6. Calculate *SS*, variance, and standard deviation for the following sample: 0, 3, 0, 3. (*Note:* The computational formula for *SS* works best with these scores.)

10. For the following sample of $n = 5$ scores:

10, 0, 6, 2, 2

a. Sketch a histogram showing the sample distribution.
b. Locate the value of the sample mean in your sketch, and make an estimate of the sample standard deviation (as done in Example 4.6).
c. Compute *SS*, variance, and standard deviation for the sample. (How well does your estimate compare with the actual value of *s*?)

13. For the following population of $N = 6$ scores:

8, 10, 4, 8, 5, 13

a. Sketch a histogram showing the population distribution.
b. Locate the value of the population mean in your sketch, and make an estimate of the standard deviation (as done in Example 4.5).
c. Compute *SS*, variance, and standard deviation for the population. (How well does your estimate compare with the actual value of σ?)

18. For the following population of scores:

1, 6, 9, 0, 4

a. Find the mean for the population, and compute the deviation score for each individual.
b. Show that the deviation scores sum to zero.
c. Square each deviation, and find the sum of squared deviations (*SS*).
d. Now assume that the set of scores is a sample instead of a population, and repeat parts a, b, and c. How does the distinction between a sample and a population affect the calculation of *SS*?

20. Sketch a normal distribution with $\mu = 50$ and $\sigma = 20$.
a. Locate each of the following scores in your sketch, and indicate whether you consider each score to be an extreme value (high or low) or a central value:

65, 55, 40, 47

b. Make another sketch showing a distribution with $\mu = 50$, but this time with $\sigma = 2$. Now locate each of the four scores in the new distribution, and indicate whether they are extreme or central.
(*Note:* The value of the standard deviation can have a dramatic effect on the location of a score within a distribution.

21. For the following population of scores:

3, 4, 4, 1, 7, 3, 2, 6, 4, 2

1, 6, 3, 4, 5, 2, 5, 4, 3, 4

a. Sketch a frequency distribution histogram.
b. Find the range for the population. (*Hint:* You can use the formula for the range, or you can simply count the boxes or categories across the base of the histogram.)
c. Find the interquartile range and the semi-interquartile range for the population.

22. For the following population of $N = 4$ scores:

2, 0, 8, 2

a. Use the definitional formula to compute *SS*; then find the population variance and the standard deviation.
b. Add 3 points to each score; then compute *SS*, variance, and standard deviation for the new population.
c. Multiple each of the original scores by 2; then compute *SS*, variance, and standard deviation for the new population.
d. When a constant is added to each score, what happens to the deviation scores? What happens to the standard deviation?
e. When each score is multiplied by a constant, what happens to the deviation scores? What happens to the standard deviation?