

# Assignment

## Write

Match each definition to its corresponding term.

- |                                |   |
|--------------------------------|---|
| 1. interquartile range (IQR)   | a. a value calculated using the formula $Q1 - (IQR \cdot 1.5)$            |
| 2. standard deviation          | b. numeric characteristics of a data set                                  |
| 3. lower fence                 | c. a value that is much greater or lesser than other values in a data set |
| 4. upper fence                 | d. a value calculated using the formula $Q3 + (IQR \cdot 1.5)$            |
| 5. statistic                   | e. a measure of spread from the mean                                      |
| 6. measure of central tendency | f. a value used to describe the overall clustering of data in a set       |
| 7. outlier                     | g. a measure of spread from the median                                    |

## Remember

The median is the better measure of central tendency and the IQR is the better measure of spread to use to describe a data set that is skewed. The mean is the better measure of central tendency and the standard deviation is the better measure of spread to use to describe a data set that is symmetric.

Outliers in a data set are calculated using the formula  $Q1 - (IQR \cdot 1.5)$  to determine a lower fence and  $Q3 + (IQR \cdot 1.5)$  to determine an upper fence. Any value outside these limits is an outlier.

## Practice

- Consider each data set. Calculate the median, mean, IQR, and standard deviation of each set. Then, determine which measure of central tendency and which measure of spread is the most appropriate to use to describe the data set. Explain your reasoning.
  - 1, 2, 2, 4, 8, 8, 8, 9, 9, 9, 10, 10, 10
  - 5, 5, 6, 6, 6, 7, 7, 7, 8, 8, 8, 9, 9
  - 0, 1, 2, 10, 12, 12, 16, 16, 16, 16, 18, 18, 20
  - 2, 2, 2, 3, 3, 4, 4, 8, 9, 9, 10, 10, 10
- The five number summaries for the average monthly precipitation in millimeters during the summer for the Western and Midwestern states are provided.
  - Construct box-and-whisker plots of each area's monthly precipitation using the same number line for each.

West	Midwest
Min = 7	Min = 68
Q1 = 22	Q1 = 81.5
Med = 33	Med = 99.5
Q3 = 49	Q3 = 102.5
Max = 107	Max = 111
  - Describe the distribution of both box-and-whisker plots and explain what they mean in terms of the problem situation.
  - Determine if there are outliers in either data set. Show your work and explain how you determined your answer.
  - Chen is considering a long camping trip this summer and hopes to avoid the rain. Would you recommend that he camp in the West or the Midwest? Explain your reasoning.

## Stretch

Create a data set of 15 numbers where the mean and median are both 59 and the standard deviation is between 10 and 11. Then, add an outlier to your data set. How are the mean and standard deviation affected?

## Review

- Alejandra has \$900 to open a bank account. She wants to put her money in the bank where she will earn the most money over time. Alejandra has a choice between the Platinum Bank that offers an account with 3% compound interest and the Diamond Bank that offers an account with 4% simple interest.
  - What is the function used to calculate the balance in each account based on the year,  $t$ ? Describe each function.
  - In which bank should Alejandra deposit her money? Explain your reasoning.
- The following is a list of seconds it takes swimmers to swim 50 yards freestyle.  
29, 27, 28, 24, 32, 30, 28, 29, 32, 26, 34, 30, 25, 27, 30, 29, 25, 28, 29, 32
  - Construct a box-and-whisker plot based on the list of swimmers' times.
  - What does the distribution of the box-and-whisker plot mean in terms of the swimmers' times?
- Solve for  $x$  in each equation.
  - $6^{5x-4} = 6^{4x}$
  - $9^x = 3^{3x+2}$