

4/25/17 CCM6+

Understand how the shape of data and outliers affect mean, median, mode and range.

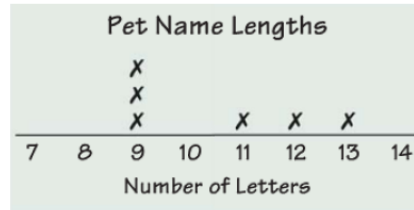
Describe the shape of data.

1. Agenda...HW is pages 14, 17, 18
2. Get out p.12 to check

✓ CW/HW

Investigating Statistics...What numbers affect the MEAN?

Susan has six pets. She made the line plot to show the lengths of her pets' names.



Describe the SHAPE of the data.

skewed left

What is the mean of the data above?

$$\frac{63}{6}$$

10.5

If you add a 1 letter pet name, what will be the new mean?

9.14

$$\frac{64}{7}$$

What will be the new median?

9

How did a low data value change the mean?

went down

How did a low data value change the median?

" " 10 → 9

If you remove the 1 and replace it with a 25, what will be the new mean?

12.57

↑

What will be the new median?

11 10 → 11

How did a high data value change the mean?

↑ 10.5 - 12.57

How did a high data value change the median?

↑ less

Do very high or very low data values far away from the other data (outliers) change the mean or median more? ✓

When there is an outlier, which measure of center would be better to use for that set of data?

median ✓

When there is no outlier, which measure of center would be better to use for that set of data?

either

Which is better when there's an outlier--mean or median?

Grades: ~~40~~, 86, 89, | 99, 100

	with outlier	without outlier
mean	$\frac{414}{5} = 82.8$	$\frac{374}{4} = 93.5$
median	89	94

Investigating Statistics: How does the **SHAPE** of the data affect the center?

PEAK ... CLUSTER ... SKEWED ... SYMMETRICAL ... GAP

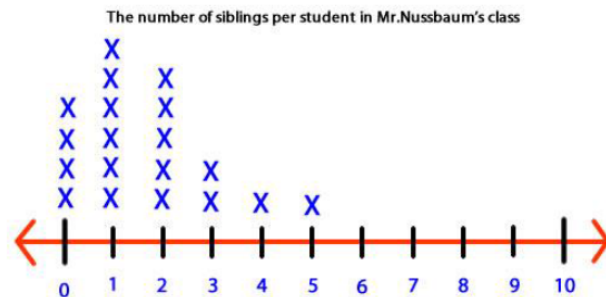
Describe the shape of the data in the line plot to the right.

Mean = _____

Median = _____

Mode = _____

Range = _____



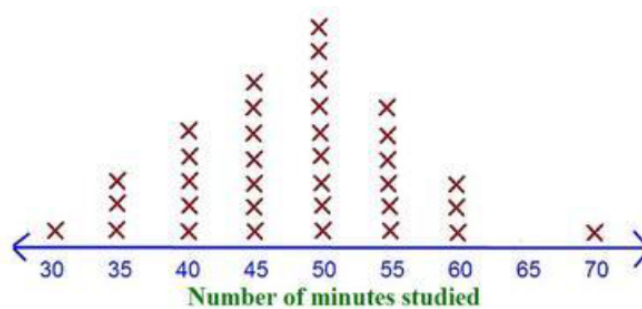
Describe the shape of the data in the line plot to the right.

Mean = _____

Median = _____

Mode = _____

Range = _____



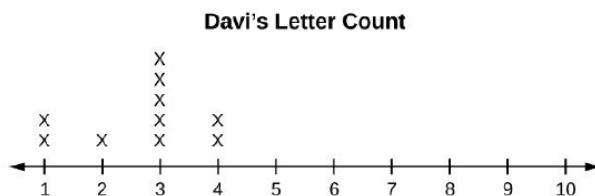
Describe the shape of the data in the line plot to the right.

Mean = _____

Median = _____

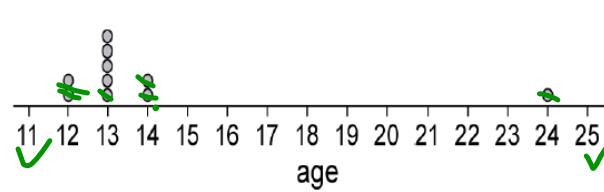
Mode = _____

Range = _____



Describe the shape of the data in the line plot to the right.

Mean = $\frac{141}{10} = 14.1$ Median = 13
 Mode = 13 Range = 12



Which measures are affected most by the outlier? mean, range

HW

PRACTICE

1.

Jessica's History Test Scores	81	97	99	89	91	50
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Range: _____

Mean: _____

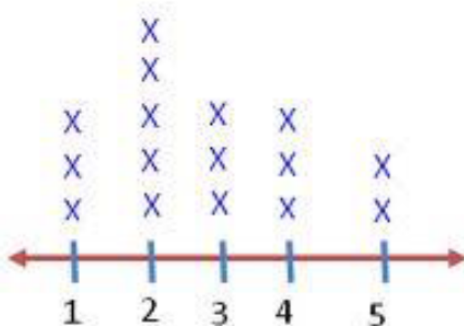
Median: _____

Mode: _____

Which measure of center is best for Jessica—mean or median? Explain.

2. On an exam, three students scored 75, four students scored 82, three students scored 88, four students scored 93, and one student scored 99. If the answer is 88, what is the question? *Hint: Write the scores out!*

3. Find the mean, median, mode, and range of the dot plot.



Mean: _____

Median: _____

Mode: _____

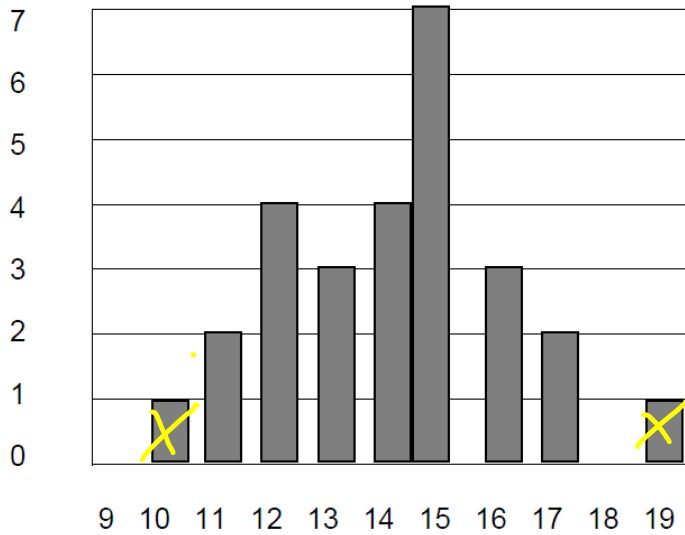
Range: _____

For the line plot, is mean or median a better measure of center? Explain.

The two graphs below show students' name lengths in two classes.



Ms. Campo's class:



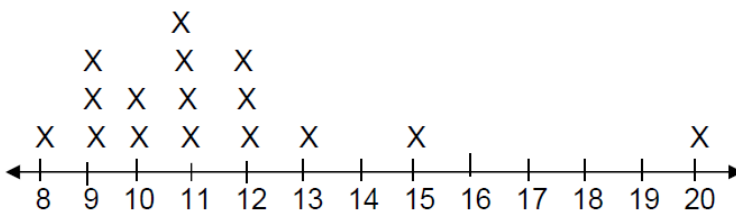
Mean = $\frac{381}{27} = 14.1$

Median = 14

Mode = 15

Range = 9

Mr. Young's class:



Mean = _____

Median = _____

Mode = _____

Range = _____

1. What is the typical name length for:

a) Ms. Campo's class.

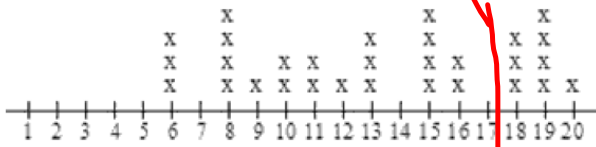
b) Mr. Young's class.

2. Find the mean, median, mode, and range for both classes in the boxes above.

3. How does the data distribution (SHAPE) compare between these two classes?

3. Since Mr. Young's class data has an outlier, which measure best represents his data?

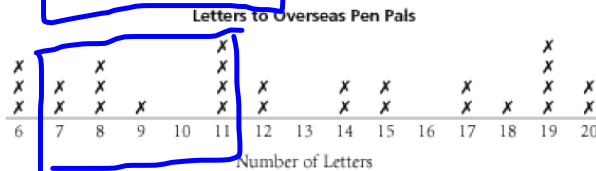
1. The line plot below represents the number of letters written to overseas pen pals by the students at Waverly Middle School. Each "x" represents 10 students. How many students wrote 18 or more letters?



8×10

- A) 250 B) 8 C) 30 D) 80

2. The line plot below represents the number of letters written to overseas pen pals by the students at Waverly Middle School. Each "x" represents 10 students. How many students wrote more than 6 and fewer than 12 letters?



10×10

- A) 110 B) 120 C) 100 D) 90

3. Thirteen bowlers were asked what their score was on their last game. The scores are shown below.

183, 152, 155, 181, 176, 193, 171, 170, 186, 170, 187, 159, 183

Find the range of the bowlers' scores.

- A) 20 B) 41 C) 53 D) 31

4. A group of friends tested themselves to see how many times each person could hit a tennis ball against the wall without missing. The results are below:

7 15 28 8 21 30 30 10
 22 4 17 7 17 22 10 8

Find the range of the data set.

- A) 26 B) 16 C) 36 D) 23

5. Thirteen bowlers were asked what their score was on their last game. The scores are shown below.

190, 150, 154, 194, 182, 190, 170, 151, 190, 170, 178, 161, 180

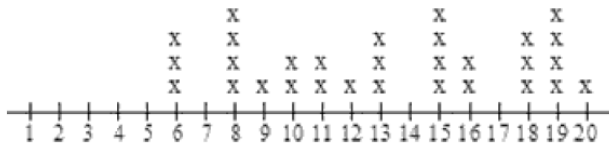
Find the range of the bowlers' scores.

- A) 56 B) 44 C) 34 D) 23

HW

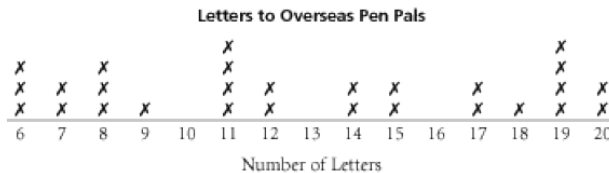
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6. The line plot below represents the number of letters written to overseas pen pals by the students at Waverly Middle School. Each "x" represents 10 students. How many students wrote 14 or more letters?



- A) 140 B) 160 C) 0 D) 14

7. The line plot below represents the number of letters written to overseas pen pals by the students at Waverly Middle School. Each "x" represents 10 students. How many students wrote more than 6 and fewer than 20 letters?



- A) 250 B) 240 C) 230 D) 220

8. A group of friends tested themselves to see how many times each person could hit a tennis ball against the wall without missing. The results are below:

8	13	22	8	18	28	28	12
25	6	15	8	15	25	12	8

Find the range of the data set.

- A) 19 B) 22 C) 32 D) 12

9. A group of friends tested themselves to see how many times each person could hit a tennis ball against the wall without missing. The results are below:

7	11	25	7	25	23	23	15
21	7	12	7	12	21	15	7

Find the range of the data set.

- A) 28 B) 8 C) 18 D) 15

HW

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10. Thirteen bowlers were asked what their score was on their last game. The scores are shown below.

192, 158, 154, 195, 180, 183, 188, 151, 180, 185, 184, 166, 184

Find the range of the bowlers' scores.

- A) 56 B) 34 C) 23 D) 44

11. Which measure is affected **MOST** by an outlier?

- A) mean B) median C) mode

Why? _____

12. Which measure is affected **LEAST** by an outlier?

- A) mean B) median C) mode

Why? _____

13. How is a bar graph like a line plot (dot plot)?

14. What kind of data is best for the mode? the median? the mean?