23. **TAKS REASONING** Create a data set with a mean of 10, a median of 11, and a mode of 8.

24. **TAKS REASONING** An outlier can be defined as a value in a data set that lies more than three standard deviations from the mean. So, x is an outlier if $\frac{|x - \overline{x}|}{\sigma} > 3$. In parts (a)–(c), use this definition to identify the outlier(s) in the data set. *Justify* your answers mathematically.

a. 70, 55, 54, 75, 60, 58, 55, 56, 6, 62, 68, 94, 55, 82, 69, 74

b. 18, 20, 22, 25, 16, 40, 24, 19, 38, 3, 21, 27, 88, 24, 23, 26

c. 50, 93, 81, 84, 88, 85, 90, 99, 92, 199, 96, 89, 87, 94, 37

25. **CHALLENGE** The formula for standard deviation can also be written as:

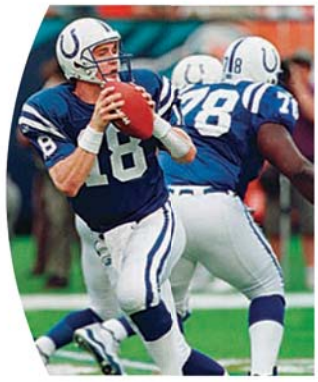
$$\sigma = \sqrt{\frac{x_1^{\,2} + x_2^{\,2} + \cdots + x_n^{\,2}}{n} - \overline{x}^2}$$

For $n = 3$, show that this formula is equivalent to the formula given on page 745. (*Hint:* You will need to show that $x_1 + x_2 + x_3 = 3\overline{x}$.)

PROBLEM SOLVING

EXAMPLES 1, 2, and 3 on pp. 744–745 for Exs. 26–28

26. **FOOTBALL** The data set below gives the numbers of passing touchdowns for the 12 quarterbacks who threw the most touchdowns during the 2004 NFL regular season. Find the mean, median, mode, range, and standard deviation.



49, 39, 31, 30, 29, 28, 27, 27, 27, 22, 21, 21

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27. **OLYMPIC SOFTBALL** The data set below gives the total number of at-bats for each player on the 2004 U.S. women's Olympic softball team. Find the mean, median, and mode of the data set.

2, 6, 6, 16, 19, 20, 20, 21, 22, 25, 26, 30

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28. **ARCHERY** The data set below gives the scores of the contestants in the first round of a junior archery competition. Find the mean, median, mode, range, and standard deviation.

111, 114, 97, 102, 120, 113, 116, 114, 106, 110

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EXAMPLE 4 on p. 746 for Ex. 29

29. **MULTI-STEP PROBLEM** The data set below gives the numbers of trials required by 10 puppies to learn a trick.

20, 23, 19, 25, 21, 23, 5, 24, 19, 23

a. **Analyze** Identify the outlier of the data set.

b. **Calculate** Find the mean, median, mode, range, and standard deviation of the data set when the outlier is included and when it is not.

c. **Reasoning** *Describe* the outlier's effect on the measures of central tendency and dispersion.

= WORKED-OUT SOLUTIONS on p. WS1

= TAKS PRACTICE AND REASONING