

# Variance and Standard Deviation

Variance- Square of the deviation

Standard Deviation- Square root of the variance. It shows how much variation exists from the mean. Symbol =  $\sigma$

A low standard deviation indicates that the data points tend to be very close to the mean, whereas high standard deviation indicates that the data points are spread out over a large range of values.

The data from the Ch. 8 Geometry test scores are as follows: 89, 97, 90, 98, 60, 77, 77, 100

Step One: Find the mean

$\mu =$  \_\_\_\_\_

Step Two: Figure out the deviation. The deviation is \_\_\_\_\_.

Test Score	Deviation ( $x - \mu$ )	Square of the Deviation ( $x - \mu$ ) <sup>2</sup>
89		
97		
90		
98		
60		
77		
77		
100		
$\mu =$	$\mu =$	$\mu =$

Step Three: Some of these values are negative...How can we make them positive?

Find the \_\_\_\_\_ OR \_\_\_\_\_.

Find the square for each deviation for each number.

Step Four: Find the mean of the squares of the deviations or the **VARIANCE**.

Step Five: The square root of the Variance is the standard deviation or  $\sigma$ !

$$\sqrt{\quad} = \sigma = \text{_____}$$

Example: Find the variance and standard deviation for the following data: 12, 15, 17, 19, 21, 11

$$\mu = \underline{\hspace{2cm}}$$

$$\text{Variance} = \underline{\hspace{2cm}}$$

$$\sigma = \underline{\hspace{2cm}}$$

Try these on your own:

1. Find the variance and standard deviation for the following data: 3, 4, 5, 6, 7, 8, 9, 10

$$\mu = \underline{\hspace{2cm}}$$

$$\text{Variance} = \underline{\hspace{2cm}}$$

$$\sigma = \underline{\hspace{2cm}}$$

2. Find the variance and standard deviation for the following data: 100, 200, 300, 400, 500, 600

$$\mu = \underline{\hspace{2cm}}$$

$$\text{Variance} = \underline{\hspace{2cm}}$$

$$\sigma = \underline{\hspace{2cm}}$$

3. Find the variance and standard deviation for the following data: 91, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101

$$\mu = \underline{\hspace{2cm}}$$

$$\text{Variance} = \underline{\hspace{2cm}}$$

$$\sigma = \underline{\hspace{2cm}}$$