

Critical Values of t-Distribution

The table shows the critical t-values for a given alpha level (one-tailed or two-tailed) and degrees of freedom. The degrees of freedom are the rows.

| Area in Two Tails | | | | | | | |
|-------------------|--------|--------|--------|--------|--------|---------|---------|
| d.f. | 0.2000 | 0.1000 | 0.0500 | 0.0200 | 0.0100 | 0.0020 | 0.0010 |
| Area in One Tail | | | | | | | |
| d.f. | 0.1000 | 0.0500 | 0.0250 | 0.0100 | 0.0050 | 0.0010 | 0.0005 |
| 1 | 3.078 | 6.314 | 12.706 | 31.821 | 63.657 | 318.309 | 636.619 |
| 2 | 1.886 | 2.920 | 4.303 | 6.965 | 9.925 | 22.327 | 31.599 |
| 3 | 1.638 | 2.353 | 3.182 | 4.541 | 5.841 | 10.215 | 12.924 |
| 4 | 1.533 | 2.132 | 2.776 | 3.747 | 4.604 | 7.173 | 8.610 |
| 5 | 1.476 | 2.015 | 2.571 | 3.365 | 4.032 | 5.893 | 6.869 |
| 6 | 1.440 | 1.943 | 2.447 | 3.143 | 3.707 | 5.208 | 5.959 |
| 7 | 1.415 | 1.895 | 2.365 | 2.998 | 3.499 | 4.785 | 5.408 |
| 8 | 1.397 | 1.860 | 2.306 | 2.896 | 3.355 | 4.501 | 5.041 |
| 9 | 1.383 | 1.833 | 2.262 | 2.821 | 3.250 | 4.297 | 4.781 |
| 10 | 1.372 | 1.812 | 2.228 | 2.764 | 3.169 | 4.144 | 4.587 |
| 11 | 1.363 | 1.796 | 2.201 | 2.718 | 3.106 | 4.025 | 4.437 |
| 12 | 1.356 | 1.782 | 2.179 | 2.681 | 3.055 | 3.930 | 4.318 |
| 13 | 1.350 | 1.771 | 2.160 | 2.650 | 3.012 | 3.852 | 4.221 |
| 14 | 1.345 | 1.761 | 2.145 | 2.624 | 2.977 | 3.787 | 4.140 |
| 15 | 1.341 | 1.753 | 2.131 | 2.602 | 2.947 | 3.733 | 4.073 |
| 16 | 1.337 | 1.746 | 2.120 | 2.583 | 2.921 | 3.686 | 4.015 |
| 17 | 1.333 | 1.740 | 2.110 | 2.567 | 2.898 | 3.646 | 3.965 |
| 18 | 1.330 | 1.734 | 2.101 | 2.552 | 2.878 | 3.610 | 3.922 |
| 19 | 1.328 | 1.729 | 2.093 | 2.539 | 2.861 | 3.579 | 3.883 |
| 20 | 1.325 | 1.725 | 2.086 | 2.528 | 2.845 | 3.552 | 3.850 |
| 21 | 1.323 | 1.721 | 2.080 | 2.518 | 2.831 | 3.527 | 3.819 |
| 22 | 1.321 | 1.717 | 2.074 | 2.508 | 2.819 | 3.505 | 3.792 |
| 23 | 1.319 | 1.714 | 2.069 | 2.500 | 2.807 | 3.485 | 3.768 |
| 24 | 1.318 | 1.711 | 2.064 | 2.492 | 2.797 | 3.467 | 3.745 |
| 25 | 1.316 | 1.708 | 2.060 | 2.485 | 2.787 | 3.450 | 3.725 |
| 26 | 1.315 | 1.706 | 2.056 | 2.479 | 2.779 | 3.435 | 3.707 |
| 27 | 1.314 | 1.703 | 2.052 | 2.473 | 2.771 | 3.421 | 3.690 |
| 28 | 1.313 | 1.701 | 2.048 | 2.467 | 2.763 | 3.408 | 3.674 |
| 29 | 1.311 | 1.699 | 2.045 | 2.462 | 2.756 | 3.396 | 3.659 |
| 30 | 1.310 | 1.697 | 2.042 | 2.457 | 2.750 | 3.385 | 3.646 |
| 31 | 1.309 | 1.696 | 2.040 | 2.453 | 2.744 | 3.375 | 3.633 |
| 32 | 1.309 | 1.694 | 2.037 | 2.449 | 2.738 | 3.365 | 3.622 |
| 33 | 1.308 | 1.692 | 2.035 | 2.445 | 2.733 | 3.356 | 3.611 |
| 34 | 1.307 | 1.691 | 2.032 | 2.441 | 2.728 | 3.348 | 3.601 |
| 35 | 1.306 | 1.690 | 2.030 | 2.438 | 2.724 | 3.340 | 3.591 |
| 36 | 1.306 | 1.688 | 2.028 | 2.434 | 2.719 | 3.333 | 3.582 |
| 37 | 1.305 | 1.687 | 2.026 | 2.431 | 2.715 | 3.326 | 3.574 |
| 38 | 1.304 | 1.686 | 2.024 | 2.429 | 2.712 | 3.319 | 3.566 |
| 39 | 1.304 | 1.685 | 2.023 | 2.426 | 2.708 | 3.313 | 3.558 |
| 40 | 1.303 | 1.684 | 2.021 | 2.423 | 2.704 | 3.307 | 3.551 |
| 41 | 1.303 | 1.683 | 2.020 | 2.421 | 2.701 | 3.301 | 3.544 |
| 42 | 1.302 | 1.682 | 2.018 | 2.418 | 2.698 | 3.296 | 3.538 |
| 43 | 1.302 | 1.681 | 2.017 | 2.416 | 2.695 | 3.291 | 3.532 |
| 44 | 1.301 | 1.680 | 2.015 | 2.414 | 2.692 | 3.286 | 3.526 |
| 45 | 1.301 | 1.679 | 2.014 | 2.412 | 2.690 | 3.281 | 3.520 |
| 46 | 1.300 | 1.679 | 2.013 | 2.410 | 2.687 | 3.277 | 3.515 |
| 47 | 1.300 | 1.678 | 2.012 | 2.408 | 2.685 | 3.273 | 3.510 |
| 48 | 1.299 | 1.677 | 2.011 | 2.407 | 2.682 | 3.269 | 3.505 |
| 49 | 1.299 | 1.677 | 2.010 | 2.405 | 2.680 | 3.265 | 3.500 |
| 50 | 1.299 | 1.676 | 2.009 | 2.403 | 2.678 | 3.261 | 3.496 |
| Infinity | 1.282 | 1.645 | 1.960 | 2.326 | 2.576 | 3.090 | 3.291 |

| Area in Two Tails | | | | | | | |
|-------------------|--------|--------|--------|--------|--------|--------|--------|
| d.f. | 0.2000 | 0.1000 | 0.0500 | 0.0200 | 0.0100 | 0.0020 | 0.0010 |
| Area in One Tail | | | | | | | |
| d.f. | 0.1000 | 0.0500 | 0.0250 | 0.0100 | 0.0050 | 0.0010 | 0.0005 |
| 51 | 1.298 | 1.675 | 2.008 | 2.402 | 2.676 | 3.258 | 3.492 |
| 52 | 1.298 | 1.675 | 2.007 | 2.400 | 2.674 | 3.255 | 3.488 |
| 53 | 1.298 | 1.674 | 2.006 | 2.399 | 2.672 | 3.251 | 3.484 |
| 54 | 1.297 | 1.674 | 2.005 | 2.397 | 2.670 | 3.248 | 3.480 |
| 55 | 1.297 | 1.673 | 2.004 | 2.396 | 2.668 | 3.245 | 3.476 |
| 56 | 1.297 | 1.673 | 2.003 | 2.395 | 2.667 | 3.242 | 3.473 |
| 57 | 1.297 | 1.672 | 2.002 | 2.394 | 2.665 | 3.239 | 3.470 |
| 58 | 1.296 | 1.672 | 2.002 | 2.392 | 2.663 | 3.237 | 3.466 |
| 59 | 1.296 | 1.671 | 2.001 | 2.391 | 2.662 | 3.234 | 3.463 |
| 60 | 1.296 | 1.671 | 2.000 | 2.390 | 2.660 | 3.232 | 3.460 |
| 61 | 1.296 | 1.670 | 2.000 | 2.389 | 2.659 | 3.229 | 3.457 |
| 62 | 1.295 | 1.670 | 1.999 | 2.388 | 2.657 | 3.227 | 3.454 |
| 63 | 1.295 | 1.669 | 1.998 | 2.387 | 2.656 | 3.225 | 3.452 |
| 64 | 1.295 | 1.669 | 1.998 | 2.386 | 2.655 | 3.223 | 3.449 |
| 65 | 1.295 | 1.669 | 1.997 | 2.385 | 2.654 | 3.220 | 3.447 |
| 66 | 1.295 | 1.668 | 1.997 | 2.384 | 2.652 | 3.218 | 3.444 |
| 67 | 1.294 | 1.668 | 1.996 | 2.383 | 2.651 | 3.216 | 3.442 |
| 68 | 1.294 | 1.668 | 1.995 | 2.382 | 2.650 | 3.214 | 3.439 |
| 69 | 1.294 | 1.667 | 1.995 | 2.382 | 2.649 | 3.213 | 3.437 |
| 70 | 1.294 | 1.667 | 1.994 | 2.381 | 2.648 | 3.211 | 3.435 |
| 71 | 1.294 | 1.667 | 1.994 | 2.380 | 2.647 | 3.209 | 3.433 |
| 72 | 1.293 | 1.666 | 1.993 | 2.379 | 2.646 | 3.207 | 3.431 |
| 73 | 1.293 | 1.666 | 1.993 | 2.379 | 2.645 | 3.206 | 3.429 |
| 74 | 1.293 | 1.666 | 1.993 | 2.378 | 2.644 | 3.204 | 3.427 |
| 75 | 1.293 | 1.665 | 1.992 | 2.377 | 2.643 | 3.202 | 3.425 |
| 76 | 1.293 | 1.665 | 1.992 | 2.376 | 2.642 | 3.201 | 3.423 |
| 77 | 1.293 | 1.665 | 1.991 | 2.376 | 2.641 | 3.199 | 3.421 |
| 78 | 1.292 | 1.665 | 1.991 | 2.375 | 2.640 | 3.198 | 3.420 |
| 79 | 1.292 | 1.664 | 1.990 | 2.374 | 2.640 | 3.197 | 3.418 |
| 80 | 1.292 | 1.664 | 1.990 | 2.374 | 2.639 | 3.195 | 3.416 |
| 81 | 1.292 | 1.664 | 1.990 | 2.373 | 2.638 | 3.194 | 3.415 |
| 82 | 1.292 | 1.664 | 1.989 | 2.373 | 2.637 | 3.193 | 3.413 |
| 83 | 1.292 | 1.663 | 1.989 | 2.372 | 2.636 | 3.191 | 3.412 |
| 84 | 1.292 | 1.663 | 1.989 | 2.372 | 2.636 | 3.190 | 3.410 |
| 85 | 1.292 | 1.663 | 1.988 | 2.371 | 2.635 | 3.189 | 3.409 |
| 86 | 1.291 | 1.663 | 1.988 | 2.370 | 2.634 | 3.188 | 3.407 |
| 87 | 1.291 | 1.663 | 1.988 | 2.370 | 2.634 | 3.187 | 3.406 |
| 88 | 1.291 | 1.662 | 1.987 | 2.369 | 2.633 | 3.185 | 3.405 |
| 89 | 1.291 | 1.662 | 1.987 | 2.369 | 2.632 | 3.184 | 3.403 |
| 90 | 1.291 | 1.662 | 1.987 | 2.368 | 2.632 | 3.183 | 3.402 |
| 91 | 1.291 | 1.662 | 1.986 | 2.368 | 2.631 | 3.182 | 3.401 |
| 92 | 1.291 | 1.662 | 1.986 | 2.368 | 2.630 | 3.181 | 3.399 |
| 93 | 1.291 | 1.661 | 1.986 | 2.367 | 2.630 | 3.180 | 3.398 |
| 94 | 1.291 | 1.661 | 1.986 | 2.367 | 2.629 | 3.179 | 3.397 |
| 95 | 1.291 | 1.661 | 1.985 | 2.366 | 2.629 | 3.178 | 3.396 |
| 96 | 1.290 | 1.661 | 1.985 | 2.366 | 2.628 | 3.177 | 3.395 |
| 97 | 1.290 | 1.661 | 1.985 | 2.365 | 2.627 | 3.176 | 3.394 |
| 98 | 1.290 | 1.661 | 1.984 | 2.365 | 2.627 | 3.175 | 3.393 |
| 99 | 1.290 | 1.660 | 1.984 | 2.365 | 2.626 | 3.175 | 3.392 |
| 100 | 1.290 | 1.660 | 1.984 | 2.364 | 2.626 | 3.174 | 3.390 |
| 110 | 1.289 | 1.659 | 1.982 | 2.361 | 2.621 | 3.166 | 3.381 |
| 120 | 1.289 | 1.658 | 1.980 | 2.358 | 2.617 | 3.160 | 3.373 |
| 130 | 1.288 | 1.657 | 1.978 | 2.355 | 2.614 | 3.154 | 3.367 |
| 140 | 1.288 | 1.656 | 1.977 | 2.353 | 2.611 | 3.149 | 3.361 |
| 150 | 1.287 | 1.655 | 1.976 | 2.351 | 2.609 | 3.145 | 3.357 |
| Infinity | 1.282 | 1.645 | 1.960 | 2.326 | 2.576 | 3.090 | 3.291 |