CBSE Board Class 10 Maths Chapter 15- Probability
Objective Questions

Introduction to Probability

1. What is the probability that the minute and hour hands of a clock will form an acute angle at any given time?

(A) P > 0.5
(B) P = 0.5
(C) P < 0.5
(D) P ≤ 0.25

Answer: (C) $P < 0.5$

Solution: The amount of time in a period of 12 hours when the hands will form an acute angle will be the same as that for obtuse angle. So, you would think that the probability is 12. But if you take into account the small amounts of time when the hands are aligned (0°), hands are at right angles and hands are facing in opposite directions (180°), then the probability would be slightly less than 0.5.

Complementary Events

2. Two dice are thrown at the same time. Find the probability of getting different values on both.

(A) 5/6
(B) ½
(C) 1/6
(D) 1/36

Answer: (A) 5/6

Solution: Let E be the event of getting different values on both the dice. The complementary event is getting the same value on both, for which there are 6 favorable outcomes: (1,1), (2,2), (3,3), (4,4), (5,5) and (6,6). Thus, P (not E) = 1/6
Thus, P (E) = 1 - P (not E) = 1 – (1/6) = 5/6

3. If P (A) and P (not A) are complementary events and P (A) = 0.15, then P (not A) =?

(A) 0.35
(B) Cannot be determined
(C) 0.85
(D) 0.3

Answer: (C) 0.85

Solution: Given, P (A) = 0.15
As, P (A) and P (not A) are complementary events, P (A) + P (not A) = 1
P (not A) = 1 – P (A) = 1 – 0.15 = 0.85

4. What is the probability of not picking a king if you choose randomly from a pack of 52 cards?

(A) 1/13
(B) 12/13
(C) 51/52
(D) 1/52

Answer: (B) 12/13

Solution: Since there are 4 kings in a deck of 52, the probability of drawing a king is 4/52 = 1/13.
Hence, the probability of not picking a king is 1 – 1/13 = 12/13.
(∵ For an event E, P (E) =1-P (not E)).

5. What is the probability of not picking a face card when you draw a card at random from a pack of 52 cards?

(A) 1/13
(B) 4/13
(C) 10/13
(D) 12/13

Answer: (C) 10/13

Solution: Since there are 12 face cards in a deck of 52cards, the probability of drawing a face card is 12/52= 3/13
Hence, the probability of not picking a face card = 1 – 3/13= 10/13

Experimental Probability

6. 24 cards numbered 1, 2, 3, ..., 23, 24 are put in a box and mixed thoroughly. One person draws a card from the box. The probability that the number on the card is divisible by 2 or 3 or both is

(A) 5/6
(B) 2/3

(C) 1/3
(D) 1/6

Answer: (B) 2/3

Solution: The total possible outcomes = 24

Numbers divisible by only 2 are 2, 4, 8, 10, 14, 16, 20, 22 (8 numbers) --------- (1)

Numbers divisible only by 3 are 3, 9, 15, 21 (4 numbers) --------- (2)

Numbers divisible by both 2 and 3 are 6, 12, 18, 24 (4 numbers) --------- (3)

From (1), (2) and (3), we see that the number of favourable outcomes is 16 (i.e., 8 + 4 + 4).
We know that, Probability of an event E, P (E) =number of favourable outcomes/ total number of outcomes
=16/24
=2/3

7. A bag contains 6 black, 7 red and 2 white balls. A ball is drawn from the bag at random. Find the probability that the ball drawn is black or white.

(A) 8/15
(B) 3/5
(C) 2/3
(D) 1/5

Answer: (A) 8/15

Solution: Total number of balls = 15
Number of balls that are either black or white = 8
Hence the number of favourable outcomes of ball drawn being black or white is 8.
We know that, Probability of an event E, P (E) =number of favourable outcomes/total number of outcomes
So, the required probability is 8/15.

8. A card is drawn from a well-shuffled deck of playing cards. Find the probability of drawing a black card which is neither a face card nor an ace?

(A) 10/13
(B) 9/13
(C) 9/26
(D) 9/52

Answer: (C) 9/26

Solution: In each suit, there are 9 cards that are not face cards and ace.
Hence, there will be a total of 18 cards in a deck which are black and are not face cards and ace.
We know that, Probability of an event E, P (E) =number of favourable outcomes/total number of outcomes
Required probability is 18/52 = 9/26.

9. Each of letters of the word PILOTS is on separate cards, face down on the table. If you pick a card at random, what is the probability that the letter will be a T or an L?

(A) 1/6
(B) 1/3
(C) ½
(D) 2/3

Answer: (B) 1/3

Solution: There are 6 outcomes out of which 2 are favourable (which are, getting T or L).
Probability of an event E, P (E) =number of favourable outcomes/ total number of outcomes
Required probability = 2/6 = 1/3.

Theoretical Probability

10. A single die is rolled. The probability of getting 1 or an even number is

(A) 1/6
(B) 4/6
(C) 5/6
(D) 3/6

Answer: (D) 3/6

Solution: The favorable outcomes are 1, 2, 4 and 6.
We have 4 favorable outcomes out of a total outcomes of 6.

Thus the required probability = 4/6 = 2/3.

11. A bucket contains 10 brown balls, 8 green balls, and 12 red balls and you pick one randomly without looking. What is the probability that the ball will be brown?

(A) 0.33
(B) 0.61
(C) 1/3
(D) 4/15

Answer: (C) 1/3

Solution: There are a total of 10 + 8 + 12 = 30 balls, out of which 10 are brown.
The required probability is 10/30 = 1/3.

12. A number is chosen at random among the first 100 natural numbers. Find the probability that the number chosen is prime.

(A) ¼
(B) 3/10
(C) 29/100
(D) 27/100

Answer: (A) ¼

Solution: There are 25 prime numbers in the set of the first 100 natural numbers. They are:
2,3,5,7,11,13,17,19,23,29,31,37,41,43,47,53,59,61,67,71,73,79,83,89**, and** 97**.**
We know that, Probability of an event E, P (E) =number of favourable outcomes/ total number of outcomes.

Hence, the required probability = 25/100 = 1/4.

13. From a well-shuffled pack of 52 cards, a card is drawn at random, find the probability that it is a spade.

(A) ½
(B) ¼
(C) 1/51
(D) 1/52

Answer: (B) ¼

Solution: There are 13 spades in a deck of 52. Hence, the probability of drawing a spade is 13/52 = ¼

14. A die is thrown once, the probability of getting a composite number on the die is

(A) 1/3
(B) ½
(C) 2/3
(D) 1/6

Answer: (A) 1/3

Solution: The composite numbers among the numbers on a die are 4 and 6. Thus, we have 2 favourable outcomes out of a total of 6 outcomes. Hence, the required probability is 2/6 = 1/3.

15. The probability of an event of a trial

(A) is greater than 1
(B) 0
(C) lies between 0 and 1 (both inclusive)
(D) 1

Answer: (C) lies between 0 and 1 (both inclusive)
Solution: The probability of any event will lie between 0 and 1, both included

16. What is the probability of getting all heads or all tails, when three coins are tossed simultaneously?

(A) ¾
(B) ½
(C) ¼
(D) 1/8

Answer: (C) 1/4

Solution: When three coins are tossed simultaneously, there are 8 possible outcomes, which are (HHH), (HHT), (HTH), (THH), (HTT), (THT), (TTH), (TTT), where H is represents the head and T represents the tail.
Favorable outcomes of getting all heads or all tails are HHH and TTT.
We know that, Probability of an event E, P (E) =Number of favorable outcomes /Total number of outcomes
Hence, the required probability = 2/8 = 1/4

17. There are 5 green, 6 black and 7 white balls in a bag. A ball is drawn at random from the bag. Find the probability that it is not white.

(A) 5/18
(B) 2/3
(C) 7/18
(D) 11/18

Answer: (D) 11/18

Solution: Given,

Number of green balls = 5

Number of black balls = 6

Number of white balls = 7

Total number of outcomes = 5 + 6 + 7 = 18

There are 18 balls out of which 11 are not white.

⇒ Number of favourable outcomes = 11

Probability of an event, P (E) = =Number of favourable outcomes / Total number of outcomes

⇒ P (ball drawn is not white) = 11/18

Therefore, probability that the ball drawn is not white is 11/18.

Alternate Method:
P (ball drawn is white) = 7/18

We know that,

P (ball drawn is white) + P (ball drawn is not white) = 1

Because the sum of the probability of an event and its complementary event is always 1.

⇒ P (ball drawn is not white) = 1 - P (ball drawn is white) = 1−7/18 = 11/18

Therefore, probability that the ball drawn is not white is 11/18.

18. From a set of 17 cards, numbered 1, 2,... 17, one card is drawn. What is the probability that the number is a multiple of 3 or 7?

(A) 5/17
(B) 7/17
(C) 8/17
(D) 6/17

Answer: (B) 7/17

Solution: The total number of possible outcomes is 17

The number of favourable outcomes is 3, 6, 7, 9, 12, 14 and 15

= 7

Thus, the required probability = number of favourable outcomes/ total number of outcomes

= 7/17.