

## Normal Probability

This active table allows you to type in any of the  $z$  or  $x$  value, the standard deviation (sd) or variance (var), or the probability you want. The other parameters will adjust accordingly. The inverse normal relationship is therefore provided by typing in the desired probability value. Remember that the normal distribution is a continuous distribution, meaning that the values on the  $x$  axis are real. Thus the probability for any given  $x$  axis point is a cumulative probability derived from the area under the curve ie the integral of the normal curve. This area is also termed the cumulative probability since the actual probability for any real number is infinitely small and individually meaningless.

The parameters can be typed into their respective boxes, using the **Tab** key to move from one to the next (**Shift-Tab** moves you back again, and **Enter** or **Return** keys will indicate that you have finished typing in that number). The relationship between the parameters is given by the equation:  $z = (x - \mu) / sd$ , where  $\mu$  is the sample mean, and  $sd$  the sample standard deviation. The popup button at the bottom left of the dialog box allows you to specify which part of the area under the curve you wish to view. You may select the following probabilities:  $N < z$ ,  $N > z$ ,  $N < -z + N > z$ , and  $-z < N < z$ , where  $N$  represents the Normal probability distribution.

By dragging to left or right on the sliding control you can alter the  $z$  value, within the limits  $\pm 3.5$ , and the probability value will also alter accordingly. To show a plot of the current settings, click the **Show Graph** check box (shortcut Command-S).