

A company is shooting a commercial and asked two different modeling agencies to send them a group of 5 models with an average age 17.



The company “**Modeling Marvels Agency**” sent 5 models with the following ages: **16, 16, 15, 17, and 21.**

The company “**Acting Up Models Inc.**” sent 5 models with the following ages: **3, 5, 6, 31, and 40.**

1. Did each company correctly send a group of 5 models with an average age of 17?

2. What would you describe as being the most different between the two groups and how might you quantify this?

Two competing companies design similar android phones. A magazine is writing a review on the two companies and sampled 7 phones from each company to determine their battery life to the nearest hour while watching streaming videos:

Simsong’s Universe 4 Android Phone Battery life sample: 3 hrs, 3 hrs, 4 hrs, 5 hrs, 6 hrs, 7 hrs, 7 hrs

Motovola’s Void 5 Phone Battery life sample: 1hr , 1hr, 2hrs , 6hrs , 8hrs, 10hrs, 14hrs



3. What is the **mean** of each sample of phones?

4. What is the **median** of each sample of phones?

5. What is the **range** of each sample of phones?

6. What is the **lower quartile (Q1)** of each sample of phones?

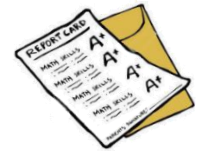
7. What is the **upper quartile (Q3)** of each sample of phones?

8. What is the **interquartile range (IQR)** of each sample of phones?

A math teacher must make a recommendation for a \$2000 scholarship to a local chamber of commerce. The teacher has two students in mind **Alan** and **Brianna**. The teacher decides to let their grades be the determining factor. Here are their test scores for the semester:



Alan: 90, 90, 80, 100, 99, 81, 98, 82 **Brianna:** 90, 90, 91, 89, 91, 89, 90, 90



- Which student has the higher arithmetic **mean**, (average (\bar{X}))?
- Which student has the higher **median**?
- What might be the problem of using these measures of central tendency?
- What is **RANGE** of the data set?
- What is the **IQR** of each data set?
- Consider using the measures of variability (or measures of spread) as a possible determining factor for the scholarship recipient.

a. Find Mean Deviation

$$\left(\frac{\sum_{i=1}^n |X_i - \bar{X}|}{n} \right)$$

b. Find Variance, σ^2 .

$$\left(\frac{\sum_{i=1}^n (X_i - \bar{X})^2}{n} \right)$$

c. Find Standard Deviation.

$$\left(\sqrt{\frac{\sum_{i=1}^n (X_i - \bar{X})^2}{n}} \right)$$

Alan's Data (X_i)	$X_i - \bar{X}$	$ X_i - \bar{X} $	$(X_i - \bar{X})^2$
90			
90			
80			
100			
99			
81			
98			
82			

Brianna's Data (X_i)	$X_i - \bar{X}$	$ X_i - \bar{X} $	$(X_i - \bar{X})^2$
90			
90			
91			
89			
91			
89			
90			
90			

MEANS:

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Should be Zero

Mean Deviation

Variation

Standard Deviation

MEANS:

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Should be Zero

Mean Deviation

Variation

Standard Deviation

7. What does the difference in the measures of variability (spread) suggest?

8. Using your measures, explain which student you think the teacher should choose and why.



Alan

OR



Brianna

9. Matching:

_____ Has a standard deviation of 0.

A. 1, 7, 1, 7, 7, 1

_____ Has a standard deviation of 1.

B. 1, 3, 1, 3, 1, 3

_____ Has a standard deviation of 2.

C. 4, -2, 8, 2, 4, 2

_____ Has a standard deviation of 3.

D. 1, 1, 1, 1, 1, 1

E. 5, 5, 5, 1, 1, 1

10. Can you make a data set of 6 elements that has a standard deviation of 4?

11. The table below shows the scores of the last 6 based ball games.

Winning Score	5	2	6	9	5	3
Losing Score	3	1	2	2	4	0

The winning margin for each game is the difference between the winning score and the losing score. What is the standard deviation of the winning margins for these data?

12. The following shows the shoes sizes of the students in a class

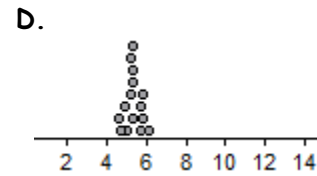
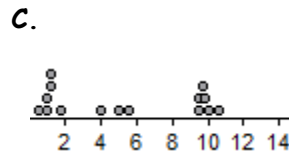
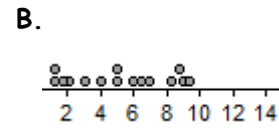
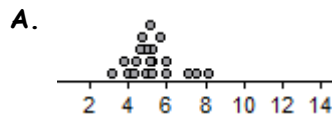
Shoe Size	7	8	9	10	11	12
Frequency	1	2	4	3	2	2

What is the standard deviation of this data set?

What is the range of the data set?

13. Matching: Use the following dot plots to estimate which of each of the following distributions corresponds to which given standard deviation?

- a. $\sigma \approx 0.43$
- b. $\sigma \approx 1.22$
- c. $\sigma \approx 2.91$
- d. $\sigma \approx 4.08$



14. The following represents the grades of each student on a test
31 79 97 70 70 79

Find the MEAN:

Find the MEDIAN:

Find the MODE:

Which the most appropriate central tendency to use to describe the data set? and Why?

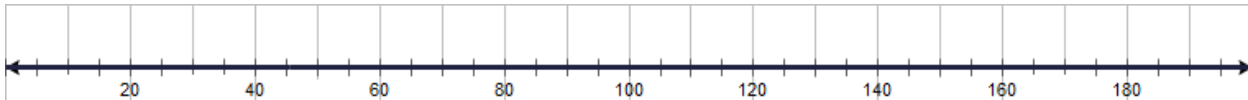
Find the RANGE:

Find the ABS. MEAN DEV.:

Find the STANDARD DEV.:

Data	Mean	Deviation	Deviation	Deviation ²
31				
79				
97				
70				
70				
79				

Create a Dot Plot of the data:



The teacher thought the class average was too low and decided to curve the tests 5 points. Add 5 points to everyone's grade and re-valuate the following:

MEAN:

MEDIAN:

MODE:

RANGE:

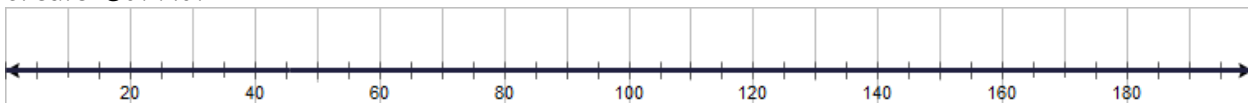
ABS. MEAN DEV.:

STANDARD DEV.:

Data	Mean	Deviation	Deviation	Deviation ²
36				
84				
102				
75				
75				
84				

Describe how each statistic changed.

Create Dot Plot



What do you think would happen to each of the statistics if the teacher decided to double each student's score?

Create a Dot Plot of each score being doubled.

