

Twitter Thread by Dr. Deepak Sharma (PhD in Mathematics)



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Mathematics is a beautiful subject that has fascinated humans for centuries. In this thread, I will discuss the importance of mathematics in our daily lives and how it can be applied to solve real-world problems. We will explore the concept of probability and its applications in various fields, including science, engineering, and finance. The thread consists of 120 tweets.

Mathematics is a powerful tool that helps us understand the world around us. It is the foundation of many scientific and technological advancements. By studying mathematics, we can develop critical thinking skills and learn how to solve complex problems. This thread aims to provide a comprehensive overview of the subject and its practical applications.

Mathematics is a vast field with many branches. In this thread, we will focus on the basics of probability and its applications. We will start with the definition of probability and then move on to more advanced topics like conditional probability and Bayes' theorem.

1. Introduction to Probability

Probability is a branch of mathematics that deals with the likelihood of an event occurring. It is a fundamental concept in many areas of science and engineering.

There are two main types of probability: theoretical probability and experimental probability.

(Theoretical probability, Experimental probability, Definition 9)

Definition: The probability of an event occurring is the ratio of the number of favorable outcomes to the total number of possible outcomes. It is denoted by $P(A)$, where A is the event. The probability of an event is always between 0 and 1, inclusive. For example, the probability of a coin landing heads up is $\frac{1}{2}$, and the probability of a die showing a 6 is $\frac{1}{6}$.

There are several rules for calculating the probability of an event. The most common ones are the addition rule and the multiplication rule. The addition rule states that the probability of either event A or event B occurring is the sum of their individual probabilities, provided they are mutually exclusive. The multiplication rule states that the probability of both event A and event B occurring is the product of their individual probabilities, provided they are independent.

2. Conditional Probability

Conditional probability is the probability of an event occurring given that another event has already occurred. It is denoted by $P(A|B)$, where A is the event and B is the condition.

There are two main types of conditional probability: joint probability and marginal probability.

(Joint probability, Marginal probability, Definition 10)

Example: 100 people are surveyed about their favorite color. 62,000 people prefer blue, and 20,000 people prefer red. What is the probability of a person preferring blue given that they prefer a color?

$(100 + 4) \times 8 + 62000 / 20000 = 3.1416$

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