

1-7 Standard Deviation

Objectives:

- To find the standard deviation and variance of a set of values.
- To apply standard deviation and variance.

Common Core Content Standard:

S.ID.4 Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages.

Also S.IC.6

_____ and _____ are measures showing how much data values deviate from the mean. The Greek letter σ (sigma) represents standard deviation. σ^2 (sigma squared) is the variance.

Take note**Key Concepts Finding Variance and Standard Deviation**

- Find the mean, \bar{x} , of the n values in a data set.
- Find the difference, $x - \bar{x}$, between each value x and the mean.
- Square each difference, $(x - \bar{x})^2$.
- Find the average (mean) of these squares. This is the variance.

$$\sigma^2 = \frac{\sum(x - \bar{x})^2}{n}$$

- Take the square root of the variance. This is the standard deviation.

$$\sigma = \sqrt{\frac{\sum(x - \bar{x})^2}{n}}$$

Example 1: Finding Variance and Standard Deviation

What are the mean, variance, and standard deviation of these values?

6.5 5.8 3.9 5.7 4.2

Example 2: Using a Calculator to Find Standard Deviation

The table displays the number of sales a salesperson made each month during the past 15 months. What are the mean and standard deviation?

Month	Sales
1	4
2	3
3	5
4	4
5	6
6	8
7	1
8	3
9	2
10	5
11	6
12	4
13	7
14	5
15	3

Example 3: Using Standard Deviation to Describe Data

Use the sales data from Exercise 2. Within how many standard deviations of the mean do all of the values fall?