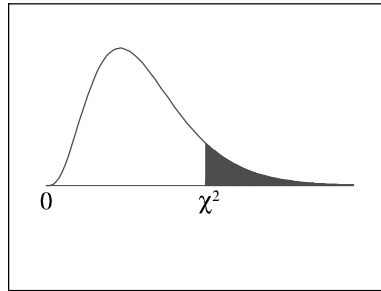


# Chi-Square Distribution Table



The shaded area is equal to  $\alpha$  for  $\chi^2 = \chi^2_{\alpha}$ .

| <i>df</i> | $\chi^2_{.995}$ | $\chi^2_{.990}$ | $\chi^2_{.975}$ | $\chi^2_{.950}$ | $\chi^2_{.900}$ | $\chi^2_{.100}$ | $\chi^2_{.050}$ | $\chi^2_{.025}$ | $\chi^2_{.010}$ | $\chi^2_{.005}$ |
|-----------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 1         | 0.000           | 0.000           | 0.001           | 0.004           | 0.016           | 2.706           | 3.841           | 5.024           | 6.635           | 7.879           |
| 2         | 0.010           | 0.020           | 0.051           | 0.103           | 0.211           | 4.605           | 5.991           | 7.378           | 9.210           | 10.597          |
| 3         | 0.072           | 0.115           | 0.216           | 0.352           | 0.584           | 6.251           | 7.815           | 9.348           | 11.345          | 12.838          |
| 4         | 0.207           | 0.297           | 0.484           | 0.711           | 1.064           | 7.779           | 9.488           | 11.143          | 13.277          | 14.860          |
| 5         | 0.412           | 0.554           | 0.831           | 1.145           | 1.610           | 9.236           | 11.070          | 12.833          | 15.086          | 16.750          |
| 6         | 0.676           | 0.872           | 1.237           | 1.635           | 2.204           | 10.645          | 12.592          | 14.449          | 16.812          | 18.548          |
| 7         | 0.989           | 1.239           | 1.690           | 2.167           | 2.833           | 12.017          | 14.067          | 16.013          | 18.475          | 20.278          |
| 8         | 1.344           | 1.646           | 2.180           | 2.733           | 3.490           | 13.362          | 15.507          | 17.535          | 20.090          | 21.955          |
| 9         | 1.735           | 2.088           | 2.700           | 3.325           | 4.168           | 14.684          | 16.919          | 19.023          | 21.666          | 23.589          |
| 10        | 2.156           | 2.558           | 3.247           | 3.940           | 4.865           | 15.987          | 18.307          | 20.483          | 23.209          | 25.188          |
| 11        | 2.603           | 3.053           | 3.816           | 4.575           | 5.578           | 17.275          | 19.675          | 21.920          | 24.725          | 26.757          |
| 12        | 3.074           | 3.571           | 4.404           | 5.226           | 6.304           | 18.549          | 21.026          | 23.337          | 26.217          | 28.300          |
| 13        | 3.565           | 4.107           | 5.009           | 5.892           | 7.042           | 19.812          | 22.362          | 24.736          | 27.688          | 29.819          |
| 14        | 4.075           | 4.660           | 5.629           | 6.571           | 7.790           | 21.064          | 23.685          | 26.119          | 29.141          | 31.319          |
| 15        | 4.601           | 5.229           | 6.262           | 7.261           | 8.547           | 22.307          | 24.996          | 27.488          | 30.578          | 32.801          |
| 16        | 5.142           | 5.812           | 6.908           | 7.962           | 9.312           | 23.542          | 26.296          | 28.845          | 32.000          | 34.267          |
| 17        | 5.697           | 6.408           | 7.564           | 8.672           | 10.085          | 24.769          | 27.587          | 30.191          | 33.409          | 35.718          |
| 18        | 6.265           | 7.015           | 8.231           | 9.390           | 10.865          | 25.989          | 28.869          | 31.526          | 34.805          | 37.156          |
| 19        | 6.844           | 7.633           | 8.907           | 10.117          | 11.651          | 27.204          | 30.144          | 32.852          | 36.191          | 38.582          |
| 20        | 7.434           | 8.260           | 9.591           | 10.851          | 12.443          | 28.412          | 31.410          | 34.170          | 37.566          | 39.997          |
| 21        | 8.034           | 8.897           | 10.283          | 11.591          | 13.240          | 29.615          | 32.671          | 35.479          | 38.932          | 41.401          |
| 22        | 8.643           | 9.542           | 10.982          | 12.338          | 14.041          | 30.813          | 33.924          | 36.781          | 40.289          | 42.796          |
| 23        | 9.260           | 10.196          | 11.689          | 13.091          | 14.848          | 32.007          | 35.172          | 38.076          | 41.638          | 44.181          |
| 24        | 9.886           | 10.856          | 12.401          | 13.848          | 15.659          | 33.196          | 36.415          | 39.364          | 42.980          | 45.559          |
| 25        | 10.520          | 11.524          | 13.120          | 14.611          | 16.473          | 34.382          | 37.652          | 40.646          | 44.314          | 46.928          |
| 26        | 11.160          | 12.198          | 13.844          | 15.379          | 17.292          | 35.563          | 38.885          | 41.923          | 45.642          | 48.290          |
| 27        | 11.808          | 12.879          | 14.573          | 16.151          | 18.114          | 36.741          | 40.113          | 43.195          | 46.963          | 49.645          |
| 28        | 12.461          | 13.565          | 15.308          | 16.928          | 18.939          | 37.916          | 41.337          | 44.461          | 48.278          | 50.993          |
| 29        | 13.121          | 14.256          | 16.047          | 17.708          | 19.768          | 39.087          | 42.557          | 45.722          | 49.588          | 52.336          |
| 30        | 13.787          | 14.953          | 16.791          | 18.493          | 20.599          | 40.256          | 43.773          | 46.979          | 50.892          | 53.672          |
| 40        | 20.707          | 22.164          | 24.433          | 26.509          | 29.051          | 51.805          | 55.758          | 59.342          | 63.691          | 66.766          |
| 50        | 27.991          | 29.707          | 32.357          | 34.764          | 37.689          | 63.167          | 67.505          | 71.420          | 76.154          | 79.490          |
| 60        | 35.534          | 37.485          | 40.482          | 43.188          | 46.459          | 74.397          | 79.082          | 83.298          | 88.379          | 91.952          |
| 70        | 43.275          | 45.442          | 48.758          | 51.739          | 55.329          | 85.527          | 90.531          | 95.023          | 100.425         | 104.215         |
| 80        | 51.172          | 53.540          | 57.153          | 60.391          | 64.278          | 96.578          | 101.879         | 106.629         | 112.329         | 116.321         |
| 90        | 59.196          | 61.754          | 65.647          | 69.126          | 73.291          | 107.565         | 113.145         | 118.136         | 124.116         | 128.299         |
| 100       | 67.328          | 70.065          | 74.222          | 77.929          | 82.358          | 118.498         | 124.342         | 129.561         | 135.807         | 140.169         |