

CDC Writing

Question - Will the mean or median increase if the last number in the data set is increased?

Claim - In a data set, if the last number is increased the mean (the average) will increase. However, in the median if the last number in the data set increases the median will not change.

Data -

Ex Problem -

Data set - 5, 6, 9, 10, 12

Without Increase:

Mean: 8.4

Median: 9

$\frac{5, 6, 9, 10, 12}{5}$

$5, 6, 9, 10, 12$

$$= \frac{42}{5} = 8.4$$

CDC Writing

With Increase:

Data Set - 5, 6, 9, 10, 22,

Mean: 10.4

Median: 9

$$\frac{5, 6, 9, 10, 22}{5} = \frac{52}{5} = 10.4$$

5, 6, 9, 10, 22

Commentary - In this question we find 3 things mentioned mean, median, and data sets. In order to understand the question you have to understand these. A data set is all the numbers included in the data. In the Example Problem I have given the data set is 9, 10, 5, 6, 12.

The mean is the average. To find mean you have to add all the values in the data set and divide them by the amount of data values. For example in this problem you have to add 5, 6, 9, 10, and 12 and then divide them by 5 (how many there are).

Finally, mean is the middle number. To find median the first step is to place the data in the correct order. You then have to find the number right in

CDC Writing

2.20

The middle. To do this you have to count how many numbers there are. If you have an odd number of values than the median is the number right in the middle. If there are an even number of values the median is the mean of the 2 middle values.

Now that you understand these terms we are going to go step by step through this question. This question is asking that if the last number in a data set is increased will the mean or median increase. The answer to this question is yes and no (as said in the claim) and we are about to figure out why.

In the example problem I have given the data set is 9, 10, 5, 6 and 12. The first thing you have to do is find the mean which is 8.4 (using the method described in the first paragraph). This will be helpful in the future so that when you add the increase you will see if the mean changes or not. The second thing you have to do is you have to find the median which is 9 (using the method described in the first paragraph). This will also help you in the future to see if the median changes after the increase.

CDC Writing 224

Now that you have found the original mean and median you are going to find the mean and median after the last number in the data set has increased. In this case the last number in the data set is 12 so I am going to increase it by 10, to get 22 if you are going to make your own problem or try it out using a different data set you can increase it by anything but for this problem I am just going to use 10. After you have changed the data set to 9, 10, 5, 6, 22. You can find the mean which is now 10.4 (using the method described in the first paragraph). Next, you should find the median of the new data set which should now be 9 (using the method described in the first paragraph). Finally, you have to compare the mean and median without the increase to the mean and median with the increase.

	With increase:	Without increase:
Mean-	10.4	8.4
median-	9	9

Same number

CDC Writing

226

You should notice from this that the median stayed the same and the difference in the mean is that without the increase (18.4) increases by 2 to 10.4 (the with the increase number). This change in number is called an outlier, a number larger or smaller than the rest of the data set. The outlier changes the mean depending on what side of the data set it is on. If it is on the higher end of the data set the mean increases if it is on the lower end it decreases. You should also know that changing a number to an outlier does not change the median however if you add a number the median will change. Now you know how to answer this question.

— Tabytha Hartland ☺