13-4 Measures of Variation (Pages 731–736)

Finding Measures of Variation	• The **range** of a set of data is the difference between the greatest and the least values of the set. • The **quartiles** in a set of data are the values that divide the data into four equal parts. • The *median* (Q2) separates the data into two equal parts. • The **lower quartile** (Q1) is the median of the lower half of the data. • The **upper quartile** (Q3) is the median of the upper half of the data. • Q3 − Q1 is the **interquartile range**.

Example

Find the range, median, upper quartile, lower quartile, and interquartile range for 10, 14, 17, 18, 21, 25, 27, 28.

Notice that the data is already arranged in order from least to greatest.
range: *28 − 10 or 18*   **lower quartile (Q1):** *(14 +17) ÷ 2 or 15.5*
median (Q2): *(18 + 21) ÷ 2 or 19.5*   **upper quartile (Q3):** *(25 + 27) ÷ 2 or 26.*
interquartile range: *Q3 − Q1, or 26 − 15.5 or 10.5.*

Try These Together

Find the range, median, upper quartile, lower quartile, and interquartile range for each set of data.

1. 2, 5, 8, 7, 2, 1   **2.** 40°, 44°, 52°, 48°, 47°, 51°, 40°

HINT: First arrange the data in order. Then find the median. If the median is an item in the set of data, it is not included in either the upper or lower half of the data.

Practice

Find the range, median, upper quartile, lower quartile, and interquartile range for each set of data.

3.

Stem	Leaf
9	1
8	5 8 9
7	0 2 5 9
6	3

9|1 = 91 km

4.

Stem	Leaf
10	5
11	6 8 9
12	0 0 1 1 5 7

10|5 = 105 yd

5.

Stem	Leaf
2	0 0 5
3	0 5 5 5
4	0 5
5	5
6	0

2|0 = $20

6. School The following is a list of grades on an algebra test.
80, 92, 95, 70, 88, 60, 76, 90, 84, 74, 64, 98
  a. Find the median and upper quartile.
  b. What is the lowest grade in the top 25% of the data?
  c. What is the lowest grade in the top 50% of the data?

7. Standardized Test Practice Which of the following does *not* represent approximately 25% of a data set?
  A data below lower quartile   **B** data between lower quartile and median
  C data above upper quartile   **D** data between upper and lower quartiles

Answers: 1. 7; 3.5; 7; 2; 5 **2.** 12; 47; 51; 40; 11 **3.** 28; 79; 88.5; 71; 17.5 **4.** 22; 120; 121; 118; 3 **5.** 40; 35; 45; 25; 20 **6a.** 82; 91 **6b.** 92 **6c.** 84 **7.** D