6. a. If 1 adult female is randomly selected, find the probability that her overhead reach is less than 196.9 cm.

b. If 36 adult females are randomly selected, find the probability that they have a mean overhead reach less than 205.0 cm.

7. a. If 1 adult female is randomly selected, find the probability that her overhead reach is greater than 218.4 cm.

b. If 9 adult females are randomly selected, find the probability that they have a mean overhead reach greater than 204.0 cm.

c. Why can the normal distribution be used in part (b), even though the sample size does not exceed 30?

8. a. If 1 adult female is randomly selected, find the probability that her overhead reach is greater than 195.0 cm.

b. If 25 adult females are randomly selected, find the probability that they have a mean overhead reach greater than 203.0 cm.

c. Why can the normal distribution be used in part (b), even though the sample size does not exceed 30?

9. a. If 1 adult female is randomly selected, find the probability that her overhead reach is between 179.7 cm and 231.3 cm.

b. If 40 adult females are randomly selected, find the probability that they have a mean overhead reach between 204.0 cm and 206.0 cm.

10. a. If 1 adult female is randomly selected, find the probability that her overhead reach is between 180.0 cm and 200.0 cm.

b. If 50 adult females are randomly selected, find the probability that they have a mean overhead reach between 198.0 cm and 206.0 cm.

11. Elevator Safety Example 2 referred to an Ohio elevator with a maximum capacity of 2500 lb. When rating elevators, it is common to use a 25% safety factor, so the elevator should actually be able to carry a load that is 25% greater than the stated limit. The maximum capacity of 2500 lb becomes 3125 lb after it is increased by 25%, so 16 male passengers can have a mean weight of up to 195.3 lb. If the elevator is loaded with 16 male passengers, find the probability that it is overloaded because they have a mean weight greater than 195.3 lb. (As in Example 2, assume that weights of males are normally distributed with a mean of 182.9 lb and a standard deviation of 40.8 lb.) Does this elevator appear to be safe?

12. Elevator Safety Exercise 11 uses μ182.9 lb, which is based on Data Set 1 in Appendix B. Repeat Exercise 11 using μ174 lb (instead of 182.9 lb), which is the assumed mean weight that was commonly used just a few years ago. Assuming that the mean weight of males is now 182.9 lb, not the value of 174 lb that was used just a few years ago, what do you conclude about the effect of using an outdated mean that is substantially lower than it should be?

13. Designing Hats Women have head circumferences that are normally distributed with a mean of 22.65 in. and a standard deviation of 0.80 in. (based on data from the National Health and Nutrition Examination Survey).

a. If the Hats by Leko company produces women's hats so that they fit head circumferences between 21.00 in. and 25.00 in., what percentage of women can fit into these hats?

b. If the company wants to produce hats to fit all women except for those with the smallest 2.5% and the largest 2.5% head circumferences, what head circumferences should be accommodated?

continued