

1. Fill in each blank with *always*, *sometimes*, or *never* to make a true statement.
 - a. The median and the mean of a set are **SOMETIMES** equal.
 - b. An outlier will **ALWAYS** increase the standard deviation of a set.
 - c. If a distribution is skewed right, the median will **NEVER** be greater than the mean.
 - d. If you add two outliers to a data set, the mean will **SOMETIMES** change.
 - e. If you add two outliers to a data set, the median will **SOMETIMES** change.

2.

Chapter 6 Test Scores		
	Class A	Class B
Mean	79	80
Median	81	84.5
Standard Deviation	15.0	14.1

Estimate the mean and median of the distribution. Then, tell whether the distribution is skewed left, skewed right, or symmetric.

3. *Est Mean = 52 Est Median = 48*

Your estimations may be a little different, but your mean should be greater than the median because it is skewed right.

4.

Est Mean = Median = 44

Your estimations may be a little different, but your mean should be equal to the median because it is symmetric.

5.

Est Mean = 2.5 Est Median = 1

Your estimations may be a little different, but your mean should be greater than the median because it is skewed right.

6. **Price of Books**

No need to estimate mean, median because they are given. The mean is less than the median because it is skewed left.

Est Mean = 125 Est Median = 127

9. *Your estimations may be a little different, but your mean should be less than the median because it is skewed left.*

7. **Cost of Meal**

No need to estimate mean, median because they are given. The mean is greater than the median because it is skewed right.

Est Mean = 102 Est Median = 99

10. *CAREFULL! The Stem on the plot is DECREASING!! Your estimations may be a little different, but your mean should be greater than the median because it is skewed right.*

8.

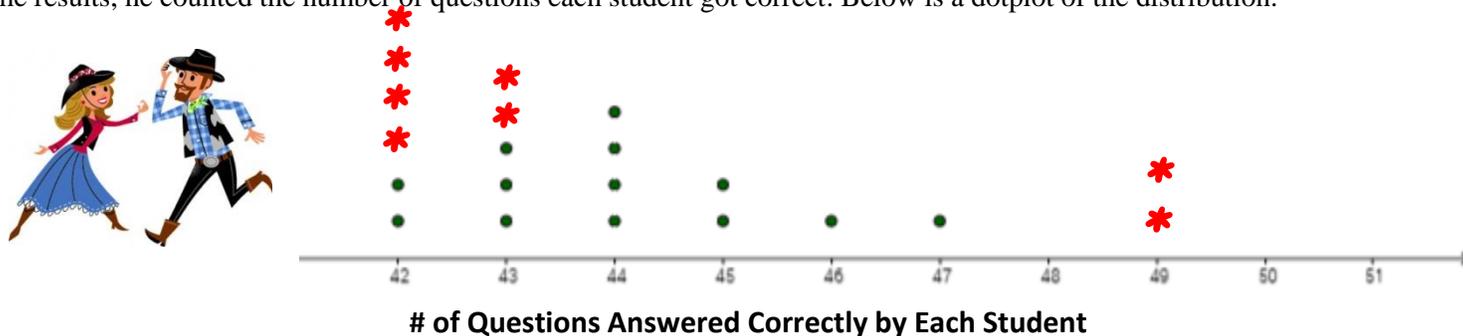
Est Mean = 5 = Median

Your estimations may be a little different, but your mean should be equal to the median because it is symmetric.

Est Mean = 25 Est Median = 20

11. *Your estimations may be a little different, but your mean should be greater than the median because it is skewed right.*

12. At one time, Mr. Bean taught history. One, day Mr. Bean decided to give a 55-question test on the *History of Midwestern Square Dancing*. Unfortunately, a large part of Mr Bean's class was absent, yet he decided to give the test anyway. Interested in the results, he counted the number of questions each student got correct. Below is a dotplot of the distribution:



a. Describe the shape of the distribution. Do you expect the mean or the median to be higher? Explain.
The shape is looks pretty much symmetric. Therefore, the mean is about equal to the median. (44)

b. Find each to confirm your thoughts → Mean = 44 Median = 44

c. The next class, 8 of the 9 absent students came back to school and took the test. The number of correct questions for those additional 8 students were: 49, 42, 43, 42, 42, 43, 42, 49. Plot these additional scores on the dotplot above.

d. Did adding these values change the shape of the distribution? Explain.

Yes. The shape now appears to be skewed to the right because the data values are more spread out on the right.

e. Find the new mean and median of the data set including the absent students' scores. Do your findings support your answer to (d.) above? Why or why not?

Yes. The median has fallen to 43 while the mean score has remained at 44. This supports our statement that the shape is now skewed right.

f. Mr. Bean's last absent student, Abby, finally comes back to school. Abby is from Nebraska and is well-versed in *Midwestern Square Dancing*. In fact, Abby gets all 55 questions correct and Bean quickly adds her score to his distribution! Which measure will Abby's score affect the most: the mean, or the median?

Because the median is not affected by outliers, only the mean will change. The mean will increase.

g. Do you believe Abby's score is an outlier? Explain.

Yes. A score of 55 is well above the other scores. Therefore, that score is an outlier.

13. Multiply: $(2x - 5)^2$

$$\begin{aligned} &(2x - 5)(2x - 5) \\ &= 4x^2 - 10x - 10x + 25 \\ &= 4x^2 - 20x + 25 \end{aligned}$$

14. Solve the following equation for w: $\frac{rt}{w} = a - b$

$$\begin{aligned} &\text{Multiply both sides by } w \\ &\text{Then, divide both sides by } (a - b) \end{aligned} \quad \begin{aligned} &rt \\ W &= \frac{rt}{(a - b)} \end{aligned}$$

15. Solve the following system:

$$\begin{cases} -x + y = -4 & \text{Mult by } (2) & -2x + 2y = -8 \\ 2x + 2y = -12 & & 2x + 2y = -12 \end{cases} \quad \begin{aligned} -x + (-5) &= -4 \\ -x &= 1 \\ x &= -1 \end{aligned}$$

$$\begin{aligned} \text{Sol: } &(-1, -5) & 4y &= -20 \\ & & y &= -5 \end{aligned}$$