.46 | 2.44 | 2.42 | 2.40 | 2.39 | 2.32 | 2.27 | 2.23 | 2.14 | 2.04 | 1.93 |
| 34 | 2.44 | 2.42 | 2.40 | 2.38 | 2.37 | 2.30 | 2.25 | 2.21 | 2.12 | 2.02 | 1.91 |
| 35 | 2.42 | 2.40 | 2.38 | 2.36 | 2.35 | 2.28 | 2.23 | 2.19 | 2.10 | 2.00 | 1.89 |
| 40 | 2.35 | 2.33 | 2.31 | 2.29 | 2.27 | 2.20 | 2.15 | 2.11 | 2.02 | 1.92 | 1.80 |
| 45 | 2.29 | 2.27 | 2.25 | 2.23 | 2.21 | 2.14 | 2.09 | 2.05 | 1.96 | 1.85 | 1.74 |
| 50 | 2.24 | 2.22 | 2.20 | 2.18 | 2.17 | 2.10 | 2.05 | 2.01 | 1.91 | 1.80 | 1.68 |
| 60 | 2.17 | 2.15 | 2.13 | 2.12 | 2.10 | 2.03 | 1.98 | 1.94 | 1.84 | 1.73 | 1.60 |
| 120 | 2.01 | 1.99 | 1.97 | 1.95 | 1.93 | 1.86 | 1.81 | 1.76 | 1.66 | 1.53 | 1.38 |
|  | 1.85 | 1.83 | 1.81 | 1.79 | 1.77 | 1.70 | 1.64 | 1.59 | 1.47 | 1.32 | 1.00 |

**Table 3: F-distribution**   0.05  5%

*Fv* ,*v*

1 2

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *V*  2 | *V*  1 | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 1 | 161.55 | 199.71 | 215.95 | 224.84 | 230.42 | 234.25 | 237.04 | 239.16 | 240.82 | 242.16 |
| 2 | 18.51 | 19.00 | 19.16 | 19.25 | 19.30 | 19.33 | 19.35 | 19.37 | 19.38 | 19.40 |
| 3 | 10.13 | 9.55 | 9.28 | 9.12 | 9.01 | 8.94 | 8.89 | 8.85 | 8.81 | 8.79 |
| 4 | 7.71 | 6.94 | 6.59 | 6.39 | 6.26 | 6.16 | 6.09 | 6.04 | 6.00 | 5.96 |
| 5 | 6.61 | 5.79 | 5.41 | 5.19 | 5.05 | 4.95 | 4.88 | 4.82 | 4.77 | 4.73 |
| 6 | 5.99 | 5.14 | 4.76 | 4.53 | 4.39 | 4.28 | 4.21 | 4.15 | 4.10 | 4.06 |
| 7 | 5.59 | 4.74 | 4.35 | 4.12 | 3.97 | 3.87 | 3.79 | 3.73 | 3.68 | 3.64 |
| 8 | 5.32 | 4.46 | 4.07 | 3.84 | 3.69 | 3.58 | 3.50 | 3.44 | 3.39 | 3.35 |
| 9 | 5.12 | 4.26 | 3.86 | 3.63 | 3.48 | 3.37 | 3.29 | 3.23 | 3.18 | 3.14 |
| 10 | 4.96 | 4.10 | 3.71 | 3.48 | 3.33 | 3.22 | 3.14 | 3.07 | 3.02 | 2.98 |
| 11 | 4.84 | 3.98 | 3.59 | 3.36 | 3.20 | 3.09 | 3.01 | 2.95 | 2.90 | 2.85 |
| 12 | 4.75 | 3.89 | 3.49 | 3.26 | 3.11 | 3.00 | 2.91 | 2.85 | 2.80 | 2.75 |
| 13 | 4.67 | 3.81 | 3.41 | 3.18 | 3.03 | 2.92 | 2.83 | 2.77 | 2.71 | 2.67 |
| 14 | 4.60 | 3.74 | 3.34 | 3.11 | 2.96 | 2.85 | 2.76 | 2.70 | 2.65 | 2.60 |
| 15 | 4.54 | 3.68 | 3.29 | 3.06 | 2.90 | 2.79 | 2.71 | 2.64 | 2.59 | 2.54 |
| 16 | 4.49 | 3.63 | 3.24 | 3.01 | 2.85 | 2.74 | 2.66 | 2.59 | 2.54 | 2.49 |
| 17 | 4.45 | 3.59 | 3.20 | 2.96 | 2.81 | 2.70 | 2.61 | 2.55 | 2.49 | 2.45 |
| 18 | 4.41 | 3.55 | 3.16 | 2.93 | 2.77 | 2.66 | 2.58 | 2.51 | 2.46 | 2.41 |
| 19 | 4.38 | 3.52 | 3.13 | 2.90 | 2.74 | 2.63 | 2.54 | 2.48 | 2.42 | 2.38 |
| 20 | 4.35 | 3.49 | 3.10 | 2.87 | 2.71 | 2.60 | 2.51 | 2.45 | 2.39 | 2.35 |
| 21 | 4.32 | 3.47 | 3.07 | 2.84 | 2.68 | 2.57 | 2.49 | 2.42 | 2.37 | 2.32 |
| 22 | 4.30 | 3.44 | 3.05 | 2.82 | 2.66 | 2.55 | 2.46 | 2.40 | 2.34 | 2.30 |
| 23 | 4.28 | 3.42 | 3.03 | 2.80 | 2.64 | 2.53 | 2.44 | 2.37 | 2.32 | 2.27 |
| 24 | 4.26 | 3.40 | 3.01 | 2.78 | 2.62 | 2.51 | 2.42 | 2.36 | 2.30 | 2.25 |
| 25 | 4.24 | 3.39 | 2.99 | 2.76 | 2.60 | 2.49 | 2.40 | 2.34 | 2.28 | 2.24 |
| 26 | 4.23 | 3.37 | 2.98 | 2.74 | 2.59 | 2.47 | 2.39 | 2.32 | 2.27 | 2.22 |
| 27 | 4.21 | 3.35 | 2.96 | 2.73 | 2.57 | 2.46 | 2.37 | 2.31 | 2.25 | 2.20 |
| 28 | 4.20 | 3.34 | 2.95 | 2.71 | 2.56 | 2.45 | 2.36 | 2.29 | 2.24 | 2.19 |
| 29 | 4.18 | 3.33 | 2.93 | 2.70 | 2.55 | 2.43 | 2.35 | 2.28 | 2.22 | 2.18 |
| 30 | 4.17 | 3.32 | 2.92 | 2.69 | 2.53 | 2.42 | 2.33 | 2.27 | 2.21 | 2.16 |
| 31 | 4.16 | 3.30 | 2.91 | 2.68 | 2.52 | 2.41 | 2.32 | 2.25 | 2.20 | 2.15 |
| 32 | 4.15 | 3.29 | 2.90 | 2.67 | 2.51 | 2.40 | 2.31 | 2.24 | 2.19 | 2.14 |
| 33 | 4.14 | 3.28 | 2.89 | 2.66 | 2.50 | 2.39 | 2.30 | 2.23 | 2.18 | 2.13 |
| 34 | 4.13 | 3.28 | 2.88 | 2.65 | 2.49 | 2.38 | 2.29 | 2.23 | 2.17 | 2.12 |
| 35 | 4.12 | 3.27 | 2.87 | 2.64 | 2.49 | 2.37 | 2.29 | 2.22 | 2.16 | 2.11 |
| 40 | 4.08 | 3.23 | 2.84 | 2.61 | 2.45 | 2.34 | 2.25 | 2.18 | 2.12 | 2.08 |
| 45 | 4.06 | 3.20 | 2.81 | 2.58 | 2.42 | 2.31 | 2.22 | 2.15 | 2.10 | 2.05 |
| 50 | 4.03 | 3.18 | 2.79 | 2.56 | 2.40 | 2.29 | 2.20 | 2.13 | 2.07 | 2.03 |
| 60 | 4.00 | 3.15 | 2.76 | 2.53 | 2.37 | 2.25 | 2.17 | 2.10 | 2.04 | 1.99 |
| 120 | 3.92 | 3.07 | 2.68 | 2.45 | 2.29 | 2.18 | 2.09 | 2.02 | 1.96 | 1.91 |
|  | 3.84 | 3.00 | 2.60 | 2.37 | 2.21 | 2.10 | 2.01 | 1.94 | 1.88 | 1.83 |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *V*  2 | *V*  1 | | | | | | | | | |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 1 | 243.26 | 244.19 | 244.97 | 245.65 | 246.24 | 246.75 | 247.20 | 247.61 | 247.97 | 248.30 |
| 2 | 19.40 | 19.41 | 19.42 | 19.44 | 19.44 | 19.45 | 19.45 | 19.45 | 19.46 | 19.46 |
| 3 | 8.76 | 8.74 | 8.73 | 8.71 | 8.70 | 8.69 | 8.68 | 8.67 | 8.67 | 8.66 |
| 4 | 5.94 | 5.91 | 5.89 | 5.87 | 5.86 | 5.84 | 5.83 | 5.82 | 5.81 | 5.80 |
| 5 | 4.70 | 4.68 | 4.66 | 4.64 | 4.62 | 4.60 | 4.59 | 4.58 | 4.57 | 4.56 |
| 6 | 4.03 | 4.00 | 3.98 | 3.96 | 3.94 | 3.92 | 3.91 | 3.90 | 3.88 | 3.87 |
| 7 | 3.60 | 3.57 | 3.55 | 3.53 | 3.51 | 3.49 | 3.48 | 3.47 | 3.46 | 3.44 |
| 8 | 3.31 | 3.28 | 3.26 | 3.24 | 3.22 | 3.20 | 3.19 | 3.17 | 3.16 | 3.15 |
| 9 | 3.10 | 3.07 | 3.05 | 3.03 | 3.01 | 2.99 | 2.97 | 2.96 | 2.95 | 2.94 |
| 10 | 2.94 | 2.91 | 2.89 | 2.86 | 2.85 | 2.83 | 2.81 | 2.80 | 2.79 | 2.77 |
| 11 | 2.82 | 2.79 | 2.76 | 2.74 | 2.72 | 2.70 | 2.69 | 2.67 | 2.66 | 2.65 |
| 12 | 2.72 | 2.69 | 2.66 | 2.64 | 2.62 | 2.60 | 2.58 | 2.57 | 2.56 | 2.54 |
| 13 | 2.63 | 2.60 | 2.58 | 2.55 | 2.53 | 2.51 | 2.50 | 2.48 | 2.47 | 2.46 |
| 14 | 2.57 | 2.53 | 2.51 | 2.48 | 2.46 | 2.44 | 2.43 | 2.41 | 2.40 | 2.39 |
| 15 | 2.51 | 2.48 | 2.45 | 2.42 | 2.40 | 2.38 | 2.37 | 2.35 | 2.34 | 2.33 |
| 16 | 2.46 | 2.42 | 2.40 | 2.37 | 2.35 | 2.33 | 2.32 | 2.30 | 2.29 | 2.28 |
| 17 | 2.41 | 2.38 | 2.35 | 2.33 | 2.31 | 2.29 | 2.27 | 2.26 | 2.24 | 2.23 |
| 18 | 2.37 | 2.34 | 2.31 | 2.29 | 2.27 | 2.25 | 2.23 | 2.22 | 2.20 | 2.19 |
| 19 | 2.34 | 2.31 | 2.28 | 2.26 | 2.23 | 2.21 | 2.20 | 2.18 | 2.17 | 2.16 |
| 20 | 2.31 | 2.28 | 2.25 | 2.22 | 2.20 | 2.18 | 2.17 | 2.15 | 2.14 | 2.12 |
| 21 | 2.28 | 2.25 | 2.22 | 2.20 | 2.18 | 2.16 | 2.14 | 2.12 | 2.11 | 2.10 |
| 22 | 2.26 | 2.23 | 2.20 | 2.17 | 2.15 | 2.13 | 2.11 | 2.10 | 2.08 | 2.07 |
| 23 | 2.24 | 2.20 | 2.18 | 2.15 | 2.13 | 2.11 | 2.09 | 2.08 | 2.06 | 2.05 |
| 24 | 2.22 | 2.18 | 2.15 | 2.13 | 2.11 | 2.09 | 2.07 | 2.05 | 2.04 | 2.03 |
| 25 | 2.20 | 2.16 | 2.14 | 2.11 | 2.09 | 2.07 | 2.05 | 2.04 | 2.02 | 2.01 |
| 26 | 2.18 | 2.15 | 2.12 | 2.09 | 2.07 | 2.05 | 2.03 | 2.02 | 2.00 | 1.99 |
| 27 | 2.17 | 2.13 | 2.10 | 2.08 | 2.06 | 2.04 | 2.02 | 2.00 | 1.99 | 1.97 |
| 28 | 2.15 | 2.12 | 2.09 | 2.06 | 2.04 | 2.02 | 2.00 | 1.99 | 1.97 | 1.96 |
| 29 | 2.14 | 2.10 | 2.08 | 2.05 | 2.03 | 2.01 | 1.99 | 1.97 | 1.96 | 1.94 |
| 30 | 2.13 | 2.09 | 2.06 | 2.04 | 2.01 | 1.99 | 1.98 | 1.96 | 1.95 | 1.93 |
| 31 | 2.11 | 2.08 | 2.05 | 2.03 | 2.00 | 1.98 | 1.96 | 1.95 | 1.93 | 1.92 |
| 32 | 2.10 | 2.07 | 2.04 | 2.01 | 1.99 | 1.97 | 1.95 | 1.94 | 1.92 | 1.91 |
| 33 | 2.09 | 2.06 | 2.03 | 2.00 | 1.98 | 1.96 | 1.94 | 1.93 | 1.91 | 1.90 |
| 34 | 2.08 | 2.05 | 2.02 | 1.99 | 1.97 | 1.95 | 1.93 | 1.92 | 1.90 | 1.89 |
| 35 | 2.07 | 2.04 | 2.01 | 1.99 | 1.96 | 1.94 | 1.92 | 1.91 | 1.89 | 1.88 |
| 40 | 2.04 | 2.00 | 1.97 | 1.95 | 1.92 | 1.90 | 1.89 | 1.87 | 1.85 | 1.84 |
| 45 | 2.01 | 1.97 | 1.94 | 1.92 | 1.89 | 1.87 | 1.86 | 1.84 | 1.82 | 1.81 |
| 50 | 1.99 | 1.95 | 1.92 | 1.89 | 1.87 | 1.85 | 1.83 | 1.81 | 1.80 | 1.78 |
| 60 | 1.95 | 1.92 | 1.89 | 1.86 | 1.84 | 1.82 | 1.80 | 1.78 | 1.76 | 1.75 |
| 120 | 1.87 | 1.83 | 1.80 | 1.78 | 1.75 | 1.73 | 1.71 | 1.69 | 1.67 | 1.66 |
|  | 1.79 | 1.75 | 1.72 | 1.69 | 1.67 | 1.64 | 1.62 | 1.60 | 1.59 | 1.57 |

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *V*  2 | *V*  1 | | | | | | | | | | |
| 21 | 22 | 23 | 24 | 25 | 30 | 35 | 40 | 60 | 120 |  |
| 1 | 248.60 | 248.87 | 249.11 | 249.34 | 249.55 | 250.39 | 250.98 | 251.44 | 270.27 | 271.40 | 254.31 |
| 2 | 19.46 | 19.46 | 19.47 | 19.47 | 19.47 | 19.48 | 19.48 | 19.49 | 19.49 | 19.50 | 19.50 |
| 3 | 8.65 | 8.65 | 8.64 | 8.64 | 8.63 | 8.62 | 8.60 | 8.59 | 8.57 | 8.55 | 8.53 |
| 4 | 5.79 | 5.79 | 5.78 | 5.77 | 5.77 | 5.75 | 5.73 | 5.72 | 5.69 | 5.66 | 5.63 |
| 5 | 4.55 | 4.54 | 4.53 | 4.53 | 4.52 | 4.50 | 4.48 | 4.46 | 4.43 | 4.40 | 4.36 |
| 6 | 3.86 | 3.86 | 3.85 | 3.84 | 3.83 | 3.81 | 3.79 | 3.77 | 3.74 | 3.70 | 3.67 |
| 7 | 3.43 | 3.43 | 3.42 | 3.41 | 3.40 | 3.38 | 3.36 | 3.34 | 3.30 | 3.27 | 3.23 |
| 8 | 3.14 | 3.13 | 3.12 | 3.12 | 3.11 | 3.08 | 3.06 | 3.04 | 3.01 | 2.97 | 2.93 |
| 9 | 2.93 | 2.92 | 2.91 | 2.90 | 2.89 | 2.86 | 2.84 | 2.83 | 2.79 | 2.75 | 2.71 |
| 10 | 2.76 | 2.75 | 2.75 | 2.74 | 2.73 | 2.70 | 2.68 | 2.66 | 2.62 | 2.58 | 2.54 |
| 11 | 2.64 | 2.63 | 2.62 | 2.61 | 2.60 | 2.57 | 2.55 | 2.53 | 2.49 | 2.45 | 2.40 |
| 12 | 2.53 | 2.52 | 2.51 | 2.51 | 2.50 | 2.47 | 2.44 | 2.43 | 2.38 | 2.34 | 2.30 |
| 13 | 2.45 | 2.44 | 2.43 | 2.42 | 2.41 | 2.38 | 2.36 | 2.34 | 2.30 | 2.25 | 2.21 |
| 14 | 2.38 | 2.37 | 2.36 | 2.35 | 2.34 | 2.31 | 2.28 | 2.27 | 2.22 | 2.18 | 2.13 |
| 15 | 2.32 | 2.31 | 2.30 | 2.29 | 2.28 | 2.25 | 2.22 | 2.20 | 2.16 | 2.11 | 2.07 |
| 16 | 2.26 | 2.25 | 2.24 | 2.24 | 2.23 | 2.19 | 2.17 | 2.15 | 2.11 | 2.06 | 2.01 |
| 17 | 2.22 | 2.21 | 2.20 | 2.19 | 2.18 | 2.15 | 2.12 | 2.10 | 2.06 | 2.01 | 1.96 |
| 18 | 2.18 | 2.17 | 2.16 | 2.15 | 2.14 | 2.11 | 2.08 | 2.06 | 2.02 | 1.97 | 1.92 |
| 19 | 2.14 | 2.13 | 2.12 | 2.11 | 2.11 | 2.07 | 2.05 | 2.03 | 1.98 | 1.93 | 1.88 |
| 20 | 2.11 | 2.10 | 2.09 | 2.08 | 2.07 | 2.04 | 2.01 | 1.99 | 1.95 | 1.90 | 1.84 |
| 21 | 2.08 | 2.07 | 2.06 | 2.05 | 2.05 | 2.01 | 1.98 | 1.96 | 1.92 | 1.87 | 1.81 |
| 22 | 2.06 | 2.05 | 2.04 | 2.03 | 2.02 | 1.98 | 1.96 | 1.94 | 1.89 | 1.84 | 1.78 |
| 23 | 2.04 | 2.02 | 2.01 | 2.01 | 2.00 | 1.96 | 1.93 | 1.91 | 1.86 | 1.81 | 1.76 |
| 24 | 2.01 | 2.00 | 1.99 | 1.98 | 1.97 | 1.94 | 1.91 | 1.89 | 1.84 | 1.79 | 1.73 |
| 25 | 2.00 | 1.98 | 1.97 | 1.96 | 1.96 | 1.92 | 1.89 | 1.87 | 1.82 | 1.77 | 1.71 |
| 26 | 1.98 | 1.97 | 1.96 | 1.95 | 1.94 | 1.90 | 1.87 | 1.85 | 1.80 | 1.75 | 1.69 |
| 27 | 1.96 | 1.95 | 1.94 | 1.93 | 1.92 | 1.88 | 1.86 | 1.84 | 1.79 | 1.73 | 1.67 |
| 28 | 1.95 | 1.93 | 1.92 | 1.91 | 1.91 | 1.87 | 1.84 | 1.82 | 1.77 | 1.71 | 1.65 |
| 29 | 1.93 | 1.92 | 1.91 | 1.90 | 1.89 | 1.85 | 1.83 | 1.81 | 1.75 | 1.70 | 1.64 |
| 30 | 1.92 | 1.91 | 1.90 | 1.89 | 1.88 | 1.84 | 1.81 | 1.79 | 1.74 | 1.68 | 1.62 |
| 31 | 1.91 | 1.90 | 1.88 | 1.88 | 1.87 | 1.83 | 1.80 | 1.78 | 1.73 | 1.67 | 1.61 |
| 32 | 1.90 | 1.88 | 1.87 | 1.86 | 1.85 | 1.82 | 1.79 | 1.77 | 1.71 | 1.66 | 1.59 |
| 33 | 1.89 | 1.87 | 1.86 | 1.85 | 1.84 | 1.81 | 1.78 | 1.76 | 1.70 | 1.64 | 1.58 |
| 34 | 1.88 | 1.86 | 1.85 | 1.84 | 1.83 | 1.80 | 1.77 | 1.75 | 1.69 | 1.63 | 1.57 |
| 35 | 1.87 | 1.85 | 1.84 | 1.83 | 1.82 | 1.79 | 1.76 | 1.74 | 1.68 | 1.62 | 1.56 |
| 40 | 1.83 | 1.81 | 1.80 | 1.79 | 1.78 | 1.74 | 1.72 | 1.69 | 1.64 | 1.58 | 1.51 |
| 45 | 1.80 | 1.78 | 1.77 | 1.76 | 1.75 | 1.71 | 1.68 | 1.66 | 1.60 | 1.54 | 1.47 |
| 50 | 1.77 | 1.76 | 1.75 | 1.74 | 1.73 | 1.69 | 1.66 | 1.63 | 1.58 | 1.51 | 1.44 |
| 60 | 1.73 | 1.72 | 1.71 | 1.70 | 1.69 | 1.65 | 1.62 | 1.59 | 1.53 | 1.47 | 1.39 |
| 120 | 1.64 | 1.63 | 1.62 | 1.61 | 1.60 | 1.55 | 1.52 | 1.50 | 1.43 | 1.35 | 1.25 |
|  | 1.56 | 1.54 | 1.53 | 1.52 | 1.51 | 1.46 | 1.42 | 1.39 | 1.32 | 1.22 | 1.00 |

Table 4: Chi-Squared Distribution

 2  *distribution*

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 0.995 | 0.99 | 0.975 | 0.95 | 0.9 | 0.1 | 0.05 | 0.025 | 0.01 | 0.005 |
| 1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 2.71 | 3.84 | 5.02 | 6.63 | 7.88 |
| 2 | 0.01 | 0.02 | 0.05 | 0.10 | 0.21 | 4.61 | 5.99 | 7.38 | 9.21 | 10.60 |
| 3 | 0.07 | 0.11 | 0.22 | 0.35 | 0.58 | 6.25 | 7.81 | 9.35 | 11.34 | 12.84 |
| 4 | 0.21 | 0.30 | 0.48 | 0.71 | 1.06 | 7.78 | 9.49 | 11.14 | 13.28 | 14.86 |
| 5 | 0.41 | 0.55 | 0.83 | 1.15 | 1.61 | 9.24 | 11.07 | 12.83 | 15.09 | 16.75 |
| 6 | 0.68 | 0.87 | 1.24 | 1.64 | 2.20 | 10.64 | 12.59 | 14.45 | 16.81 | 18.55 |
| 7 | 0.99 | 1.24 | 1.69 | 2.17 | 2.83 | 12.02 | 14.07 | 16.01 | 18.48 | 20.28 |
| 8 | 1.34 | 1.65 | 2.18 | 2.73 | 3.49 | 13.36 | 15.51 | 17.53 | 20.09 | 21.95 |
| 9 | 1.73 | 2.09 | 2.70 | 3.33 | 4.17 | 14.68 | 16.92 | 19.02 | 21.67 | 23.59 |
| 10 | 2.16 | 2.56 | 3.25 | 3.94 | 4.87 | 15.99 | 18.31 | 20.48 | 23.21 | 25.19 |
| 11 | 2.60 | 3.05 | 3.82 | 4.57 | 5.58 | 17.28 | 19.68 | 21.92 | 24.72 | 26.76 |
| 12 | 3.07 | 3.57 | 4.40 | 5.23 | 6.30 | 18.55 | 21.03 | 23.34 | 26.22 | 28.30 |
| 13 | 3.57 | 4.11 | 5.01 | 5.89 | 7.04 | 19.81 | 22.36 | 24.74 | 27.69 | 29.82 |
| 14 | 4.07 | 4.66 | 5.63 | 6.57 | 7.79 | 21.06 | 23.68 | 26.12 | 29.14 | 31.32 |
| 15 | 4.60 | 5.23 | 6.26 | 7.26 | 8.55 | 22.31 | 25.00 | 27.49 | 30.58 | 32.80 |
| 16 | 5.14 | 5.81 | 6.91 | 7.96 | 9.31 | 23.54 | 26.30 | 28.85 | 32.00 | 34.27 |
| 17 | 5.70 | 6.41 | 7.56 | 8.67 | 10.09 | 24.77 | 27.59 | 30.19 | 33.41 | 35.72 |
| 18 | 6.26 | 7.01 | 8.23 | 9.39 | 10.86 | 25.99 | 28.87 | 31.53 | 34.81 | 37.16 |
| 19 | 6.84 | 7.63 | 8.91 | 10.12 | 11.65 | 27.20 | 30.14 | 32.85 | 36.19 | 38.58 |
| 20 | 7.43 | 8.26 | 9.59 | 10.85 | 12.44 | 28.41 | 31.41 | 34.17 | 37.57 | 40.00 |
| 21 | 8.03 | 8.90 | 10.28 | 11.59 | 13.24 | 29.62 | 32.67 | 35.48 | 38.93 | 41.40 |
| 22 | 8.64 | 9.54 | 10.98 | 12.34 | 14.04 | 30.81 | 33.92 | 36.78 | 40.29 | 42.80 |
| 23 | 9.26 | 10.20 | 11.69 | 13.09 | 14.85 | 32.01 | 35.17 | 38.08 | 41.64 | 44.18 |
| 24 | 9.89 | 10.86 | 12.40 | 13.85 | 15.66 | 33.20 | 36.42 | 39.36 | 42.98 | 45.56 |
| 25 | 10.52 | 11.52 | 13.12 | 14.61 | 16.47 | 34.38 | 37.65 | 40.65 | 44.31 | 46.93 |
| 26 | 11.16 | 12.20 | 13.84 | 15.38 | 17.29 | 35.56 | 38.89 | 41.92 | 45.64 | 48.29 |
| 27 | 11.81 | 12.88 | 14.57 | 16.15 | 18.11 | 36.74 | 40.11 | 43.19 | 46.96 | 49.64 |
| 28 | 12.46 | 13.56 | 15.31 | 16.93 | 18.94 | 37.92 | 41.34 | 44.46 | 48.28 | 50.99 |
| 29 | 13.12 | 14.26 | 16.05 | 17.71 | 19.77 | 39.09 | 42.56 | 45.72 | 49.59 | 52.34 |
| 30 | 13.79 | 14.95 | 16.79 | 18.49 | 20.60 | 40.26 | 43.77 | 46.98 | 50.89 | 53.67 |
| 31 | 14.46 | 15.66 | 17.54 | 19.28 | 21.43 | 41.42 | 44.99 | 48.23 | 52.19 | 55.00 |
| 32 | 15.13 | 16.36 | 18.29 | 20.07 | 22.27 | 42.58 | 46.19 | 49.48 | 53.49 | 56.33 |
| 33 | 15.82 | 17.07 | 19.05 | 20.87 | 23.11 | 43.75 | 47.40 | 50.73 | 54.78 | 57.65 |
| 34 | 16.50 | 17.79 | 19.81 | 21.66 | 23.95 | 44.90 | 48.60 | 51.97 | 56.06 | 58.96 |
| 35 | 17.19 | 18.51 | 20.57 | 22.47 | 24.80 | 46.06 | 49.80 | 53.20 | 57.34 | 60.27 |
| 40 | 20.71 | 22.16 | 24.43 | 26.51 | 29.05 | 51.81 | 55.76 | 59.34 | 63.69 | 66.77 |
| 45 | 24.31 | 25.90 | 28.37 | 30.61 | 33.35 | 57.51 | 61.66 | 65.41 | 69.96 | 73.17 |
| 50 | 27.99 | 29.71 | 32.36 | 34.76 | 37.69 | 63.17 | 67.50 | 71.42 | 76.15 | 79.49 |
| 60 | 35.53 | 37.48 | 40.48 | 43.19 | 46.46 | 74.40 | 79.08 | 83.30 | 88.38 | 91.95 |
| 70 | 43.28 | 45.44 | 48.76 | 51.74 | 55.33 | 85.53 | 90.53 | 95.02 | 100.43 | 104.21 |
| 80 | 51.17 | 53.54 | 57.15 | 60.39 | 64.28 | 96.58 | 101.88 | 106.63 | 112.33 | 116.32 |
| 90 | 59.20 | 61.75 | 65.65 | 69.13 | 73.29 | 107.57 | 113.15 | 118.14 | 124.12 | 128.30 |
| 100 | 67.33 | 70.06 | 74.22 | 77.93 | 82.36 | 118.50 | 124.34 | 129.56 | 135.81 | 140.17 |