

# VARIANCE FORMULA

Variance is one of the most important generalities in statistics. It measures how important the values in a dataset differ from the mean or the normal. Understanding variance can help you dissect data, identify patterns, and make informed opinions. In this composition, you will learn what variance is, how to calculate it, and what its parcels and operations are.

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#### Q1: What is the symbol commonly used to represent variance?

A: A) σ B: B) Σ C: C) δ

D: D) V

#### Q2: In a dataset, if all values are identical, what would the variance be?

A: A) Zero B: B) Negative C: C) Undefined D: D) Infinite

## Q3: Statistical measure that determines whether the data is homogeneous or heterogeneous

A: A) Variance

B: B) Derivatives

C: C) Addition

D: D) Matrices

#### Q4: What connection exists between variance and standard deviation?

A: A) The standard deviation is the variance squared.

B: B) The square of variance is the standard deviation.

C: C) Standard deviation is the inverse of variance.

D: D) Standard deviation is unrelated to variance.

#### Q5: What is the variance when a constant is added or subtracted from all values?

A: A) It increases the variance by the constant.

B: B) It decreases the variance by the constant.

C: C) It does not affect the variance.

D: D) It depends on the sign of the constant.



# Q6: What is the effect of multiplying or dividing all values by a constant on variance?

A: A) It increases the variance by the constant.

- B: B) It decreases the variance by the constant.
- C: C) It increases or decreases the variance by the square of the constant.
- D: D) It does not affect the variance.

## Q7: What is an illustration of how variance is used in finance in the real world?

A: A) Demonstrating the potential deviation of returns from the expected value to gauge the risk of an investment.

B: B) Measuring the profitability of a business by showing how much the revenue can exceed or fall short of the expenses.

C: C) Demonstrating how quickly an asset can be turned into cash to gauge its liquidity.

D: D) Calculating the rate of inflation by displaying the range of price fluctuations over time.

## Q8: What is an instance of a scientific application of variance in the real world?

A: A) Determining how much an experiment's results can deviate from the hypothesis to gauge its accuracy.

B: B) Determining a system's complexity by counting the variables and interactions inside it.

C: C) Determining a population's diversity by counting the variety of species and characteristics it possesses.

D: D) Determining how much a species can adapt to changes in its environment to gauge its evolutionary progress.

#### Q9: What is an instance of an engineering application of variance in practice?

A: A) Determining how much a product can stray from the requirements to gauge its quality.

B: B) Determining how much a process can cut costs and waste to gauge its efficiency.

C: C) Measuring a design's innovation by demonstrating how much its utility and performance can be enhanced.

D: D) Determining a structure's level of safety by demonstrating its resistance to pressures and forces from the outside.

## Q10: What is the difference between sample variance and population variance?

A: A) Sample variance is calculated using n, while population variance is calculated using N.

B: B) Sample variance is calculated using  $\bar{x}$ , while population variance is calculated using  $\mu$ .

C: C) Sample variance is calculated using n - 1, while population variance is calculated using N.

D: D) All of the above.



#### Answers

- **Q1:** A A) σ
- Q2: A A) Zero
- Q3: A A) Variance
- Q4: A A) The standard deviation is the variance squared.
- Q5: C C) It does not affect the variance.

Q6: C - C) It increases or decreases the variance by the square of the constant.

**Q7:** A - A) Demonstrating the potential deviation of returns from the expected value to gauge the risk of an investment.

**Q8:** A - A) Determining how much an experiment's results can deviate from the hypothesis to gauge its accuracy.

Q9: A - A) Determining how much a product can stray from the requirements to gauge its quality.

Q10: D - D) All of the above.