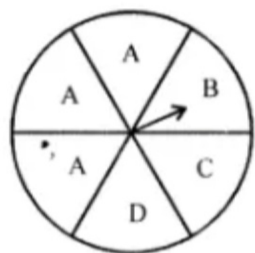


Question 1.

List the outcomes you can see in these experiments.



(i) Spinning a wheel



(ii) Drawing a ball from the bag containing 5 identical ball of different colours.

Solution:

(i) Outcomes in spinning wheel = A, A, A, B, C, D.

(ii) Outcomes in drawing a ball from a bag containing 5 identical balls

of different colours, says Red, black, green, blue, yellow.

Question 2.

A die is rolled once. Find the probability of getting

(i) an even number

(ii) a multiple of 3

(iii) not a multiple of 3

Solution:

Total outcomes of a die when rolled once:

1, 2, 3, 4, 5, 6 = 6

(i) Even numbers : 2, 4, 6

i.e. Favourable outcomes = 3

\therefore Probability $P(E) = \frac{3}{6} = \frac{1}{2}$

(ii) Multiple of 3 = 3, 6

i.e. Favourable outcomes = 2

\therefore Probability $P(E) = \frac{2}{6} = \frac{1}{3}$

(iii) Not a multiple of 3 = 1, 2, 4, 5

i.e., favourable outcomes = 4

$$\therefore \text{Probability } P(E) = \frac{4}{6} = \frac{2}{3}$$

Question 3.

Two coins are tossed together. Find the probability of getting

(i) two tails

(ii) atleast one tail

(iii) no tail

Solution:

When two coins are tossed together, then

$$\text{Total outcomes} = 2 \times 2 = 4$$

i.e. HH, HT, TH, TT

(i) Favourable outcomes of getting two tails = 1

$$\therefore \text{Probability } P(E) = \frac{1}{4}$$

(ii) Favourable outcomes of getting atleast one tail

TH, HT, TT = 3

$$\therefore \text{Probability } P(E) = \frac{3}{4}$$

(iii) Favourable outcomes of getting No tail: HH = 1

$$\therefore \text{Probability } P(E) = \frac{1}{4}$$

Question 4.

Three coins are tossed together. Find the probability of getting

(i) atleast two heads

(ii) atleast one tail

(iii) atmost one tail.

Solution:

Three coins are tossed together.

$$\therefore \text{Total outcomes} = 8$$

= HHH, HHT, HTH, THH, HTT, TTH, TTT, THT

(i) Favourable outcomes of getting

Atleast two heads : These can be HHH, HHT, HTH,

THH = 4 in numbers

$$\therefore P(E) = \frac{\text{Number of favourable outcome}}{\text{Number of all possible outcome}} = \frac{4}{8} = \frac{1}{2}$$

(ii) Favourable outcomes of getting

Atleast one tail: There can be HHT, HTH, HTT, TTT,

THH, THT, TTH = 7 in number

$$\therefore P(E) = \frac{\text{Number of favourable outcome}}{\text{Number of all possible outcome}} = \frac{7}{8}$$

(iii) Favourable outcomes of getting

Atmost one tail: There can be HHH, HHT, HTH, THH =

4

$$\therefore P(E) = \frac{\text{Number of favourable outcome}}{\text{Number of all possible outcome}} = \frac{4}{8} = \frac{1}{2}$$

Question 5.

Two dice are rolled simultaneously. Find the probability of getting

(i) the sum as 7

(ii) the sum as 3 or 4

(iii) prime numbers on both the dice.

Solution:

Two dice are rolled simultaneously

Total outcomes = $6 \times 6 = 36$

(i) Sum as 7 : (1, 6), (2, 5), (3, 4), (4, 3), (5, 2), (6, 1) = 6

$$\therefore \text{Probability } P(E) = \frac{\text{Favourable outcomes}}{\text{Total outcomes}} = \frac{6}{36} = \frac{1}{6}$$

(ii) The sum as 3 or 4

(1, 2), (1, 3), (2, 1), (2, 2), (3, 1) = 5

$$\therefore \text{Probability } P(E) = \frac{\text{Favourable outcomes}}{\text{Total outcomes}} = \frac{5}{36}$$

(iii) Prime numbers on both the dice

(2, 2), (2, 3), (2, 5), (3, 2), (3, 3), (3, 5), (5, 2), (5, 3), (5, 5)

= 9

$$\therefore \text{Probability } P(E) = \frac{\text{Favourable outcomes}}{\text{Total outcomes}} = \frac{9}{36} = \frac{1}{4}$$

Question 6.

A box contains 600 screws, one tenth are rusted.

One screw is taken out at random from the box. Find the probability that it is

(i) a rusted screw

(ii) not a rusted screw

Solution:

Rusted screw = $\frac{1}{10}$ of 600 = $\frac{1}{10} \times 600 = 60$ screws

(i) Favourable outcomes of picking rusted screw = 60

$$P(E) = \frac{60}{600} = \frac{1}{10}$$

(ii) P (of not a rusted screw) = $1 - P(\text{rusted screw}) =$

$$1 - \frac{1}{10} = \frac{9}{10}$$

Question 7.

A letter is chosen from the word 'TRIANGLE'. What is the probability that it is a vowel?

Solution:

'TRIANGLE'

Total number of outcomes = 8

Vowels : I, A, E = 3

$$\therefore \text{Probability } P(E) = \frac{3}{8}$$

Question 8.

A bag contains 5 red, 6 black and 4 white balls. A ball is drawn at random from the bag, find the probability the ball is drawn is

(i) white

(ii) not black

(iii) red or black

(iv) neither red nor black

Solution:

In a bag, there are 5 red, 6 black and 4 white balls.

Total number of outcomes = $5 + 6 + 4 = 15$

(i) Probability of white ball = $\frac{4}{15}$

(ii) Probability of not black ($5 + 4 = 9$) balls = $\frac{9}{15} = \frac{3}{5}$

(iii) Probability of red or black ball ($5 + 6 = 11$) = $\frac{11}{15}$

(iv) Probability of ball which is neither red nor black, white ball (4) $P(E) = \frac{4}{15}$

Question 9.

A box contains 17 cards numbered 1, 2, 3,, 17 and are mixed thoroughly. A card is drawn at random from the box. Find the probability that the number on the card is

(i) odd

(ii) even

(iii) prime

(iv) divisible by 3

(v) divisible by 2 and 3 both

Solution:

A box contains 17 cards numbered 1 to 17

Total number of outcomes = 17

(i) Card bearing odd number (1, 3, 5, 7, 9, 11, 13, 15, 17) = 9

∴ Probability $P(E) = \frac{9}{17}$

(ii) Even number (2, 4, 6, 8, 10, 12, 14, 16) = 8

∴ Probability $P(E) = \frac{8}{17}$

(iii) Prime numbers {2, 3, 5, 7, 11, 13, 17} = 7

∴ Probability $P(E) = \frac{7}{17}$

(iv) Numbers divisible by 3 = 3, 6, 9, 12, 15 = 5

∴ Probability $P(E) = \frac{5}{17}$

(v) Number divisible by 2 and 3 both 6, $12 = 2$

$$\therefore \text{Probability } P(E) = \frac{2}{17}$$

Question 10.

A card is drawn from a well-shuffled pack of 52 cards. Find the probability that the card drawn is:

- (i) an ace
- (ii) a red card
- (iii) neither a king nor a queen
- (iv) a red face card or an ace
- (v) a card of spade
- (vi) non-face card of red colour.

Solution:

Number of playing cards in a deck = 52

One card is drawn

(i) An ace : 4

$$\therefore \text{Probability } P(E) = \frac{4}{52} = \frac{1}{13}$$

(ii) A red card = $13 + 13 = 26$

$$\therefore \text{Probability } P(E) = \frac{26}{52} = \frac{1}{2}$$

(iii) Neither a king nor a queen

Number of cards $52 - (4 + 4) = 52 - 8 = 44$

$$\therefore \text{Probability } P(E) = \frac{44}{52} = \frac{11}{13}$$

(iv) A red face card = 6

$$\therefore \text{Probability } P(E) = \frac{6}{52} = \frac{3}{26}$$

(v) A card of spade or an ace = $13 + 3 = 16$

$$\therefore \text{Probability } P(E) = \frac{16}{52} = \frac{4}{13}$$

(vi) Non-face card of red colour = $26 - 6 = 20$

$$\therefore \text{Probability } P(E) = \frac{20}{52} = \frac{5}{13}$$

Question 11.

In a lottery, there are 5 prized tickets and 995 blank tickets. A person buys a lottery ticket. Find the probability of his winning a prize.

Solution:

Number of prized tickets = 5

Number of blank tickets = 995

Total number of tickets = $5 + 995 = 1000$

Probability of prized ticket

$$P(E) = \frac{\text{Number of favourable outcome}}{\text{Number of possible outcome}}$$
$$= \frac{5}{1000} = \frac{1}{200}$$