CBSE NCERT Solutions for Class 10 mathematics Chapter 15

Exercise 15.1

Q.1. Probability of an event E + Probability of the event 'not E' =_____
1

Solution: The complement rule states that the sum of the probabilities of an event and its complement must equal to 1.

Therefore, P(E)+P(E)=1.

Hence, the required answer is 1. For example, in an experiment of throwing a die and noting the result, the event A="getting a number less than 2"⇒P(A)=16 B="getting a number greater than equal to 2"⇒P(B)=56 Therefore, P(A)+P(B)=1.

Q.2. The probability of an event that cannot happen is _____. Such an event is called _____ event.
0

Solution: We know that, the probability of an event lies between zero and one.

The probability of an event that cannot happen is zero.

An impossible event occurs when the event does not contain any element of the sample space. For example, in our experiment of throwing a die and noting the result, the event A="getting a number greater than 6"

impossible

Solution: We know that the probability of an event lies between zero and one.

The probability of an event that cannot happen is zero.

An impossible event occurs when the event does not contain any element of the sample space. For example, in our experiment of throwing a die and noting the result, the event A="getting a number greater than 6"

Q.3. The probability of an event that is certain to happen is _____. Such an event is called _____ event [Complementary / Sure / Impossible].
1

Solution: We know that, the probability of an event lies between zero and one.

The probability of an event that is certain to happen is 1.

Such an event is called a sure event. A sure event is the one that contains the whole sample space. For example, in our experiment of throwing a die and noting the result Let A is an event of getting a number less than 7 Possible outcomes =Favourable outcomes ={1,2,3,4,5,6} Probability of getting a number less than 7=PA=66=1

sure

Solution: We know that, the probability of an event lies between zero and one.

The probability of an event that is certain to happen is 1.

Such an event is called a sure event. A sure event is the one that contains the whole sample space. For example, in our experiment of throwing a die and noting the result Let A is an event of getting a number less than 7 Possible outcomes =Favourable outcomes ={1,2,3,4,5,6} Probability of getting a number less than 7=PA=66=1

Q.4. The sum of the probabilities of all the elementary events of an experiment is _____.
1

Solution: The basic theory of probability states that the sum of the probabilities of a certain or sure event shall be 1 , as all the events should have nearly the same chances of occurring.

Thus, the sum of their respective probabilities should be 1 as it is a sure event.

For example, while tossing a coin, there are two events {H,T}. P(H)=12 and P(T)=12 Therefore, sum of probabilities of both the events is 1.

Q.5. The probability of an event is greater than or equal to 0 and less than or equal to _____ .
1

Solution: If an event is impossible its probability is zero. Similarly, if an event is certain to occur, its probability is one. The probability of any event lies in between these values. It is called the range of probability and is denoted as $0 \le P(E) \le 1$.

Sum of probability of lower possible value and upper possible value is 1.

Q.6. A piggy bank contains hundred 50 p coins, fifty ₹1 coins, twenty ₹2 coins and ten ₹5 coins. If it is equally likely that one of the coins will fall out when the bank is turned upside down, what is the probability that the coin will be a 50 p coin?

Solution: Total number of coins in a piggy bank =100+50+20+10=180

Number of 50 p coins =100
Probability that the fallen coin will be a 50 p coin
=Number of favourable outcomesTotal number of outcomes=100180=59

Q.7. A piggy bank contains hundred 50 p coins, fifty ₹1 coins, twenty ₹2 coins and ten ₹5 coins. If it is equally likely that one of the coins will fall out when the bank is turned upside down, what is the probability that the coin will not be a ₹5 coin?

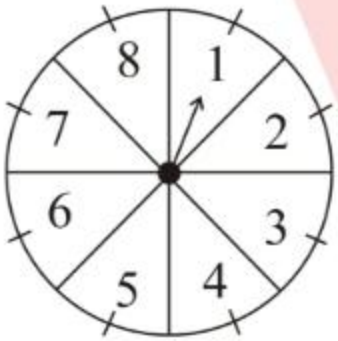
Solution: Total number of coins in a piggy bank =100+50+20+10=180
Number of ₹5 coins =10
Probability that the fallen coin will be a ₹5 coin
=Number of favourable outcomesTotal number of outcomes=10180=118
Probability that the fallen coin will not be a ₹5 coin =1-118=1718

Q.8. Gopi buys a fish from a shop for his aquarium. The shopkeeper takes out one fish at random from a tank containing 5 male fish and 8 female fish (see Fig.). What is the probability that the fish taken out is a male fish?

Solution: Total number of fishes in the tank =5+8=13
Number of male fishes in the tank =5

Probability that a male fish is taken out
=Numberof favourable outcomesTotal number of outcomes=Number of male fishes in the tankTotal number of fishes in the tank=513

Q.9. A game of chance consists of spinning an arrow which comes to rest pointing at one of the numbers 1,2,3,4,5,6,7,8 (see Fig.), and these are equally likely outcomes. What is the probability that it will point at 8?

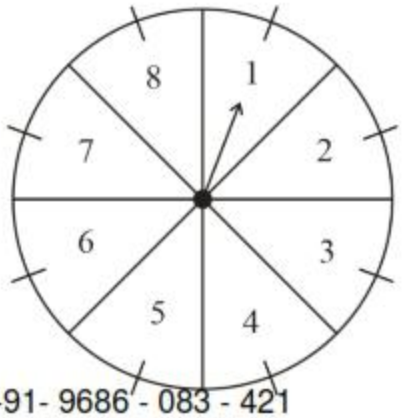


Solution: Total number of possible outcomes =8

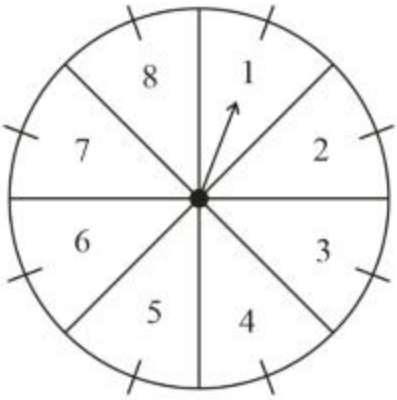
Number of favourable outcome =1

Probability of pointing at 8=Number of favourable outcomesTotal number of outcomes=18 Probability that it will point at 8 is 18.

Q.10. A game of chance consists of spinning an arrow which comes to rest pointing at one of the numbers 1,2,3,4,5,6,7,8, and these are equally likely outcomes. What is the probability that it will point at an odd number?



Solution:



Total number of possible outcomes =8
Total odd numbers {1,3,5,7}=4
Probability of pointing at an odd number =Number of favourable outcomesTotal number of outcomes=48=12

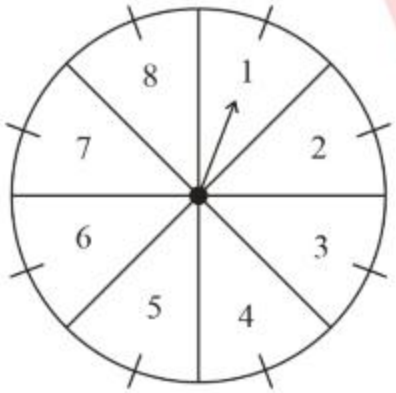
Q.11. A game of chance consists of spinning an arrow which comes to rest pointing at one of the numbers 1, 2, 3, 4, 5, 6, 7, 8, and these are equally likely outcomes. What is the probability that it will point at a number greater than 2?

Solution: Total number of possible outcomes =8

Set of numbers greater than 2={3, 4, 5, 6, 7, 8}

Total numbers greater than 2=6 Probability of pointing at a number greater than 2
=NumberoffavourableoutcomesTotalnumberofoutcomes=68=34

Q.12. A game of chance consists of spinning an arrow which comes to rest pointing at one of the numbers 1,2,3,4,5,6,7,8, and these are equally likely outcomes. What is the probability that it will point at a number less than 9?



Solution: Total number of possible outcomes =8

Set of numbers less than 9={1,2,3,4,5,6,7,8}
Total numbers less than 9=8
Probability of pointing at a number less than 9=Number of favourable eventsTotal number of events=88=1

Q.13. A die is thrown once. Find the probability of getting a prime number.

Solution: It is given to through a die.

Possible outcomes in throwing a die are 1,2,3,4,5,6.
Hence, total number of possible outcomes =6
Number of Prime numbers =3 (2,3 and 5)
Probability of getting a prime number
=Number of favourable eventsTotal number of events=Number of prime numberTotal number of possible outcomes=36=12

Q.14. A die is thrown once. Find the probability of getting a number lying between 2 and 6.

Solution: Possible outcomes in throwing a die are 1,2,3,4,5,6.
Hence, total number of possible outcomes =6
Numbers lying between 2 and 6 are 3, 4 and 5. Therefore, total number is 3.
Probability of getting a number lying between 2 and 6
=Number of numbers lying between 2 and 6Total number of possible outcomes=36=12.

Q.15. A die is thrown once. Find the probability of getting an odd number.

Solution: Possible outcomes in throwing a die are 1,2,3,4,5,6.

Hence, total number of possible outcomes =6

Number of Odd numbers =3 (1,3 and 5) Probability of getting an odd number
=Number of favourable eventsTotal number of events=36=12

Q.16. One card is drawn from a well-shuffled deck of 52 cards. Find the probability of getting a king of red colour

Solution: Total number of cards =52

Total number of kings of red colour =2
Probability of getting a king of red colour =Number of favourable outcomesTotal number of outcomes
=252=126

Q.17. One card is drawn from a well-shuffled deck of 52 cards. Find the probability of getting a face card.

Solution: Total number of cards =52
Total number of face cards =12
Probability of getting a face card =Number of favourable outcomesTotal number of outcomes=1252=313

Q.18. One card is drawn from a well-shuffled deck of 52 cards. Find the probability of getting a red face card.

Solution: Total number of cards =52

Total number of red face cards =6

Probability of getting a red face card =Number of favourable outcomesTotal number of outcomes=652=326

Q.19. One card is drawn from a well-shuffled deck of 52 cards. Find the probability of getting the jack of hearts

Solution: Total number of cards =52

Total number of jack of hearts =1

Probability of getting a jack of hearts=Number of favourable outcomesTotal number of outcomes=152

Q.20. One card is drawn from a well-shuffled deck of 52 cards. Find the probability of getting a spade.

Solution: Total number of cards =52
Total number of spade cards =13

Probability of getting a spade card =Number of favourable outcomesTotal number of outcomes=1352=14

Q.21. One card is drawn from a well-shuffled deck of 52 cards. Find the probability of getting the queen of diamonds.

Solution: Total number of cards =52
Total number of queen of diamonds =1
Probability of getting a queen of diamonds =Number of favourable outcomesTotal number of outcomes=152

Q.22. Five cards - the ten, jack, queen, king and ace of diamonds, are well-shuffled with their face downwards. One card is then picked up at random. What is the probability that the card is the queen?

Solution: Total number of cards =5
Total number of queen =1
Probability of picking up a queen =Number of favourable outcomestotal number of outcomes=15

Q.23. Five cards - the ten, jack, queen, king and ace of diamonds, are well-shuffled with their face downwards. One card is then picked up at random. If the queen is drawn and put aside, what is the probability that the second card picked up is an ace?

Solution: Given that there are five cards and the queen is drawn.

When the queen is drawn and put aside, the total number of remaining cards =4

Total number of aces =1 Probability of picking up an ace =Number of cards that are aceTotal number of remaining cards=14

Q.24. Five cards - the ten, jack, queen, king and ace of diamonds, are well-shuffled with their face downwards. One card is then picked up at random. If the queen is drawn and put aside, what is the probability that the second card picked up is a queen?

Solution: When the queen is drawn and put aside, the total number of remaining cards =4

As queen is already drawn out, total number of queens left =0

Probability of picking up a queen =Number of favourable outcomestotal number of outcomes=04=0

Q.25. 12 defective pens are accidentally mixed with 132 good ones. It is not possible to just look at a pen and tell whether or not it is defective. One pen is taken out at random from this lot. Determine the probability that the pen taken out is a good one.

Solution: Total number of defective pens 12
Total number of good pens =132
Total number of pens=12+132=144
Probability that a good pen is taken out =Number of favourable outcomestotal number of outcomes=132144=1112

Q.26. A lot of 20 bulbs contain 4 defective ones. One bulb is drawn at random from the lot. What is the probability that this bulb is defective?

Suppose the bulb drawn earlier is not defective and is not replaced. Now one bulb is drawn at random from the rest. What is the probability that this bulb is not defective?

Solution: Total number of bulbs =20
Total number of defective bulbs =4
Probability of drawing a defective bulb =Number of defective bulbsTotal number of bulbs=420=15

If the bulb drawn earlier is not defective and not replaced, then the remaining bulb in the lot are 19 in which 15 are not defective.

Therefore, Probability of drawing a non-defective bulb from the rest=Number of non defective bulbsTotal number of bulbs=1519

Q.27. A box contains 90 discs which are numbered from 1 to 90. If one disc is drawn at random from the box, find the probability that it bears a two-digit number .

Solution: Total number of discs =90
Total number of two-digit numbers between 1 and 90=81
Probability of drawing a two-digit number =No. of favorable outcomesTotal no. of outcomes=8190=910

Q.28. A box contains 90 discs which are numbered from 1 to 90. If one disc is drawn at random from the box, find the probability that it bears a perfect square number.

Solution: Total number of discs =90

Perfect squares from 1 to 90 are 1,4,9,16,25,36,49,64, and 81

∴ Total number of perfect squares from 1to 90 =9
Probability of drawing a perfect square =Number of favorable outcomesTotal number of outcomes=990=110

Q.29. A box contains 90 discs which are numbered from 1 to 90. If one disc is drawn at random from the box, find the probability that it bears a number divisible by 5.

Solution: Total number of discs =90

Numbers from 1 to 90 that are divisible by 5 are
5,10,15,20,25,30,35,40,45,50,55,60,65,70,75,80,85,and 90.

∴ Total numbers divisible by 5=18 Probability of drawing a number divisible by
5=No. of favorable outcomesTotal no. of outcomes=1890=15

Q.30. A child has a die whose six faces show the letters as given below
ABCDEA
The die is thrown once. What is the probability of getting A?

Solution: Total number of possible outcomes on die =6

Total number of faces with letter A on it =2

Hence, P(getting A)=Number of favorable outcomesTotal number of outcomes=26=13

Q.31. A child has a die whose six faces show the letters as given below:
ABCDEA

The die is thrown once. What is the probability of getting D?

Solution: Total number of possible outcomes on die =6

Total number of faces with letter D on it =1

Hence, P (getting D) =No. of favorable outcomesTotal no. of outcomes=16

Q.32. Which of the following experiments have equally likely outcomes? Explain.

A driver attempts to start a car. The car starts or does not start.

Solution: The outcomes in a sample space S are equally likely if each outcome has the same probability of occurring.

Therefore, it's not equally likely event as the car may have a mechanical breakdown or fuel problems etc. It depends upon various other things.

Hence, the given experiment do not have equally likely outcome.

Q.33. Does the experiment 'A player attempts to shoot a basketball. She/he shoots or misses the shot.' have equally likely outcomes? Explain.

Solution: The outcomes of a Sample space are called equally likely if all of them have the same chance of occurring. In the given situation,

It is not equally likely event, as it depends on player to player along with their ability.

Q.34. The following experiment equally likely outcomes or not? Explain.
Q). A trial is made to answer a true-false question. The answer is right or wrong.

Solution: The outcomes of a sample space are called equally likely if all of them have the same chance of occurring. In the given situation,

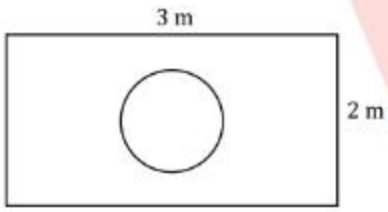
It is an equally likely event. We have only two possible outcome and chances for both to happen is equal.

Q.35. Does the experiment 'A baby is born. It is a boy or a girl.' have equally likely outcomes? Explain.

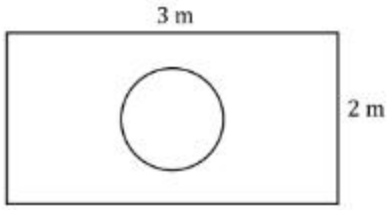
Solution: The outcomes of a sample space are called equally likely if all of them have the same chance of occurring. In the given situation,

It is an equally likely event. We have only two possible outcome and chance for both to happen is equal.

Q.36. Suppose you drop a die at random on the rectangular region shown in the figure. What is the probability that it will land inside the circle with diameter 1 m? Assume $\pi=227$.



Solution: Given figure is:



Area of the rectangle =3 m×2 m=6 m2 Now, diameter of the circle =1 m ∴ Radius of the circle r=12 m Then, area of the circle =πr2=π122=π4 m2 P (die will land inside the circle) =Favourable areaTotal area =π46=π24=227×24=1184 Hence, the probability that a die dropped at random on the rectangular region will land inside the circle is 1184.

Q.37. A lot consists of 144 ball pens of which 20 are defective and the others are good. Nuri will buy a pen if it is good, but will not buy if it is defective. The shopkeeper draws one pen at random and gives it to her. What is the probability that she will buy it?

Solution: The total number of pens =144

Total number of defective pens =20

Total number of good pens =144-20=124 P (Nuri buys a pen) =Probability of drawing a good pen
=Total number of good pensThe total number of pens=124144=3136

Q.38. A lot consists of 144 ball pens of which 20 are defective and the others are good. Nuri will buy a pen if it is good, but will not buy if it is defective. The shopkeeper draws one pen at random and gives it to her. What is the probability that she will not buy it?

Solution: The total number of pens =144

Total number of defective pens =20

Total number of good pens =144-20=124 P (Nuri will not buy a pen) =Probability of drawing a defective pen
=Total number of defective pensThe total number of pens=20144=536

Q.39. Two dice, one blue and one grey, are thrown at the same time. Complete the following table:

Event 'Sum on two dice'	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Probability	136						536				136

Solution: To get sum as 2, possible outcome is (1,1).
To get sum as 3, possible outcomes are (2,1) and (1,2).
To get sum as 4, possible outcomes are (3,1), 1,3,(2,2).
To get sum as 5, possible outcomes are 4,1,1,42,3,(3,2).
To get sum as 6, possible outcomes are 5,1,1,52,4,4,2,3,3.
To get sum as 7, possible outcomes are 6,1,1,62,5,5,2,3,4(4,3).
To get sum as 8, possible outcomes are 6,2,(2,6),3,5,5,3,4,4.
To get sum as 9, possible outcomes are (3,6),(6,3)(6,3),(4,5),(5,4).
To get sum as 10, possible outcomes are 4,6,6,4,(5,5).
To get sum as 11, possible outcomes are 5,6,6,5.
To get sum as 12, possible outcomes are (6,6).
Total number of outcomes =36

Event 'Sum of two dice'	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Probability	136	236	336	436	536	636	536	436	336	236	136

Q.40. Two dice, one blue and one grey, are thrown at the same time.
A student argues that there are 11 possible outcomes 2,3,4,5,6,7,8,9,10,11 and 12. Therefore, each of them has a probability 111. Do you agree with this argument? Justify your answer.

Solution: The Student is arguing that there are 11 possible outomes and each outcome has 111 probability of occuring, which is the case of equally likely events.

Let's look at the possible outcomes.

To get sum as 2, possible outcome is (1,1). To get sum as 3, possible outcomes are (2,1) and (1,2). To get sum as 4, possible outcomes are (3,1), 1,3,(2,2). To get sum as 5, possible outcomes are 4,1,1,42,3,(3,2). To get sum as 6, possible outcomes are 5,1,1,52,4,4,2,3,3. To get sum as 7, possible outcomes are 6,1,1,62,5,5,2,3,4(4,3). To get sum as 8, possible outcomes are 6,2,(2,6),3,5,5,3,4,4. To get sum as 9, possible outcomes are (3,6),(6,3)(6,3),(4,5),(5,4). To get sum as 10, possible outcomes are 4,6,6,4,(5,5). To get sum as 11, possible outcomes are 5,6,6,5. To get sum as 12, possible outcomes is (6,6). Total number of outcomes =36.
Clearly the events are not equally likely, and therefore they will not have probability111.

Q.41. A game consists of tossing a one-rupee coin 3 times and noting its outcome each time. Hanif wins if all the tosses give the same result i.e., three heads or three tails, and loses otherwise. Calculate the probability that Hanif will lose the game.

Solution: There are 8 possible outcomes, which are {HHH,TTT,HHT,HTH,THH,TTH,THT,HTT}.

Number of favourable outcomes =2 which are (TTT and HHH).

P(Hanif will win the game) =28=14. ∴P(Hanif will lose the game) =1-14=34.

Q.42. A die is thrown twice. What is the probability that 5 will not come up either time?

Solution: Total number of outcomes =6×6=36

Number of outcomes when 5 comes up either time are 5,1,5,2,5,3,5,4,5,5,5,6,1,5,(2,5),3,5,4,5,6,5.

Number of favourable cases =11 P(5 will come up either time) =1136 P(5 will not come up either time) =1-1136=2536.

Q.43. A die is thrown twice. What is the probability that 5 will come up at least once ?

Solution: When two dice are thrown,

Total number of outcomes =6×6=36

Number of outcomes when 5 comes up either time are 5,1,5,2,5,3,5,4,5,5,5,6,1,5,(2,5),3,5,4,5,6,5. Number of favourable cases =11 Number of cases when 5 will come at least once =11 P (5 will come at least once) =1136

Q.44. Which of the following arguments are correct and which are not correct? Give reasons for your answer. If two coins are tossed simultaneously there are three possible outcomes - two heads, two tails or one of each. Therefore, for each of these outcomes, the probability is 13.

Solution: The given statement is incorrect since, all three outcomes are not equally likely.

When two coins are tossed simultaneously, then possible outcomes are H,H,H,T,T,H,and (T,T).

So, the probability of getting two heads is 14, probability of getting two tails is 14 and probability of getting one of each is 24=12.

Q.45. Check whether the following argument is correct or not correct. Give reasons for your answer.

If a die is thrown, there are two possible outcomes - an odd number or an even number. Therefore, the probability of getting an odd number is 12.

Solution: The given statement is correct since, an odd number and an even number are equally likely.

When a die is thrown possible outcomes are 1,2,3,4,5,and 6. Out of which 1,3,5 are odd and 2,4,6 are even numbers.

In other words, it can be said that when a die is thrown, there are two possible outcomes - an odd number or an even number as these outcomes are equally likely. So, the probability of getting an odd number =36=12.

Q.46. Why is tossing a coin considered to be a fair way of deciding which team should get the ball at the beginning of a football game?

Solution: When a coin is tossed, it has only two possible outcomes and they are equally likely.

The possible outcomes are Head, Tail

Number of possible outcomes =2 So, probability of getting head =12= probability of getting tail Hence, tossing of a coin is considered as a fair way to decide which team should get the ball at the beginning of a football game.

Q.47. Which of the following cannot be the probability of an event?
23-1.5

Solution: The probability of an event is always greater than or equal to 0 and less than or equal to one. Hence, from given alternatives -1.5 cannot be the probability of an event.

15%0.7

Q.48. If PE=0.05, what is the probability of 'not E'?

Solution: The Complement Rule states that the sum of the probabilities of an event and its complement must equal 1.

Therefore,

PE-=1-PE=1-0.05=0.95 Hence, the probability of 'not E' is 0.95.

Q.49. A bag contains lemon flavoured candies only. Malini takes out one candy without looking into the bag. What is the probability that she takes out? An orange flavoured candy?

Solution: The bag contains lemon flavoured candies only. Hence, event that Malini takes out an orange flavoured candy, is an impossible event. ∴ P (an orange flavoured candy) =0

Q.50. A bag contains lemon flavoured candies only. Malini takes out one candy without looking into the bag. What is the probability that she takes out? A lemon flavoured candy ?

Solution: The bag contains lemon flavoured candies only.

So, the event that Malini takes out a lemon flavoured candy, is a sure event.

∴ P (a lemon flavoured candy) =1

Q.51. It is given that in a group of 3 students, the probability of 2 students not having the same birthday is 0.992. What is the probability that the 2 students have the same birthday?

Solution: Two students will either have same birthday, or they will not have the same birthday. Hence these two events are complementary events to each other. So,
Probability that two students are not having same birthday =PE=0.992

∴ Probaility that two students are having same birthday PE'=1-PE=1-0.992=0.008

Q.52. A bag contains 3 red balls and 5 black balls. A ball is drawn at random from the bag. What is the probability that the ball drawn is i red?

Solution: Total number of balls in the bag =3+5=8
Number of red balls =3
We have to find the probaility of drawing a red ball
P(red ball)=Number of favourable outcomesThe total number of outcomes=Number of red ballTotal number of balls=38

Q.53. A bag contains 3 red balls and 5 black balls. A ball is drawn at random from the bag. What is the probability that the ball drawn is not red?

Solution: Total number of balls in the bag=3+5=8
Probability of drawing a red ball
=Number of favourable outcomesThe total number of outcomes=Number of red ballTotal number of balls=38
Probability of not drawing a red ball =1- Probability of drawing a red ball
=1-38
=58

Q.54. A box contains 5 red marbles, 8 white marbles and 4 green marbles. One marble is taken out of the box at random. What is the probability that the marble taken out will be
red?

Solution: Total number of marbles =5+8+4=17
Number of red marbles =5
Probability of drawing a red marble
=Number of favourable outcomesTotal number of outcomes=Number of red marblesTotal number of marbles=517

Q.55. A box contains 5 red marbles, 8 white marbles and 4 green marbles. One marble is taken out of the box at random. What is the probability that the marble taken out will be white?

Solution: Total number of marbles =5+8+4=17

Number of white marbles =8

Probability of drawing a white marble

=Number of favourable outcomesTotal number of outcomes=Number of white marblesTotal number of marbles=817

Q.56. A box contains 5 red marbles, 8 white marbles and 4 green marbles. One marble is taken out of the box at random. What is the probability that the marble taken out will be not green?

Solution: Total number of marbles =5+8+4=17

Number of green marbles =4

Probability of drawing a green marble
=Number of favourable outcomesTotal number of outcomes=Number of green marblesTotal number of marbles=417 Hence, probability of not drawing a green marble =1-Probability of drawing a green marble=1-417=1317

Exercise 15.2

Q.1. Two customers Shyam and Ekta are visiting a particular shop in the same week (Tuesday to Saturday). Each is equally likely to visit the shop on any day as on another day. What is the probability that both will visit the shop on the same day?

Solution: There is a total 5 days (Tuesday to Saturday). Shyam can go to the shop on any of 5 days and Ekta can also go to the shop on 5 days.

So, total number of ways they can reach $=5\times5=25$ ways

They (Shyam, Ekta) can reach on same day in 5 ways, i.e.T,T,W,W,Th,Th,F,F,S,S. $\therefore$ P(both will reach on same day) $=525=15$.

Q.2. Two customers Shyam and Ekta are visiting a particular shop in the same week (Tuesday to Saturday). Each is equally likely to visit the shop on any day as on another day. What is the probability that both will visit the shop on consecutive days?

Solution: There are total 5 days (Tuesday to Saturday). Shyam can go to the shop on any of 5 days and Ekta can also go to the shop on 5 days.

So, total number of ways they can reach $=5\times5=25$ ways.

They (Shyam, Ekta) can reach on consecutive day in 8 ways, i.e.,T,W,W,Th,Th,F,F,S,W,T,Th,W,F,Th,S,F. $\therefore$ P(both will reach on consecutive days) $=825$.

Q.3. Two customers Shyam and Ekta are visiting a particular shop in the same week (Tuesday to Saturday). Each is equally likely to visit the shop on any day as on another day. What is the probability that both will visit the shop on different days?

Solution: There are total 5 days (Tuesday to Saturday). Shyam can go to the shop on any of 5 days and Ekta can also go to the shop on 5 days.

So, total number of ways they can reach $=5\times5=25$ ways.

They (Shyam, Ekta) can reach on same day in 5 ways, i.e.T,T,W,W,Th,Th,F,F,S,S. $\therefore$ P(both will reach on same day) $=525=15$. Since, P(both will reach on same days) $=15$ $\therefore$ P(both will reach on different days) $=1-15=45$.

Q.4. A die is numbered in such a way that its faces show the numbers 1,2,2,3,3,6. It is thrown two times and the total score in two throws is noted. Complete the following table which gives a few values of the total score on the two throws.

Number in first throw

Number in second throw	+	1	2	2	3	3	6
	1	2	3	3	4	4	7
	2	3	4	4	5	5	8
	2					5	
	3						
	3			5			9
	6	7	8	8	9	9	12

What is the probability that the total score is even?

Solution: The given table can be completed as below:

Number in first throw

Number in second throw	+	1	2	2	3	3	6
	1	2	3	3	4	4	7
	2	3	4	4	5	5	8
	2	3	4	4	5	5	8
	3	4	5	5	6	6	9
	3	4	5	5	6	6	9
	6	7	8	8	9	9	12

Total number of possible outcomes when the die is thrown two times $=6\times6=36$
Total number of outcomes when the sum is even $=18$
P (getting an even number) $=1836=12$

Q.5. A die is numbered in such a way that its faces show the numbers 1,2,2,3,3,6. It is thrown two times and the total score in two throws is noted. Complete the following table which gives a few values of the total score on the two throws.

Number in first throw

+	1	2	2	3	3	6
1	2	3	3	4	4	7
2	3	4	4	5	5	8
2					5	
3						
3			5			9
6	7	8	8	9	9	12

Number in second throw

What is the probability that the total score is 6?

Solution: The given table can be completed as below:

Number in first throw

+	1	2	2	3	3	6
1	2	3	3	4	4	7
2	3	4	4	5	5	8
2	3	4	4	5	5	8
3	4	5	5	6	6	9
3	4	5	5	6	6	9
6	7	8	8	9	9	12

Number in second throw

Total number of possible outcomes when the die is thrown two times $=6\times6=36$

Total number of outcomes when the sum is 6=4
P (getting sum as 6) $=436=19$

Q.6. A die is numbered in such a way that its faces show the numbers 1,2,2,3,3,6. It is thrown two times and the total score in two throws is noted. Complete the following table which gives a few values of the total score on the two throws:

Number in first throw

+	1	2	2	3	3	6
1	2	3	3	4	4	7
2	3	4	4	5	5	8
2					5	
3						
3			5			9
6	7	8	8	9	9	12

Number in second throw

What is the probability that the total score is at least 6?

Solution: The given table can be completed as below:

Number in first throw

+	1	2	2	3	3	6
1	2	3	3	4	4	7
2	3	4	4	5	5	8
2	3	4	4	5	5	8
3	4	5	5	6	6	9
3	4	5	5	6	6	9
6	7	8	8	9	9	12

Number in second throw

Total number of possible outcomes when the die is thrown two times $=6\times6=36$
Total times when the sum is at least 6=15
P (getting sum at least 6) $=1536=512$

Q.7. A bag contains 5 red balls and some blue balls. If the probability of drawing a blue ball is double that of a red ball, determine the number of blue balls in the bag.

Solution: Let the number of blue balls be x.

Number of red balls =5

Total number of balls =x+5 P (getting a red ball) =5x+5 P (getting a blue ball) =xx+5

As per the given information,

25x+5=xx+5

⇒10x+5=x2+5x ⇒x2-5x-50=0 ⇒x2-10x+5x-50=0 ⇒xx-10+5x-10=0 ⇒x-10x+5=0 ⇒x-10=0 or x+5=0 ⇒x=10 or x=-5 Hence, number of blue balls is 10. (Since, the number of balls cannot be negative)

Q.8. A box contains 12 balls out of which x are black. If one ball is drawn at random from the box, what is the probability that it will be a black ball? If 6 more black balls are put in the box, the probability of drawing a black ball is now double the probability of drawing black ball earlier. Find x.

Solution: Total number of balls =12

Total number of black balls =x

P(getting a black ball)=x12 Now, 6 more black balls are put in the box. Total number of balls =12+6=18 Total number of black balls =x+6 P(getting a black ball now) =x+618

As per the given information,

2x12=x+618

3x=x+6 2x=6 x=3

Q.9. A jar contains 24 marbles, some are green and others are blue. If a marble is drawn at random from the jar, the probability that it is green is 23. Find the number of blue marbles in the jar.

Solution: Total Number of marbles =24

Let the total number of green marbles be x.
∴ Total number of the blue marbles =24-x

P (getting a green marble) =x24

As per the given information,
x24=23

x=16

Hence, the total number of green marbles in the jar =16
Hence, total number of blue marbles =24-16=8