

Lesson 3 Reteach

Measures of Variation

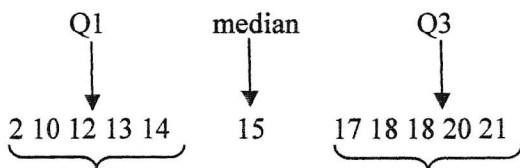
Measures of variation are used to describe the distribution, or spread, of the data. The **range** is the difference between the greatest and least data values. **Quartiles** are values that divide the data set into four equal parts. The median of the lower half of a set of data is the **first quartile** and the median of the upper half of a set of data is the **third quartile**. The difference between the third quartile and the first quartile is called the **interquartile range**.

Example 1

Find the measures of variation for the number of votes received for student government president:
13, 20, 18, 12, 21, 2, 18, 17, 15, 10, and 14.

The greatest number in the data set is 21. The least number is 2.
The range is $21 - 2$ or 19 votes.

To find the quartiles, arrange the numbers in order from least to greatest.



The interquartile range is $18 - 12$ or 6.

An **outlier** is a data value that is either much greater or much less than the median. Outliers are more than 1.5 times the value of the interquartile range beyond the quartiles.

Example 2

Find any outliers for the set of data given in Example 1.

The interquartile range is $18 - 12$ or 6.
Multiply the interquartile range by 1.5. $6 \times 1.5 = 9$

Subtract 9 from the first quartile. $12 - 9 = 3$
Add 9 to the third quartile. $18 + 9 = 27$

The limits of the outliers are 3 and 27. The only number of votes beyond the limits is 2. So, 2 is the only outlier.

Exercises

Find the range, median, first and third quartiles, and interquartile range for each data set. Name any outliers.

1. Miles driven to see a Space Shuttle launch: 19, 27, 14, 28, 30, 51, 28
2. Temperatures in Tampa: 91, 92, 88, 89, 93, 95, 65, 88, 91

Lesson 3 Homework Practice

Measures of Variation

1. Use the data in the table.

Weights of Black Bears (lb)									
277	448	279	334	132	599	237	251	183	191

- Find the range of the data.
- Find the median and the first and third quartiles.
- Find the interquartile range.
- Name any outliers in the data.

2. Use the data of average monthly precipitation in Johnstown shown in the table.

Monthly Precipitation

Month	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
Inches	1.71	1.49	1.92	1.93	3.56	9.89	7.34	8.62	8.23	3.80	1.89	1.72

- Find the range of the data.
 - Find the median and the first and third quartiles.
 - Find the interquartile range.
 - Find any outliers in the data and name them.
3. **TRAIN** The table shows the number of riders on the train each day for two weeks. Compare and contrast the measures of variation for both weeks.

Number of Riders on the Train		
Day	Week 1	Week 2
Monday	72	79
Tuesday	84	86
Wednesday	78	75
Thursday	67	49
Friday	86	137