

MATHEMATICS • CLASS 10

CHAPTER 14

Probability

NCERT SOLUTIONS



EXERCISE 14.1 – Q1

Q1. Complete the following statements.

(i) Probability of E + probability of 'not E ' = 1.

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

(ii) The probability of an event that cannot happen is 0.
Such an event is called an impossible event.

$$P(E) = 0$$

(iii) The probability of an event that is certain to happen is 1.
Such an event is called a sure event or a certain event.

$$P(E) = 1$$

(iv) The sum of the probabilities of all the elementary events of an experiment is 1.

$$\text{Sum} = 1$$

(v) The probability of an event is greater than or equal to 0 and less than or equal to 1.

$$0 \leq P(E) \leq 1$$

EXERCISE 14.1 — Q2

Which experiments have equally likely outcomes? Explain.

- (i) A driver attempts to start a car.
The car starts or does not start.

Answer: Not necessarily equally likely.
The chances depend on the car's condition.
Two possible outcomes need not have equal chances.

- (iii) A true-false question is answered.
The answer is right or wrong.

Answer: Equally likely if the answer is guessed at random, as assumed here.
One of the two choices is correct, so each outcome has probability $\frac{1}{2}$.

- (ii) A player attempts a basketball shot.
The player scores or misses.

Answer: Not necessarily equally likely.
The chances depend on the player's skill and the situation.

- (iv) A baby is born.
It is a boy or a girl.

Answer: Equally likely in the simplified model used in this exercise.
The model assigns probability $\frac{1}{2}$ to each outcome.

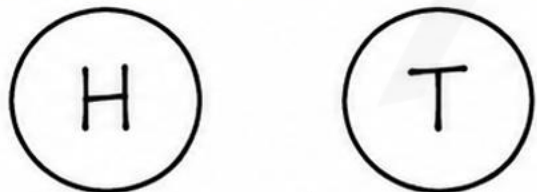
EXERCISE 14.1 — Q3 & Q4

Q3. Why is tossing a coin a fair way to decide which team gets the ball at the beginning of a football game?

Solution:

A fair coin has two equally likely outcomes: head (H) and tail (T).

Assign one outcome to each team.



$$P(H) = \frac{1}{2}$$

$$P(T) = \frac{1}{2}$$

Both teams have the same chance, so the choice is fair.

Q4. Which value cannot be the probability of an event?

- (A) $\frac{2}{3}$ (B) -1.5 (C) 15% (D) 0.7

Solution:

A probability must lie from 0 to 1, including both endpoints.

$$0 \leq P(E) \leq 1$$

$-1.5 < 0$, so it is not allowed.

The other values lie in this range; $15\% = 0.15$.

Answer: (B) -1.5 .

EXERCISE 14.1 – Q5 & Q6

Q5. If $P(E) = 0.05$, find the probability of 'not E'.

Solution:

E and 'not E' are complementary events.
Their probabilities add to 1.

$$\begin{aligned}P(\text{not } E) &= 1 - P(E) \\&= 1 - 0.05 \\&= 0.95\end{aligned}$$

Answer: 0.95.

Q6. A bag contains only lemon-flavoured candies. Malini takes one candy without looking. Find the probability of:

- (i) an orange-flavoured candy;
- (ii) a lemon-flavoured candy.

Solution:

(i) There is no orange candy in the bag.

$$P(\text{orange}) = 0$$

This is an impossible event.

(ii) Every candy in the bag is lemon-flavoured.

$$P(\text{lemon}) = 1$$

This is a sure event.

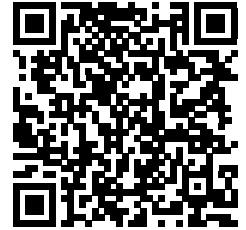


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