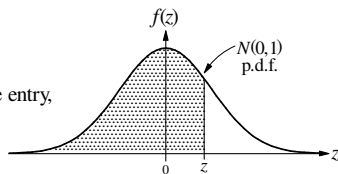


**Figure 2.11. PROBABILITIES FOR THE STANDARD NORMAL DISTRIBUTION  $[N(0, 1)]$  – 4,5 figure**

**IN THE MAIN UPPER TABLE:**

$\Pr[-\infty < N(0, 1) \leq z\text{-value from table margins}] = \text{Table entry,}$   
 e.g.,  $\Pr[-\infty < N(0, 1) \leq 0.00] = 0.5000^0 = 0.5;$



**Notation:**

$F(0.01) = .5040^{-1} = 0.50399$   
 $F(0.05) = .5199^4 = 0.51994$   
 $F(2.33) = .9^2 0097 = 0.990097,$  { where  $F(z)$  is the  $N(0, 1)$  c.d.f.:  

$$F(z) = \int_{-\infty}^z f(t) dt = \int_{-\infty}^z \frac{1}{\sqrt{2\pi}} e^{-t^2/2} dt.$$

**THE SMALLER LOWER TABLE** provides more accurate and convenient inverse lookup for selected probabilities in the interval 0.5 to 0.999 9995.

| z   | .00                     | .01                  | .02                  | .03                  | .04                  | .05                  | .06                  | .07                  | .08                  | .09                  |
|-----|-------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| 0.0 | .5000 <sup>0</sup>      | .5040 <sup>-1</sup>  | .5080 <sup>-2</sup>  | .5120 <sup>-3</sup>  | .5160 <sup>-5</sup>  | .5199 <sup>4</sup>   | .5239 <sup>2</sup>   | .5279 <sup>0</sup>   | .5319 <sup>-2</sup>  | .5359 <sup>-4</sup>  |
| 0.1 | .5398 <sup>3</sup>      | .5438 <sup>0</sup>   | .5478 <sup>-4</sup>  | .5517 <sup>-2</sup>  | .5557 <sup>-3</sup>  | .5596 <sup>2</sup>   | .5636 <sup>-4</sup>  | .5675 <sup>-1</sup>  | .5714 <sup>2</sup>   | .5753 <sup>5</sup>   |
| 0.2 | .5793 <sup>-4</sup>     | .5832 <sup>-3</sup>  | .5871 <sup>-4</sup>  | .5910 <sup>-5</sup>  | .5948 <sup>3</sup>   | .5987 <sup>1</sup>   | .6026 <sup>-3</sup>  | .6064 <sup>2</sup>   | .6103 <sup>-4</sup>  | .6141 <sup>-1</sup>  |
| 0.3 | .6179 <sup>1</sup>      | .6217 <sup>2</sup>   | .6255 <sup>-2</sup>  | .6293 <sup>0</sup>   | .6331 <sup>-3</sup>  | .6368 <sup>3</sup>   | .6406 <sup>-2</sup>  | .6443 <sup>1</sup>   | .6480 <sup>3</sup>   | .6517 <sup>3</sup>   |
| 0.4 | .6554 <sup>2</sup>      | .6591 <sup>0</sup>   | .6628 <sup>-4</sup>  | .6664 <sup>0</sup>   | .6700 <sup>3</sup>   | .6736 <sup>4</sup>   | .6772 <sup>4</sup>   | .6808 <sup>2</sup>   | .6844 <sup>-1</sup>  | .6879 <sup>3</sup>   |
| 0.5 | .6915 <sup>-4</sup>     | .6950 <sup>-3</sup>  | .6985 <sup>-3</sup>  | .7019 <sup>4</sup>   | .7054 <sup>0</sup>   | .7088 <sup>4</sup>   | .7123 <sup>-4</sup>  | .7157 <sup>-4</sup>  | .7190 <sup>4</sup>   | .7224 <sup>0</sup>   |
| 0.6 | .7257 <sup>5</sup>      | .7291 <sup>-3</sup>  | .7324 <sup>-3</sup>  | .7357 <sup>-5</sup>  | .7389 <sup>1</sup>   | .7422 <sup>-5</sup>  | .7454 <sup>-3</sup>  | .7486 <sup>-3</sup>  | .7517 <sup>5</sup>   | .7549 <sup>0</sup>   |
| 0.7 | .7580 <sup>4</sup>      | .7611 <sup>5</sup>   | .7642 <sup>4</sup>   | .7673 <sup>0</sup>   | .7704 <sup>-5</sup>  | .7734 <sup>-3</sup>  | .7764 <sup>-3</sup>  | .7794 <sup>-5</sup>  | .7823 <sup>0</sup>   | .7852 <sup>4</sup>   |
| 0.8 | .7881 <sup>4</sup>      | .7910 <sup>3</sup>   | .7939 <sup>-1</sup>  | .7967 <sup>3</sup>   | .7995 <sup>5</sup>   | .8023 <sup>4</sup>   | .8051 <sup>1</sup>   | .8078 <sup>5</sup>   | .8106 <sup>-3</sup>  | .8133 <sup>-3</sup>  |
| 0.9 | .8159 <sup>4</sup>      | .8186 <sup>-1</sup>  | .8212 <sup>1</sup>   | .8238 <sup>1</sup>   | .8264 <sup>-1</sup>  | .8289 <sup>4</sup>   | .8315 <sup>-3</sup>  | .8340 <sup>-2</sup>  | .8365 <sup>-4</sup>  | .8389 <sup>1</sup>   |
| 1.0 | .8413 <sup>4</sup>      | .8438 <sup>-5</sup>  | .8461 <sup>4</sup>   | .8485 <sup>-1</sup>  | .8508 <sup>3</sup>   | .8531 <sup>4</sup>   | .8554 <sup>3</sup>   | .8577 <sup>-1</sup>  | .8599 <sup>3</sup>   | .8621 <sup>4</sup>   |
| 1.1 | .8643 <sup>3</sup>      | .8665 <sup>0</sup>   | .8686 <sup>4</sup>   | .8708 <sup>-4</sup>  | .8729 <sup>-4</sup>  | .8749 <sup>3</sup>   | .8770 <sup>-2</sup>  | .8790 <sup>0</sup>   | .8810 <sup>0</sup>   | .8830 <sup>-2</sup>  |
| 1.2 | .8849 <sup>3</sup>      | .8869 <sup>-4</sup>  | .8888 <sup>-3</sup>  | .8907 <sup>-5</sup>  | .8925 <sup>1</sup>   | .8944 <sup>-5</sup>  | .8962 <sup>-3</sup>  | .8980 <sup>-4</sup>  | .8997 <sup>3</sup>   | .9015 <sup>-3</sup>  |
| 1.3 | .9032 <sup>0</sup>      | .9049 <sup>0</sup>   | .9066 <sup>-2</sup>  | .9082 <sup>4</sup>   | .9099 <sup>-2</sup>  | .9115 <sup>-1</sup>  | .9131 <sup>-1</sup>  | .9147 <sup>-4</sup>  | .9162 <sup>1</sup>   | .9177 <sup>4</sup>   |
| 1.4 | .9192 <sup>4</sup>      | .9207 <sup>3</sup>   | .9222 <sup>0</sup>   | .9236 <sup>4</sup>   | .9251 <sup>-3</sup>  | .9265 <sup>-3</sup>  | .9279 <sup>-5</sup>  | .9292 <sup>2</sup>   | .9306 <sup>-4</sup>  | .9319 <sup>-1</sup>  |
| 1.5 | .9332 <sup>-1</sup>     | .9345 <sup>-2</sup>  | .9357 <sup>4</sup>   | .9370 <sup>-1</sup>  | .9382 <sup>2</sup>   | .9394 <sup>3</sup>   | .9406 <sup>2</sup>   | .9418 <sup>-1</sup>  | .9429 <sup>5</sup>   | .9441 <sup>-2</sup>  |
| 1.6 | .9452 <sup>0</sup>      | .9463 <sup>0</sup>   | .9474 <sup>-2</sup>  | .9484 <sup>5</sup>   | .9495 <sup>0</sup>   | .9505 <sup>3</sup>   | .9515 <sup>4</sup>   | .9525 <sup>4</sup>   | .9535 <sup>2</sup>   | .9545 <sup>-1</sup>  |
| 1.7 | .9554 <sup>3</sup>      | .9564 <sup>-3</sup>  | .9573 <sup>-2</sup>  | .9582 <sup>-2</sup>  | .9591 <sup>-3</sup>  | .9599 <sup>4</sup>   | .9608 <sup>0</sup>   | .9616 <sup>4</sup>   | .9625 <sup>-4</sup>  | .9633 <sup>-3</sup>  |
| 1.8 | .9641 <sup>-3</sup>     | .9649 <sup>-5</sup>  | .9656 <sup>-2</sup>  | .9664 <sup>-2</sup>  | .9671 <sup>2</sup>   | .9678 <sup>4</sup>   | .9686 <sup>-4</sup>  | .9693 <sup>-4</sup>  | .9699 <sup>5</sup>   | .9706 <sup>2</sup>   |
| 1.9 | .9713 <sup>-2</sup>     | .9719 <sup>3</sup>   | .9726 <sup>-3</sup>  | .9732 <sup>0</sup>   | .9738 <sup>1</sup>   | .9744 <sup>1</sup>   | .9750 <sup>0</sup>   | .9756 <sup>-2</sup>  | .9761 <sup>5</sup>   | .9767 <sup>0</sup>   |
| 2.0 | .9772 <sup>5</sup>      | .9778 <sup>-2</sup>  | .9783 <sup>1</sup>   | .9788 <sup>2</sup>   | .9793 <sup>2</sup>   | .9798 <sup>2</sup>   | .9803 <sup>0</sup>   | .9808 <sup>-3</sup>  | .9812 <sup>4</sup>   | .9817 <sup>-1</sup>  |
| 2.1 | .9821 <sup>4</sup>      | .9826 <sup>-3</sup>  | .9830 <sup>0</sup>   | .9834 <sup>1</sup>   | .9838 <sup>2</sup>   | .9842 <sup>2</sup>   | .9846 <sup>1</sup>   | .9850 <sup>0</sup>   | .9854 <sup>-3</sup>  | .9857 <sup>4</sup>   |
| 2.2 | .9861 <sup>0</sup>      | .9864 <sup>5</sup>   | .9868 <sup>-1</sup>  | .9871 <sup>3</sup>   | .9875 <sup>-5</sup>  | .9878 <sup>-2</sup>  | .9881 <sup>-1</sup>  | .9884 <sup>0</sup>   | .9887 <sup>0</sup>   | .9890 <sup>-1</sup>  |
| 2.3 | .9893 <sup>-2</sup>     | .9896 <sup>-4</sup>  | .9898 <sup>3</sup>   | .9 <sup>2</sup> 0097 | .9 <sup>2</sup> 0358 | .9 <sup>2</sup> 0613 | .9 <sup>2</sup> 0863 | .9 <sup>2</sup> 1106 | .9 <sup>2</sup> 1344 | .9 <sup>2</sup> 1576 |
| 2.4 | .9 <sup>2</sup> 1802    | .9 <sup>2</sup> 2024 | .9 <sup>2</sup> 2240 | .9 <sup>2</sup> 2451 | .9 <sup>2</sup> 2656 | .9 <sup>2</sup> 2857 | .9 <sup>2</sup> 3053 | .9 <sup>2</sup> 3244 | .9 <sup>2</sup> 3431 | .9 <sup>2</sup> 3613 |
| 2.5 | .9 <sup>2</sup> 3790    | .9 <sup>2</sup> 3963 | .9 <sup>2</sup> 4132 | .9 <sup>2</sup> 4297 | .9 <sup>2</sup> 4457 | .9 <sup>2</sup> 4614 | .9 <sup>2</sup> 4766 | .9 <sup>2</sup> 4915 | .9 <sup>2</sup> 5060 | .9 <sup>2</sup> 5201 |
| 2.6 | .9 <sup>2</sup> 5339    | .9 <sup>2</sup> 5473 | .9 <sup>2</sup> 5604 | .9 <sup>2</sup> 5731 | .9 <sup>2</sup> 5855 | .9 <sup>2</sup> 5975 | .9 <sup>2</sup> 6093 | .9 <sup>2</sup> 6207 | .9 <sup>2</sup> 6319 | .9 <sup>2</sup> 6427 |
| 2.7 | .9 <sup>2</sup> 6533    | .9 <sup>2</sup> 6636 | .9 <sup>2</sup> 6736 | .9 <sup>2</sup> 6833 | .9 <sup>2</sup> 6928 | .9 <sup>2</sup> 7020 | .9 <sup>2</sup> 7110 | .9 <sup>2</sup> 7197 | .9 <sup>2</sup> 7282 | .9 <sup>2</sup> 7365 |
| 2.8 | .9 <sup>2</sup> 7445    | .9 <sup>2</sup> 7523 | .9 <sup>2</sup> 7599 | .9 <sup>2</sup> 7673 | .9 <sup>2</sup> 7744 | .9 <sup>2</sup> 7814 | .9 <sup>2</sup> 7882 | .9 <sup>2</sup> 7948 | .9 <sup>2</sup> 8012 | .9 <sup>2</sup> 8074 |
| 2.9 | .9 <sup>2</sup> 8134    | .9 <sup>2</sup> 8193 | .9 <sup>2</sup> 8250 | .9 <sup>2</sup> 8305 | .9 <sup>2</sup> 8359 | .9 <sup>2</sup> 8411 | .9 <sup>2</sup> 8462 | .9 <sup>2</sup> 8511 | .9 <sup>2</sup> 8559 | .9 <sup>2</sup> 8605 |
| 3.0 | .9 <sup>2</sup> 8650    | .9 <sup>2</sup> 8694 | .9 <sup>2</sup> 8736 | .9 <sup>2</sup> 8777 | .9 <sup>2</sup> 8817 | .9 <sup>2</sup> 8856 | .9 <sup>2</sup> 8893 | .9 <sup>2</sup> 8930 | .9 <sup>2</sup> 8965 | .9 <sup>2</sup> 8999 |
| 3.1 | .9 <sup>3</sup> 0324    | .9 <sup>3</sup> 0646 | .9 <sup>3</sup> 0957 | .9 <sup>3</sup> 1260 | .9 <sup>3</sup> 1553 | .9 <sup>3</sup> 1836 | .9 <sup>3</sup> 2112 | .9 <sup>3</sup> 2378 | .9 <sup>3</sup> 2636 | .9 <sup>3</sup> 2886 |
| 3.2 | .9 <sup>3</sup> 3129    | .9 <sup>3</sup> 3363 | .9 <sup>3</sup> 3590 | .9 <sup>3</sup> 3810 | .9 <sup>3</sup> 4024 | .9 <sup>3</sup> 4230 | .9 <sup>3</sup> 4429 | .9 <sup>3</sup> 4623 | .9 <sup>3</sup> 4810 | .9 <sup>3</sup> 4991 |
| 3.3 | .9 <sup>3</sup> 5166    | .9 <sup>3</sup> 5335 | .9 <sup>3</sup> 5499 | .9 <sup>3</sup> 5658 | .9 <sup>3</sup> 5811 | .9 <sup>3</sup> 5959 | .9 <sup>3</sup> 6103 | .9 <sup>3</sup> 6242 | .9 <sup>3</sup> 6376 | .9 <sup>3</sup> 6505 |
| 3.4 | .9 <sup>3</sup> 6631    | .9 <sup>3</sup> 6752 | .9 <sup>3</sup> 6869 | .9 <sup>3</sup> 6982 | .9 <sup>3</sup> 7091 | .9 <sup>3</sup> 7197 | .9 <sup>3</sup> 7299 | .9 <sup>3</sup> 7398 | .9 <sup>3</sup> 7493 | .9 <sup>3</sup> 7585 |
| 3.5 | .9 <sup>3</sup> 7674    | .9 <sup>3</sup> 7759 | .9 <sup>3</sup> 7842 | .9 <sup>3</sup> 7922 | .9 <sup>3</sup> 7999 | .9 <sup>3</sup> 8074 | .9 <sup>3</sup> 8146 | .9 <sup>3</sup> 8215 | .9 <sup>3</sup> 8282 | .9 <sup>3</sup> 8347 |
| 3.6 | .9 <sup>3</sup> 8409    | .9 <sup>3</sup> 8469 | .9 <sup>3</sup> 8527 | .9 <sup>3</sup> 8583 | .9 <sup>3</sup> 8637 | .9 <sup>3</sup> 8689 | .9 <sup>3</sup> 8739 | .9 <sup>3</sup> 8787 | .9 <sup>3</sup> 8834 | .9 <sup>3</sup> 8879 |
| 3.7 | .9 <sup>3</sup> 8922    | .9 <sup>3</sup> 8964 | .9 <sup>4</sup> 0039 | .9 <sup>4</sup> 0426 | .9 <sup>4</sup> 0799 | .9 <sup>4</sup> 1158 | .9 <sup>4</sup> 1504 | .9 <sup>4</sup> 1838 | .9 <sup>4</sup> 2159 | .9 <sup>4</sup> 2468 |
| 3.8 | .9 <sup>4</sup> 2765    | .9 <sup>4</sup> 3052 | .9 <sup>4</sup> 3327 | .9 <sup>4</sup> 3593 | .9 <sup>4</sup> 3848 | .9 <sup>4</sup> 4094 | .9 <sup>4</sup> 4331 | .9 <sup>4</sup> 4558 | .9 <sup>4</sup> 4777 | .9 <sup>4</sup> 4988 |
| 3.9 | .9 <sup>4</sup> 5190    | .9 <sup>4</sup> 5385 | .9 <sup>4</sup> 5573 | .9 <sup>4</sup> 5753 | .9 <sup>4</sup> 5926 | .9 <sup>4</sup> 6092 | .9 <sup>4</sup> 6253 | .9 <sup>4</sup> 6406 | .9 <sup>4</sup> 6554 | .9 <sup>4</sup> 6696 |
| 4.0 | .9 <sup>4</sup> 6833    | .9 <sup>4</sup> 6964 | .9 <sup>4</sup> 7090 | .9 <sup>4</sup> 7211 | .9 <sup>4</sup> 7327 | .9 <sup>4</sup> 7439 | .9 <sup>4</sup> 7546 | .9 <sup>4</sup> 7649 | .9 <sup>4</sup> 7748 | .9 <sup>4</sup> 7843 |
| 5   | .9 <sup>6</sup> 7134    |                      |                      |                      |                      |                      |                      |                      |                      |                      |
| 6   | .9 <sup>9</sup> 0134    |                      |                      |                      |                      |                      |                      |                      |                      |                      |
| 7   | .9 <sup>11</sup> 8720   |                      |                      |                      |                      |                      |                      |                      |                      |                      |
| 8   | .9 <sup>15</sup> 3779   |                      |                      |                      |                      |                      |                      |                      |                      |                      |
| 9   | .9 <sup>18</sup> 8872   |                      |                      |                      |                      |                      |                      |                      |                      |                      |
| 10  | .9 <sup>23</sup> 2380   |                      |                      |                      |                      |                      |                      |                      |                      |                      |
| 12  | .9 <sup>32</sup> 8224   |                      |                      |                      |                      |                      |                      |                      |                      |                      |
| 14  | .9 <sup>44</sup> 2207   |                      |                      |                      |                      |                      |                      |                      |                      |                      |
| 16  | .9 <sup>57</sup> 3611   |                      |                      |                      |                      |                      |                      |                      |                      |                      |
| 18  | .9 <sup>72</sup> 0259   |                      |                      |                      |                      |                      |                      |                      |                      |                      |
| 20  | .9 <sup>88</sup> 7246   |                      |                      |                      |                      |                      |                      |                      |                      |                      |
| 25  | .9 <sup>137</sup> 6943  |                      |                      |                      |                      |                      |                      |                      |                      |                      |
| 30  | .9 <sup>197</sup> 5093  |                      |                      |                      |                      |                      |                      |                      |                      |                      |
| 40  | .9 <sup>349</sup> 6344  |                      |                      |                      |                      |                      |                      |                      |                      |                      |
| 50  | .9 <sup>544</sup> 8919  |                      |                      |                      |                      |                      |                      |                      |                      |                      |
| 60  | .9 <sup>783</sup> 8762  |                      |                      |                      |                      |                      |                      |                      |                      |                      |
| 70  | .9 <sup>1066</sup> 4577 |                      |                      |                      |                      |                      |                      |                      |                      |                      |
| 80  | .9 <sup>1392</sup> 0976 |                      |                      |                      |                      |                      |                      |                      |                      |                      |
| 100 | .9 <sup>2173</sup> 8656 |                      |                      |                      |                      |                      |                      |                      |                      |                      |

INVERSE  $N(0, 1)$  C.d.f., giving z for a specified  $F(z) \geq 0.5$

|     |        |     |       |     |       |     |        |      |        |                 |        |
|-----|--------|-----|-------|-----|-------|-----|--------|------|--------|-----------------|--------|
| .50 | 0      | .60 | .2533 | .70 | .5244 | .80 | .8416  | .90  | 1.2816 | .990            | 2.3263 |
| .51 | .02507 | .61 | .2793 | .71 | .5534 | .81 | .8779  | .91  | 1.3408 | .991            | 2.3656 |
| .52 | .05015 | .62 | .3055 | .72 | .5828 | .82 | .9154  | .92  | 1.4051 | .992            | 2.4089 |
| .53 | .07527 | .63 | .3319 | .73 | .6128 | .83 | .9542  | .93  | 1.4758 | .993            | 2.4573 |
| .54 | .1004  | .64 | .3585 | .74 | .6433 | .84 | .9945  | .94  | 1.5548 | .994            | 2.5121 |
| .55 | .1257  | .65 | .3853 | .75 | .6745 | .85 | 1.0364 | .95  | 1.6449 | .995            | 2.5758 |
| .56 | .1510  | .66 | .4125 | .76 | .7063 | .86 | 1.0803 | .96  | 1.7507 | .996            | 2.6521 |
| .57 | .1764  | .67 | .4399 | .77 | .7388 | .87 | 1.1264 | .97  | 1.8808 | .997            | 2.7478 |
| .58 | .2019  | .68 | .4677 | .78 | .7722 | .88 | 1.1750 | .975 | 1.9600 | .998            | 2.8782 |
| .59 | .2275  | .69 | .4959 | .79 | .8064 | .89 | 1.2265 | .98  | 2.0537 | .999            | 3.0902 |
|     |        |     |       |     |       |     |        |      |        | .9 <sup>5</sup> | 3.2905 |
|     |        |     |       |     |       |     |        |      |        | .9 <sup>5</sup> | 3.8906 |
|     |        |     |       |     |       |     |        |      |        | .9 <sup>5</sup> | 4.4172 |
|     |        |     |       |     |       |     |        |      |        | .9 <sup>5</sup> | 4.8916 |

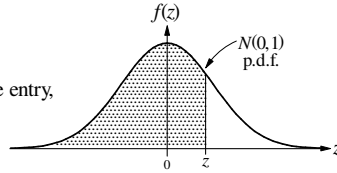
(continued overleaf)

2004-06-20

# PROBABILITIES FOR THE STANDARD NORMAL DISTRIBUTION $N(0,1)$ – 4,6 figure

## IN THE MAIN UPPER TABLE:

$\Pr[-\infty < N(0,1) \leq z\text{-value from table margins}] = \text{Table entry,}$   
 e.g.,  $\Pr[-\infty < N(0,1) \leq 0.00] = 0.5000^{00} = 0.5;$



## Notation:

$F(0.01) = .5040^{-11} = 0.503\ 989$   
 $F(0.05) = .5199^{39} = 0.519\ 939$   
 $F(2.33) = .920097 = 0.990\ 097,$  where  $F(z)$  is the  $N(0,1)$  c.d.f.  

$$F(z) = \int_{-\infty}^z f(t) dt = \int_{-\infty}^z \frac{1}{\sqrt{2\pi}} e^{-\frac{1}{2}t^2} dt.$$

THE SMALLER LOWER TABLE provides more accurate and convenient inverse lookup for selected probabilities in the interval 0.5 to 0.999 9995.

$N_{46}$   
right  
half

$N_{46}$   
right  
half

| z   | .00                  | .01                  | .02                  | .03                  | .04                  | .05                  | .06                  | .07                  | .08                  | .09                  |
|-----|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| 0.0 | .5000 <sup>00</sup>  | .5040 <sup>-11</sup> | .5080 <sup>-22</sup> | .5120 <sup>-34</sup> | .5160 <sup>-47</sup> | .5199 <sup>39</sup>  | .5239 <sup>22</sup>  | .5279 <sup>03</sup>  | .5319 <sup>-19</sup> | .5359 <sup>-44</sup> |
| 0.1 | .5398 <sup>28</sup>  | .5438 <sup>-05</sup> | .5478 <sup>-42</sup> | .5517 <sup>17</sup>  | .5557 <sup>-30</sup> | .5596 <sup>18</sup>  | .5636 <sup>-41</sup> | .5675 <sup>-05</sup> | .5714 <sup>24</sup>  | .5753 <sup>45</sup>  |
| 0.2 | .5793 <sup>-40</sup> | .5832 <sup>-34</sup> | .5871 <sup>-36</sup> | .5910 <sup>-46</sup> | .5948 <sup>35</sup>  | .5987 <sup>06</sup>  | .6026 <sup>-32</sup> | .6064 <sup>20</sup>  | .6103 <sup>-39</sup> | .6141 <sup>-08</sup> |
| 0.3 | .6179 <sup>11</sup>  | .6217 <sup>20</sup>  | .6255 <sup>16</sup>  | .6293 <sup>00</sup>  | .6331 <sup>-28</sup> | .6368 <sup>31</sup>  | .6406 <sup>-24</sup> | .6443 <sup>09</sup>  | .6480 <sup>27</sup>  | .6517 <sup>32</sup>  |
| 0.4 | .6554 <sup>22</sup>  | .6591 <sup>-03</sup> | .6628 <sup>-43</sup> | .6664 <sup>02</sup>  | .6700 <sup>31</sup>  | .6736 <sup>45</sup>  | .6772 <sup>12</sup>  | .6808 <sup>22</sup>  | .6844 <sup>-14</sup> | .6879 <sup>33</sup>  |
| 0.5 | .6915 <sup>-38</sup> | .6950 <sup>-26</sup> | .6985 <sup>-32</sup> | .7019 <sup>44</sup>  | .7054 <sup>01</sup>  | .7088 <sup>40</sup>  | .7123 <sup>-40</sup> | .7157 <sup>-39</sup> | .7190 <sup>43</sup>  | .7224 <sup>05</sup>  |
| 0.6 | .7257 <sup>47</sup>  | .7291 <sup>-31</sup> | .7324 <sup>-29</sup> | .7357 <sup>-47</sup> | .7389 <sup>14</sup>  | .7422 <sup>-46</sup> | .7454 <sup>-27</sup> | .7486 <sup>-29</sup> | .7517 <sup>48</sup>  | .7549 <sup>03</sup>  |
| 0.7 | .7580 <sup>36</sup>  | .7611 <sup>48</sup>  | .7642 <sup>38</sup>  | .7673 <sup>05</sup>  | .7704 <sup>-50</sup> | .7734 <sup>-27</sup> | .7764 <sup>-27</sup> | .7794 <sup>-50</sup> | .7823 <sup>05</sup>  | .7852 <sup>36</sup>  |
| 0.8 | .7881 <sup>45</sup>  | .7910 <sup>30</sup>  | .7939 <sup>-08</sup> | .7967 <sup>31</sup>  | .7995 <sup>46</sup>  | .8023 <sup>37</sup>  | .8051 <sup>05</sup>  | .8078 <sup>50</sup>  | .8106 <sup>-30</sup> | .8133 <sup>-33</sup> |
| 0.9 | .8159 <sup>40</sup>  | .8186 <sup>-11</sup> | .8212 <sup>14</sup>  | .8238 <sup>14</sup>  | .8264 <sup>-09</sup> | .8289 <sup>44</sup>  | .8315 <sup>-28</sup> | .8340 <sup>-23</sup> | .8365 <sup>-43</sup> | .8389 <sup>13</sup>  |
| 1.0 | .8413 <sup>45</sup>  | .8438 <sup>-48</sup> | .8461 <sup>36</sup>  | .8485 <sup>-05</sup> | .8508 <sup>30</sup>  | .8531 <sup>41</sup>  | .8554 <sup>28</sup>  | .8577 <sup>-10</sup> | .8599 <sup>29</sup>  | .8621 <sup>43</sup>  |
| 1.1 | .8643 <sup>34</sup>  | .8665 <sup>00</sup>  | .8686 <sup>43</sup>  | .8708 <sup>-38</sup> | .8729 <sup>-43</sup> | .8749 <sup>28</sup>  | .8770 <sup>-24</sup> | .8790 <sup>00</sup>  | .8810 <sup>00</sup>  | .8830 <sup>-23</sup> |
| 1.2 | .8849 <sup>30</sup>  | .8869 <sup>-39</sup> | .8888 <sup>-32</sup> | .8907 <sup>-49</sup> | .8925 <sup>12</sup>  | .8944 <sup>-50</sup> | .8962 <sup>-35</sup> | .8980 <sup>-42</sup> | .8997 <sup>27</sup>  | .9015 <sup>-25</sup> |
| 1.3 | .9032 <sup>00</sup>  | .9049 <sup>02</sup>  | .9066 <sup>-18</sup> | .9082 <sup>41</sup>  | .9099 <sup>23</sup>  | .9115 <sup>-08</sup> | .9131 <sup>-15</sup> | .9147 <sup>-43</sup> | .9162 <sup>07</sup>  | .9177 <sup>36</sup>  |
| 1.4 | .9192 <sup>43</sup>  | .9207 <sup>30</sup>  | .9222 <sup>-04</sup> | .9236 <sup>41</sup>  | .9251 <sup>-34</sup> | .9265 <sup>-29</sup> | .9279 <sup>-45</sup> | .9292 <sup>19</sup>  | .9306 <sup>-37</sup> | .9319 <sup>-12</sup> |
| 1.5 | .9332 <sup>-07</sup> | .9345 <sup>-22</sup> | .9357 <sup>45</sup>  | .9370 <sup>-08</sup> | .9382 <sup>20</sup>  | .9394 <sup>29</sup>  | .9406 <sup>20</sup>  | .9418 <sup>-08</sup> | .9429 <sup>47</sup>  | .9441 <sup>-17</sup> |
| 1.6 | .9452 <sup>01</sup>  | .9463 <sup>01</sup>  | .9474 <sup>-16</sup> | .9484 <sup>49</sup>  | .9495 <sup>-03</sup> | .9505 <sup>29</sup>  | .9515 <sup>43</sup>  | .9525 <sup>40</sup>  | .9535 <sup>21</sup>  | .9545 <sup>-14</sup> |
| 1.7 | .9554 <sup>35</sup>  | .9564 <sup>-33</sup> | .9573 <sup>-16</sup> | .9582 <sup>-15</sup> | .9591 <sup>-30</sup> | .9599 <sup>41</sup>  | .9608 <sup>-04</sup> | .9616 <sup>36</sup>  | .9625 <sup>-38</sup> | .9633 <sup>-27</sup> |
| 1.8 | .9641 <sup>-30</sup> | .9649 <sup>-48</sup> | .9656 <sup>20</sup>  | .9664 <sup>-25</sup> | .9671 <sup>16</sup>  | .9678 <sup>43</sup>  | .9686 <sup>-43</sup> | .9693 <sup>-42</sup> | .9699 <sup>46</sup>  | .9706 <sup>21</sup>  |
| 1.9 | .9713 <sup>-17</sup> | .9719 <sup>33</sup>  | .9726 <sup>-29</sup> | .9732 <sup>-03</sup> | .9738 <sup>10</sup>  | .9744 <sup>12</sup>  | .9750 <sup>02</sup>  | .9756 <sup>-19</sup> | .9761 <sup>48</sup>  | .9767 <sup>05</sup>  |
| 2.0 | .9772 <sup>50</sup>  | .9778 <sup>-16</sup> | .9783 <sup>08</sup>  | .9788 <sup>22</sup>  | .9793 <sup>25</sup>  | .9798 <sup>18</sup>  | .9803 <sup>01</sup>  | .9808 <sup>-26</sup> | .9812 <sup>37</sup>  | .9817 <sup>-09</sup> |
| 2.1 | .9821 <sup>36</sup>  | .9826 <sup>-29</sup> | .9830 <sup>-03</sup> | .9834 <sup>14</sup>  | .9838 <sup>23</sup>  | .9842 <sup>22</sup>  | .9846 <sup>14</sup>  | .9850 <sup>-03</sup> | .9854 <sup>-29</sup> | .9857 <sup>38</sup>  |
| 2.2 | .9861 <sup>-03</sup> | .9864 <sup>47</sup>  | .9868 <sup>-09</sup> | .9871 <sup>26</sup>  | .9875 <sup>-45</sup> | .9878 <sup>-24</sup> | .9881 <sup>-11</sup> | .9884 <sup>-04</sup> | .9887 <sup>-04</sup> | .9890 <sup>-11</sup> |
| 2.3 | .9893 <sup>-24</sup> | .9896 <sup>-44</sup> | .9898 <sup>30</sup>  | .920097              | .920358              | .920613              | .920863              | .921106              | .921344              | .921576              |
| 2.4 | .921802              | .922024              | .922240              | .922451              | .922656              | .922857              | .923053              | .923244              | .923431              | .923613              |
| 2.5 | .923790              | .923963              | .924132              | .924297              | .924457              | .924614              | .924766              | .924915              | .925060              | .925201              |
| 2.6 | .925339              | .925473              | .925604              | .925731              | .925855              | .925975              | .926093              | .926207              | .926319              | .926427              |
| 2.7 | .926533              | .926636              | .926736              | .926833              | .926928              | .927020              | .927110              | .927197              | .927282              | .927365              |
| 2.8 | .927445              | .927523              | .927599              | .927673              | .927744              | .927814              | .927882              | .927948              | .928012              | .928074              |
| 2.9 | .928134              | .928193              | .928250              | .928305              | .928359              | .928411              | .928462              | .928511              | .928559              | .928605              |
| 3.0 | .928650              | .928694              | .928736              | .928777              | .928817              | .928856              | .928893              | .928930              | .928965              | .928999              |
| 3.1 | .9290324             | .9290646             | .9290957             | .9291260             | .9291553             | .9291836             | .9292112             | .9292378             | .9292636             | .9292886             |
| 3.2 | .9293129             | .9293363             | .9293590             | .9293810             | .9294024             | .9294230             | .9294429             | .9294623             | .9294810             | .9294991             |
| 3.3 | .9295166             | .9295335             | .9295499             | .9295658             | .9295811             | .9295959             | .9296103             | .9296242             | .9296376             | .9296505             |
| 3.4 | .9296631             | .9296752             | .9296869             | .9296982             | .9297091             | .9297197             | .9297299             | .9297398             | .9297493             | .9297585             |
| 3.5 | .9297674             | .9297759             | .9297842             | .9297922             | .9297999             | .9298074             | .9298146             | .9298215             | .9298282             | .9298347             |
| 3.6 | .9298409             | .9298469             | .9298527             | .9298583             | .9298637             | .9298689             | .9298739             | .9298787             | .9298834             | .9298879             |
| 3.7 | .9298922             | .9298964             | .92990039            | .92990426            | .92990799            | .92991158            | .92991504            | .92991838            | .92992159            | .92992468            |
| 3.8 | .92992765            | .92993052            | .92993327            | .92993593            | .92993848            | .92994094            | .92994331            | .92994558            | .92994777            | .92994988            |
| 3.9 | .92995190            | .92995385            | .92995573            | .92995753            | .92995926            | .92996092            | .92996253            | .92996406            | .92996554            | .92996696            |
| 4.0 | .92996833            | .92996964            | .92997090            | .92997211            | .92997327            | .92997439            | .92997546            | .92997649            | .92997748            | .92997843            |
| 5   | .92997134            |                      |                      |                      |                      |                      |                      |                      |                      |                      |
| 6   | .929970134           |                      |                      |                      |                      |                      |                      |                      |                      |                      |
| 7   | .929968720           |                      |                      |                      |                      |                      |                      |                      |                      |                      |
| 8   | .929967379           |                      |                      |                      |                      |                      |                      |                      |                      |                      |
| 9   | .9299660872          |                      |                      |                      |                      |                      |                      |                      |                      |                      |
| 10  | .929964802380        |                      |                      |                      |                      |                      |                      |                      |                      |                      |
| 12  | .929963528224        |                      |                      |                      |                      |                      |                      |                      |                      |                      |
| 14  | .92996224207         |                      |                      |                      |                      |                      |                      |                      |                      |                      |
| 16  | .9299609573611       |                      |                      |                      |                      |                      |                      |                      |                      |                      |
| 18  | .9299596720259       |                      |                      |                      |                      |                      |                      |                      |                      |                      |
| 20  | .9299583887246       |                      |                      |                      |                      |                      |                      |                      |                      |                      |
| 25  | .929956991376943     |                      |                      |                      |                      |                      |                      |                      |                      |                      |
| 30  | .9299555975093       |                      |                      |                      |                      |                      |                      |                      |                      |                      |
| 40  | .929954196344        |                      |                      |                      |                      |                      |                      |                      |                      |                      |
| 50  | .9299527848919       |                      |                      |                      |                      |                      |                      |                      |                      |                      |
| 60  | .9299513783862       |                      |                      |                      |                      |                      |                      |                      |                      |                      |
| 70  | .929949970664577     |                      |                      |                      |                      |                      |                      |                      |                      |                      |
| 80  | .9299485613920976    |                      |                      |                      |                      |                      |                      |                      |                      |                      |
| 100 | .929947151738656     |                      |                      |                      |                      |                      |                      |                      |                      |                      |

INVERSE  $N(0,1)$  C.d.f., giving  $z$  for a specified  $F(z) \geq 0.5$

|     |           |     |          |     |          |     |           |      |           |      |           |
|-----|-----------|-----|----------|-----|----------|-----|-----------|------|-----------|------|-----------|
| .50 | 0         | .60 | .253 347 | .70 | .524 401 | .80 | .841 621  | .90  | 1.281 552 | .990 | 2.326 348 |
| .51 | .0250 689 | .61 | .279 319 | .71 | .553 385 | .81 | .877 896  | .91  | 1.340 755 | .991 | 2.365 618 |
| .52 | .0501 536 | .62 | .305 481 | .72 | .582 842 | .82 | .915 365  | .92  | 1.405 072 | .992 | 2.408 916 |
| .53 | .0752 699 | .63 | .331 853 | .73 | .612 813 | .83 | .954 165  | .93  | 1.475 791 | .993 | 2.457 263 |
| .54 | .100 434  | .64 | .358 459 | .74 | .643 345 | .84 | .994 458  | .94  | 1.554 774 | .994 | 2.512 144 |
| .55 | .125 661  | .65 | .385 320 | .75 | .674 490 | .85 | 1.036 433 | .95  | 1.644 854 | .995 | 2.575 829 |
| .56 | .150 969  | .66 | .412 463 | .76 | .706 303 | .86 | 1.080 319 | .96  | 1.750 686 | .996 | 2.652 070 |
| .57 | .176 374  | .67 | .439 913 | .77 | .738 847 | .87 | 1.126 391 | .97  | 1.880 794 | .997 | 2.747 781 |
| .58 | .201 893  | .68 | .467 699 | .78 | .772 193 | .88 | 1.174 987 | .975 | 1.959 964 | .998 | 2.878 162 |
| .59 | .227 545  | .69 | .495 850 | .79 | .806 421 | .89 | 1.226 528 | .98  | 2.053 749 | .999 | 3.090 232 |
|     |           |     |          |     |          |     |           |      |           | .995 | 3.290 527 |
|     |           |     |          |     |          |     |           |      |           | .995 | 3.890 592 |
|     |           |     |          |     |          |     |           |      |           | .995 | 4.417 173 |
|     |           |     |          |     |          |     |           |      |           | .995 | 4.891 638 |

Most table entries were obtained from `pnorm` or `qnorm` in R version 2.14.0

2012-01-20