

**LESSON
10.5****Challenge Practice***For use with the lesson "Interpret Box-and-Whisker Plots"***In Exercises 1 and 2, use the following information to find the mild and extreme outliers of the data set.**

Some statisticians further classify outliers as either mild outliers or extreme outliers. *Mild outliers* are data values which lie between 1.5 and 3 times the interquartile range either above the upper quartile or below the lower quartile. *Extreme outliers* are data values that lie more than three times the interquartile range either above the upper quartile or below the lower quartile.

- 0, 5, 25, 29, 32, 32, 33, 34, 35, 38, 43, 62, 86
- 1, 12, 34, 80, 81, 82, 84, 84, 84, 88, 92, 100, 135, 146, 169
- Construct two different data sets, each of which has the same range, the same interquartile range, and the same mean.
- Construct two different data sets, each of which has the same mean and the same range, but different interquartile ranges.

In Exercises 5 and 6, use the following information.

For any box-and-whisker plot, there are five numbers plotted. The five numbers are called the five-number summary and consist of the minimum of the data set, the lower quartile Q_1 , the median, the upper quartile Q_3 , and the maximum of the data set. Suppose three data sets have the following five-number summaries.

Data set 1: 2, 4, 7, 13, 20

Data set 2: 3, 5, 10, 13, 15

Data set 3: 312, 313, 318, 323, 331

You can compute the four *successive differences* to measure the four components of the box-and-whisker plot: $Q_1 - \text{minimum} =$ the length of the left whisker, $\text{median} - Q_1 =$ the length of the left part of the box, $Q_3 - \text{median} =$ the length of the right part of the box, and $\text{maximum} - Q_3 =$ the length of the right whisker.

- Calculate the successive differences of the three data sets.
- Based on the successive differences calculated in Exercise 5, which two data sets have the most similar distributions? *Explain* your reasoning.