

Probability

CBSE Class 10 Maths · Knowledge organiser

KEY DEFINITIONS

Theoretical probability

Favourable outcomes $\div$ total outcomes, when all outcomes are equally likely.

Complementary events

E and 'not E': $P(E) + P(\text{not } E) = 1$.

Sure and impossible events

A sure event has probability 1; an impossible event has probability 0.

KEY FORMULAS

Classical probability

$$P(E) = \frac{\text{favourable outcomes}}{\text{total outcomes}}$$

Complement; range

$$P(E) + P(\bar{E}) = 1; \quad 0 \leq P(E) \leq 1$$

Sure event 1, impossible event 0; probabilities of all elementary events add to 1

Cards: $52 = 4 \text{ suits} \times 13$; 26 red, 26 black; 12 face cards.
Two dice: 36 outcomes

YOU SHOULD BE ABLE TO...

- You know that probabilities lie between 0 and 1, can use $P(\text{not } E) = 1 - P(E)$, and can find simple probabilities.
- List outcomes for coins, dice and cards correctly and solve the standard board questions on each.
- Write complete long answers and case studies, listing favourable outcomes and giving answers in lowest terms.
- Handle two-dice products and sums, modified card packs and 'find the number of balls' problems.

WORKED EXAMPLE

Two dice are thrown. Find the probability that the sum is 9. Favourable: (3,6), (4,5), (5,4), (6,3), so

$$P = \frac{4}{36} = \frac{1}{9}.$$

COMMON MISTAKES

- ✗ Treating "HT" and "TH" as one outcome, or listing (2,3) but not (3,2) for two dice.
- ✗ Forgetting that 1 is neither prime nor composite.
- ✗ Counting 16 face cards (the aces are not face cards).
- ✗ Not reducing the fraction, or giving a probability greater than 1.