

What is Variance?

Worksheet

Variance () is the average of the squared differences from the mean: $\frac{\sum(x - \mu)^2}{n}$. It's always 0, and a larger variance means more spread-out data.

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

Questions

1. What is the variance of 1, 2, 3, 4, 5?
A) 1
B) 2
C) 4
D) 10
2. A data set has standard deviation 3. What is its variance?
A) 3
B) 6
C) 9
D) 1.73
3. What are the units of variance compared to the original data?
A) Same units
B) Squared units
C) No units
D) Half the units
4. If all data values are equal, the variance is
A) 0
B) 1
C) Undefined
D) Equal to the mean
5. Find the variance of: 2, 4, 4, 4, 5, 5, 7, 9.
6. Find the variance of: 4, 8, 6, 5, 3.
7. A data set has standard deviation 6. What is its variance?
8. Define: What is variance?
9. Define: How is variance related to standard deviation?
10. Define: Can variance be negative?

Answer Key

1. B) 2 - Mean=3, sum of squared deviations=10, variance=10/5=2.
2. C) 9 - Variance = 3 = 9.
3. B) Squared units - Variance is in squared units because deviations are squared.
4. A) 0 - No spread from the mean means variance = 0.
5. Mean = 5 Squared deviations: 9,1,1,1,0,0,4,16 (sum = 32) Variance = 32/8 = 4
6. Mean = (4+8+6+5+3)/5 = 5.2 Squared deviations: 1.44, 7.84, 0.64, 0.04, 4.84 (sum = 14.8) Variance = 14.8/5 = 2.96
7. SD = 6 Variance = SD = 6 = 36
8. The average of the squared deviations from the mean: = $(x)/n$.
9. Standard deviation is the square root of variance: = .
10. No - squared terms make variance always 0.

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