

TABLE A2 Values of  $\chi^2_{\alpha,n}$ 

| $n$ | $\alpha = .995$ | $\alpha = .99$ | $\alpha = .975$ | $\alpha = .95$ | $\alpha = .05$ | $\alpha = .025$ | $\alpha = .01$ | $\alpha = .005$ |
|-----|-----------------|----------------|-----------------|----------------|----------------|-----------------|----------------|-----------------|
| 1   | .0000393        | .000157        | .000982         | .00393         | 3.841          | 5.024           | 6.635          | 7.879           |
| 2   | .0100           | .0201          | .0506           | .103           | 5.991          | 7.378           | 9.210          | 10.597          |
| 3   | .0717           | .115           | .216            | .352           | 7.815          | 9.348           | 11.345         | 12.838          |
| 4   | .207            | .297           | .484            | .711           | 9.488          | 11.143          | 13.277         | 14.860          |
| 5   | .412            | .554           | .831            | 1.145          | 11.070         | 12.832          | 13.086         | 16.750          |
| 6   | .676            | .872           | 1.237           | 1.635          | 12.592         | 14.449          | 16.812         | 18.548          |
| 7   | .989            | 1.239          | 1.690           | 2.167          | 14.067         | 16.013          | 18.475         | 20.278          |
| 8   | 1.344           | 1.646          | 2.180           | 2.733          | 15.507         | 17.535          | 20.090         | 21.955          |
| 9   | 1.735           | 2.088          | 2.700           | 3.325          | 16.919         | 19.023          | 21.666         | 23.589          |
| 10  | 2.156           | 2.558          | 3.247           | 3.940          | 18.307         | 20.483          | 23.209         | 25.188          |
| 11  | 2.603           | 3.053          | 3.816           | 4.575          | 19.675         | 21.920          | 24.725         | 26.757          |
| 12  | 3.074           | 3.571          | 4.404           | 5.226          | 21.026         | 23.337          | 26.217         | 28.300          |
| 13  | 3.565           | 4.107          | 5.009           | 5.892          | 22.362         | 24.736          | 27.688         | 29.819          |
| 14  | 4.075           | 4.660          | 5.629           | 6.571          | 23.685         | 26.119          | 29.141         | 31.319          |
| 15  | 4.601           | 5.229          | 6.262           | 7.261          | 24.996         | 27.488          | 30.578         | 32.801          |
| 16  | 5.142           | 5.812          | 6.908           | 7.962          | 26.296         | 28.845          | 32.000         | 34.267          |
| 17  | 5.697           | 6.408          | 7.564           | 8.672          | 27.587         | 30.191          | 33.409         | 35.718          |
| 18  | 6.265           | 7.015          | 8.231           | 9.390          | 28.869         | 31.526          | 34.805         | 37.156          |
| 19  | 6.844           | 7.633          | 8.907           | 10.117         | 30.144         | 32.852          | 36.191         | 38.582          |
| 20  | 7.434           | 8.260          | 9.591           | 10.851         | 31.410         | 34.170          | 37.566         | 39.997          |
| 21  | 8.034           | 8.897          | 10.283          | 11.591         | 32.671         | 35.479          | 38.932         | 41.401          |
| 22  | 8.643           | 9.542          | 10.982          | 12.338         | 33.924         | 36.781          | 40.289         | 42.796          |
| 23  | 9.260           | 10.196         | 11.689          | 13.091         | 35.172         | 38.076          | 41.638         | 44.181          |
| 24  | 9.886           | 10.856         | 12.401          | 13.844         | 36.415         | 39.364          | 42.980         | 45.558          |
| 25  | 10.520          | 11.524         | 13.120          | 14.611         | 37.652         | 40.646          | 44.314         | 46.928          |
| 26  | 11.160          | 12.198         | 13.844          | 15.379         | 38.885         | 41.923          | 45.642         | 48.290          |
| 27  | 11.808          | 12.879         | 14.573          | 16.151         | 40.113         | 43.194          | 46.963         | 49.645          |
| 28  | 12.461          | 13.565         | 15.308          | 16.928         | 41.337         | 44.461          | 48.278         | 50.993          |
| 29  | 13.121          | 14.256         | 16.047          | 17.708         | 42.557         | 45.772          | 49.588         | 52.336          |
| 30  | 13.787          | 14.953         | 16.791          | 18.493         | 43.773         | 46.979          | 50.892         | 53.672          |

Other chi-square probabilities:

$$\chi^2_{9,9} = 4.2 \quad P\{\chi^2_{16} < 14.3\} = .425 \quad P\{\chi^2_{11} < 17.1875\} = .8976.$$