

Class 10 Maths

Chapter 14: Probability

1. Introduction and Definition

Probability is the measure of the likelihood that an event will occur. In Class 10, we study the Theoretical Probability (also called Classical Probability) of an event.

Theoretical Probability Formula:

$P(E) = (\text{Number of outcomes favourable to } E) / (\text{Number of all possible outcomes of the experiment})$

2. Important Concepts and Terms

- **Elementary Event:** An event having only one outcome of the experiment is called an elementary event. The sum of the probabilities of all the elementary events of an experiment is 1.
- **Sure (or Certain) Event:** An event that is certain to happen. The probability of a sure event is 1.
- **Impossible Event:** An event that cannot happen. The probability of an impossible event is 0.
- **Range of Probability:** The probability of an event E is a number $P(E)$ such that:
 $0 \leq P(E) \leq 1$

3. Complementary Events

For any event E , the event "not E " is called the complement of E and is denoted by $\bar{E}$ (or E').

$$P(E) + P(\text{not } E) = 1$$

$$\text{Or, } P(E) + P(\bar{E}) = 1$$

4. Standard Cases to Remember

A. Playing Cards

A standard deck of playing cards consists of 52 cards divided into 4 suits of 13 cards each:

1. Spades (Black)
2. Clubs (Black)
3. Hearts (Red)
4. Diamonds (Red)

- Face Cards: Kings, Queens, and Jacks are called face cards. There are 3 face cards in each suit, making a total of 12 face cards in the deck.

B. Coins

- Tossing 1 coin: Possible outcomes = {H, T} (Total = 2)
- Tossing 2 coins: Possible outcomes = {HH, HT, TH, TT} (Total = 4)
- Tossing 3 coins: Possible outcomes = {HHH, HHT, HTH, HTT, THH, THT, TTH, TTT} (Total = 8)

C. Dice

- Throwing 1 die: Possible outcomes = {1, 2, 3, 4, 5, 6} (Total = 6)
- Throwing 2 dice: Total possible outcomes = $6 \times 6 = 36$. (Pairs like (1,1), (1,2), ... (6,6))