z score. After entering a value, click on the **Evaluate** button. (See the STATDISK display in Example 1.)

MINITAB

- *Finding Area:* To find the cumulative area to the left of a z score (as in Table A-2), select **Calc, Probability Distributions, Normal, Cumulative probabilities.** Enter the mean and standard deviation, then click on the **Input Constant** button and enter the value.
- *Finding x Value:* To find a value corresponding to a known area, select **Calc, Probability Distributions, Normal,** then select **Inverse cumulative probabilities.** Enter the mean and standard deviation. Select the option **Input constant,** and enter the total area to the left of the given value.

EXCEL

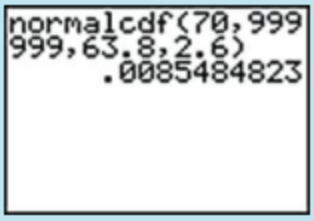
- *Finding Area:* To find the cumulative area to the left of a value (as in Table A-2), click on ***fx*,** then select **Statistical, NORMDIST** (or **NORM.DIST**). In the dialog box, enter the value for x, enter the mean and standard deviation, and enter 1 in the "cumulative" space.
- *Finding x Value:* To find a value corresponding to a known area, select ***fx*, Statistical, NORMINV** (or **NORM.INV**) and proceed to make the entries in the dialog box. When entering the probability value, enter the total area to the left of the given value. (See the Excel display in Example 3.)

TI-83/84 PLUS

- *Finding Area:* To find the area between two values, press 2ND, then press VARS to get to the **DISTR** (distribution) menu. Select **normalcdf.** Enter the two values, the mean, and the standard deviation, all separated by commas, as in this format: (left value, right value, mean, standard deviation).

  Hint: If there is no left value, enter the left value as −999999, and if there is no right value, enter the right value as 999999. In Example 1 we want the area to the right of $x = 70$ in. and we have a normal distribution with mean 63.8 in. and standard deviation 2.6 in., so use the command **normalcdf (70, 999999, 63.8, 2.6)** as shown in the accompanying screen display. Because Example 1 uses a rounded z score, the result of 0.0085 (rounded) shown here is more accurate than the result of 0.0087 found in Example 1.

TI-83/83 PLUS



- *Finding x Value:* To find a value corresponding to a known area, press 2ND, then press VARS to get to the **DISTR** (distribution) menu. Select **invNorm,** and proceed to enter the total area to the left of the value, the mean, and the standard deviation in the format of (total area to the left, mean, standard deviation) with the commas included. For Example 3, the command of **invNorm(0.95, 69.5, 2.4)** will yield the result of 73.4476487, which is 73.4 when rounded.

STATCRUNCH Click on **Open StatCrunch,** then click on **Stat.** Select **Calculators,** then select **Normal.** You can either enter a probability or a value of x. Click on **Compute.**

6-3 Basic Skills and Concepts

Statistical Literacy and Critical Thinking

1. Pulse Rates Pulse rates of women are normally distributed with a mean of 77.5 beats per minute and a standard deviation of 11.6 beats per minute (based on Data Set 1 in Appendix B).

a. What are the values of the mean and standard deviation after converting all pulse rates of women to z scores using $z = (x - \mu)/\sigma$?

b. The original pulse rates are measured with units of "beats per minute." What are the units of the corresponding z scores?

2. IQ Scores The Wechsler Adult Intelligence Scale is an IQ score obtained through a test, and the scores are normally distributed with a mean of 100 and a standard deviation of 15. A bell-shaped graph is drawn to represent this distribution.

a. For the bell-shaped graph, what is the area under the curve?

b. What is the value of the median?

c. What is the value of the mode?

d. What is the value of the variance?