

**GUIDED PRACTICE** for Example 1

1. **TRANSPORTATION** The data set below gives the waiting times (in minutes) of 10 students waiting for a bus. Find the mean, median, and mode of the data set.

4, 8, 12, 15, 3, 2, 6, 9, 8, 7

MEASURES OF DISPERSION A **measure of dispersion** is a statistic that tells you how *dispersed*, or spread out, data values are. One simple measure of dispersion is the **range**, which is the difference between the greatest and least data values.

EXAMPLE 2 Find ranges of data sets

Find the range of the waiting times in each data set in Example 1.

Solution

Office A: Range = $32 - 14 = 18$ **Office B:** Range = $23 - 8 = 15$

Because the range for office A is greater, its waiting times are more spread out.

STANDARD DEVIATION Another measure of dispersion is *standard deviation*, which describes the typical difference (or *deviation*) between a data value and the mean.

KEY CONCEPT*For Your Notebook***Standard Deviation of a Data Set**

The **standard deviation** σ (read as “sigma”) of x_1, x_2, \dots, x_n is:

$$\sigma = \sqrt{\frac{(x_1 - \bar{x})^2 + (x_2 - \bar{x})^2 + \dots + (x_n - \bar{x})^2}{n}}$$

**EXAMPLE 3** TAKS PRACTICE: Multiple Choice

What is the standard deviation of the waiting times in each data set from Example 1?

- (A) 4.7 and 5.2 (B) 5.7 and 5.2 (C) 4.7 and 4.5 (D) 5.7 and 4.5

Solution

$$\text{Office A: } \sigma = \sqrt{\frac{(14 - 22)^2 + (17 - 22)^2 + \dots + (32 - 22)^2}{9}} = \sqrt{\frac{290}{9}} \approx 5.7$$

$$\text{Office B: } \sigma = \sqrt{\frac{(8 - 16)^2 + (11 - 16)^2 + \dots + (23 - 16)^2}{9}} = \sqrt{\frac{182}{9}} \approx 4.5$$

► The correct answer is D. (A) (B) (C) (D)