

Name: \_\_\_\_\_  
Date: \_\_\_\_\_

Statistics Lesson 1 – Measures of Center and Spread

What you will learn...how to describe and compare data sets.

EXPLORING DATA SETS!



Avg.  
150  
156.25

1) Michael and Tom have bowled three games. Their scores are shown in the chart below.

| Name    | Game 1 | Game 2 | Game 3 | Average Score |
|---------|--------|--------|--------|---------------|
| Michael | 151    | 153    | 146    | 150 ✓         |
| Tom     | 122    | 139    | 189    | 175 ✓         |

|   |  |  |
|---|--|--|
| <p>a) Complete the table by finding each player's average score. How do the average scores compare?</p> <p>They are the same.</p> | <p>b) Whose game is more consistent? Explain why.</p> <p>Michael had a more consistent score because he had a smaller range of scores.</p> | <p>c) Suppose that in a 4th game, Michael scores 150 and Tom scores 175. How would that affect your conclusions about the average and consistency of their scores?</p> <p>Michael is a more consistent bowler, but Tom has a higher average.</p> |
|---|--|--|

Measures of Center: Mean and Median

Average

Two commonly used measures of center for a set of numerical data are the *mean* and *median*. Measure of center represent a central or typical value of a data set.

- ❖ The *mean* is the sum of the values in the set divided by the number of values in the set.
- ❖ The *median* is the middle value in a set when the values are arranged in numerical order.

2) Find the mean and median for each set of values. SHOW YOUR WORK!!

|   |   |
|---|---|
| <p>a) The number of text messages that Jackie received each day for a week is shown.</p> <p>47, 49, 54, 50, 48, 47, 55</p> <p><del>47</del>, <del>47</del>, <del>48</del>, 49, <del>50</del>, <del>51</del>, <del>55</del></p> <p><math>\frac{350}{7} = 50</math></p> <p>MEAN: 50      MEDIAN: 49</p> | <p>B) The amount of money Andrew earns in tips for six days is listed below.</p> <p>\$75, \$97, \$360, \$84, \$119, \$100</p> <p><del>75</del>, <del>84</del>, 97, 100, <del>119</del>, <del>360</del></p> <p>98.5</p> <p>MEAN: \$139.17      MEDIAN: \$98.50</p> |
|---|---|

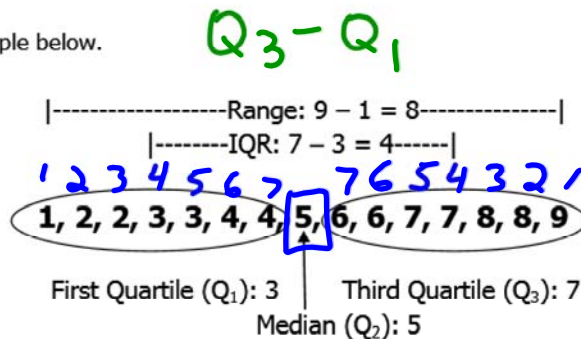
→ Inter Quartile Range

**Measures of Spread: Range and IQR**

Measures of spread describe how data values are spread out from the center. Two common used measures of spread for a set of numerical data are the **range** and **interquartile range**.

- ❖ The **range** is the difference between the greatest and least data values.
- ❖ **Quartiles** are values that divide a data set in four equal parts. The **first quartile ( $Q_1$ )** is the median of the lower half of the set, the **second quartile ( $Q_2$ )** is the median of the whole set, and the **third quartile ( $Q_3$ )** is the median of the upper half of the set.
- ❖ The **interquartile range (IQR)** of a data set is the difference between the third and first quartiles. It represents the range of the middle half of the data.

Study the example below.



Steps for IQR  
 ① Find median = 5

3) Find the median, range, and IQR for each set of values. SHOW YOUR WORK!

|   |  |
|---|--|
| <p>a) The April high temperatures for five years in Boston are 77°F, 86°F, 84°F, 93°F, and 90°F.</p> <p style="text-align: center;"> <math>77, 84, 86, 90, 93</math><br/> <math>\quad \quad \quad \uparrow</math><br/> <math>80.5 \quad \quad \quad 91.5</math><br/> <math>\quad \quad \quad \uparrow \quad \quad \quad \uparrow</math><br/> <math>Q_1 \quad \quad \quad Q_2 \quad \quad \quad Q_3</math><br/> <br/> <b>Med - 86</b><br/> <b>Range - 16</b><br/> <b>IQR - <math>91.5 - 80.5 = 11</math></b> </p> <p>MEDIAN:      RANGE:      IQR:</p> | <p>b) The numbers of home runs for the 10 batters who hit the most home runs during the 2005 Major League Baseball regular season.</p> <p style="text-align: center;"> <math>51, 48, 47, 46, 45, 43, 41, 40, 40, 39</math><br/> <math>39, 40, 46, 41, 43, 45, 46, 47, 48, 51</math><br/> <math>\quad \quad \quad \uparrow \quad \quad \quad \uparrow \quad \quad \quad \uparrow</math><br/> <math>Q_1 \quad \quad \quad Q_2 \quad \quad \quad Q_3</math><br/> <br/> <b>IQR: 7</b><br/> <b>Range: <math>51 - 39 = 12</math></b> </p> <p>MEDIAN:      RANGE:      IQR:</p> |
|---|--|