Name: _____

# 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 $(x - \mu)^2$ |
|---|---|---|
| 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 $\sigma$!

$$\sqrt{\phantom{xxxx}} = \sigma = \text{_____}$$

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

$\mu =$ _____

Variance = _____

$\sigma =$ _____

Try these on your own:

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

   $\mu =$ _____

   Variance = _____

   $\sigma =$ _____

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

   $\mu =$ _____

   Variance = _____

   $\sigma =$ _____

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

   $\mu =$ _____

   Variance = _____

   $\sigma =$ _____