Step 3: If using Table A-2, refer to that table with $z = 1.46$ and find that the cumulative area to the *left* of $z = 1.46$ is 0.9279. (Remember, Table A-2 is designed so that all areas are cumulative areas from the *left*.) Table A-2 also shows that $z = -3.13$ corresponds to an area of 0.0009.

Because the areas of 0.9279 and 0.0009 are *cumulative areas from the left,* we find the shaded area in Figure 6-13 as follows:

$$\text{Shaded area in Figure 6-13} = 0.9279 - 0.0009 = 0.9270$$

There is a small discrepancy between the area of 0.9267 obtained using technology and the area of 0.9270 obtained using Table A-2. The area obtained from technology is more accurate because it is based on unrounded z scores of 1.4583333 and -3.125, whereas Table A-2 requires z scores rounded to two decimal places.

Interpretation

Expressing the result as a percentage, we conclude that about 93% of men satisfy the height requirement between 62 in. and 73 in. About 7% of men do not meet that requirement and they are not eligible to work as cabin crew members. Figure 6-13 shows that most of the ineligible men are those who are very tall, and this makes sense when we consider that some jets have low cabin heights that would cause problems for the tallest men. For example, the Embraer 145 jet has a cabin ceiling height of 71.7 in., so men taller than 71.7 in. would need to bend the entire time that they are standing.

Finding Values from Known Areas

Here are helpful hints for those cases in which the area (or probability or percentage) is known and we must find the relevant value(s):

1. *Don't confuse z scores and areas.* Remember, z scores are *distances* along the horizontal scale, but areas are *regions* under the normal curve. Table A-2 lists z scores in the left columns and across the top row, but areas are found in the body of the table.
2. *Choose the correct* (*right* / *left*) *side of the graph.* A value separating the *top* 10% from the others will be located on the right side of the graph, but a value separating the *bottom* 10% will be located on the left side of the graph.
3. A z score must be *negative* whenever it is located in the *left* half of the normal distribution.
4. Areas (or probabilities) are positive or zero values, but they are never negative.

Graphs are extremely helpful in visualizing, understanding, and successfully working with normal probability distributions, so they should be used whenever possible.

Procedure for Finding Values from Known Areas or Probabilities

1. Sketch a normal distribution curve, enter the given probability or percentage in the appropriate region of the graph, and identify the x value(s) being sought.
2. If using technology, refer to the instructions at the end of this section. If using Table A-2, refer to the *body* of Table A-2 to find the area to the left of x, then identify the z score corresponding to that area.