

Algebra II

Introduction to Standard Deviation

Name _____

Hour _____

On the number lines below, make a dot plot of each data set. Mark the mean and median for the data set on each number line. State the range of each data set.

Data Set A: 6, 6, 8, 10, 10

Data Set B: 14, 14, 16, 18, 18

Data Set C: 6, 6, 6, 8, 10, 10

Data Set D: 6, 6, 8, 10, 20

Set A:



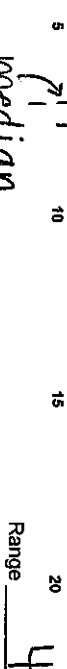
mean & median

Set B:



mean & median

Set C:



$\frac{46}{6} = 7.\bar{6}$

median

mean

Set D:



$\frac{50}{5} = 10$

median

Range 14

Calculate the Standard Deviation of a Population (σ) for each data set and write this value under the range on page one.

Data Set A

Data	Mean	Data - Mean	(Data - Mean) ²
6	8	-2	4
6	8	-2	4
8	8	0	0
10	8	2	4
10	8	2	4

always positive

Sum (Σ) of (Data - Mean)² = 16

$\frac{\text{Sum of (Data-Mean)}^2}{\text{Number of Data Points}} = \frac{16}{5} = 3.2$

$\sigma = \sqrt{\frac{\text{Sum of (Data-Mean)}^2}{\text{Number of Data Points}}} = 1.79$

Data Set B

Data	Mean	Data - Mean	(Data - Mean) ²
14	16	-2	4
14	16	-2	4
16	16	0	0
18	16	2	4
18	16	2	4

Sum (Σ) of (Data - Mean)² = 16

$\frac{\text{Sum of (Data-Mean)}^2}{\text{Number of Data Points}} = \frac{16}{5} = 3.2$

$\sigma = \sqrt{\frac{\text{Sum of (Data-Mean)}^2}{\text{Number of Data Points}}} = 1.79$

Data Set C

Data	Mean	Data - Mean	(Data - Mean) ²
6	7.7	-1.7	2.89
6	7.7	-1.7	2.89
6	7.7	-1.7	2.89
8	7.7	0.3	.09
10	7.7	2.3	5.29
10	7.7	2.3	5.29

$$\text{Sum } (\Sigma) \text{ of (Data - Mean)}^2 = 19.34$$

$$\frac{\text{Sum of (Data - Mean)}^2}{\text{Number of Data Points}} = \frac{19.34}{6} = 3.2$$

$$\sigma = \sqrt{\frac{\text{Sum of (Data - Mean)}^2}{\text{Number of Data Points}}} = 1.80$$

Data Set D

Data	Mean	Data - Mean	(Data - Mean) ²
6	10	-4	16
6	10	-4	16
8	10	-2	4
10	10	0	0
20	10	10	100

$$\text{Sum } (\Sigma) \text{ of (Data - Mean)}^2 = 136$$

$$\frac{\text{Sum of (Data - Mean)}^2}{\text{Number of Data Points}} = \frac{136}{5} = 27.2$$

$$\sigma = \sqrt{\frac{\text{Sum of (Data - Mean)}^2}{\text{Number of Data Points}}} = 5.22$$

Write a formula for calculating the Standard Deviation of a Population.

$$\sigma = \sqrt{\frac{\Sigma (\text{data} - \text{mean})^2}{\text{number of datapoints}}}$$

Describe the relation between the standard deviation and the data set. Refer to specific data sets in your description.

The more closely clustered around the mean the data is, the smaller the σ . A long tail gives a greater σ .

Define Standard Deviation.

The spread of the data.