

Name:

Statistics Worksheet: Variance and Standard Deviation

1. Calculate the sample variance and the sample standard deviation for the following set of scores: 1, 1, 0, 4. Note that these data have a SS of 9.

Steps:

- To find the variance, recall that the equation is $s^2 = \frac{SS}{n-1}$
- We already know that $SS = 9$ and $n = 4$.

$$s^2 = \frac{SS}{n-1} = \frac{9}{4-1} = \frac{9}{3} = 3$$

- To find the standard deviation, recall that the equation is $s = \sqrt{\frac{SS}{n-1}}$ or $\sqrt{s^2}$

$$s = \sqrt{3} = 1.7320508$$

- If we round to the second decimal place then $s = 1.73$

2. A set of scores ($n = 10$) has a $SS = 90$. What is the sample variance and sample standard deviation?

Steps:

- To find the variance, recall that the equation is $s^2 = \frac{SS}{n-1}$
- We already know that $SS = 90$ and $n = 10$.

$$s^2 = \frac{SS}{n-1} = \frac{90}{10-1} = \frac{90}{9} = 10$$

- To find the standard deviation, recall that the equation is $s = \sqrt{\frac{SS}{n-1}}$ or $\sqrt{s^2}$

$$s = \sqrt{10} = 3.1622776$$

- If we round to the second decimal place then $s = 3.16$

3. If the sample standard deviation of a set of scores ($n = 6$) is 3, what is the SS and the S^2 ?

- To find the variance when given the standard deviation, recall that the equation for a sample standard deviation is $\sqrt{\frac{SS}{n-1}}$ or $\sqrt{S^2}$
- Thus, we can find the variance by raising 3 to the second power, or, squaring it.
 $s^2 = 3^2 = 9$
- To find SS, recall that the equation for sample variance is $S^2 = \frac{SS}{n-1}$

$$9 = \frac{SS}{6-1} \quad 9 = \frac{SS}{5} \quad 9 \times 5 = SS \quad 45 = SS$$