What is Standard Deviation?

Worksheet

Standard deviation () is the square root of the average squared deviation from the mean: = ((x)/n). A larger means more spread-out data.

$$@sigma = @sqrt{@frac{@sum(x - @mu)^2}{n}}$$

Questions

1. A data set has variance 16. What is its standard deviation?

A) 2
B) 4
C) 8
D) 16

2. What is the standard deviation of 5, 5, 5, 5?

A) 0
B) 1
C) 5
D) Undefined

3. Which best describes standard deviation?

A) The average of the data
B) The spread of data around the mean
C) The most frequent value
D) The middle value

4. As data spread increases, standard deviation

A) Decreases
B) Increases
C) Stays the same
D) Becomes negative

5. Find the standard deviation of: 2, 4, 4, 4, 5, 5, 7, 9.

6. Find the standard deviation of test scores: 60, 70, 80, 90, 100.

7. A data set has variance 25. What is its standard deviation?

8. Define: What does standard deviation measure?

9. Define: Formula for standard deviation?

10. Define: Relationship between variance and SD?

Answer Key

1. B) 4 - 16 = 4.
2. A) 0 - All values equal the mean, so there's no spread - SD = 0.
3. B) The spread of data around the mean - Standard deviation measures spread around the mean.
4. B) Increases - More spread means a larger standard deviation.
5. Mean = (2+4+4+4+5+5+7+9)/8 = 5 Squared deviations: 9,1,1,1,0,0,4,16 (sum = 32) Variance = 32/8 = 4 SD = 4 = 2
6. Mean = 80 Squared deviations: 400,100,0,100,400 (sum = 1000) Variance = 1000/5 = 200 SD = 200 14.14
7. Variance = 25 SD = 25 = 5
8. How spread out data values are from the mean.
9. = ((x)/n) - the square root of variance.
10. SD is the square root of variance; variance is SD squared.