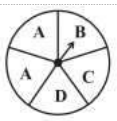
#463422



List the outcomes you can see in these experiments.

(a) Spinning a wheel (b) Tossing two coins together

Solution

(a) Possible outcomes would be: A, B, C, D

(b) Possible outcomes: HT, HH, TH, TT

#463423

When a die is thrown, list the outcomes of an event of getting

(i) (a) a prime number (b) not a prime number.

(ii) (a) a number greater than 5 (b) a number not greater than 5

Solution

Possible outcomes: 1, 2, 3, 4, 5, 6

(i) (a) Prime numbers: 2, 3, 5

It represents the outcomes of Prime numbers

(b) Not a prime number: 1, 4, 6

It represent the outcomes of not a prime numbers.

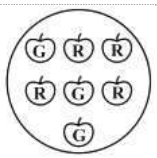
(ii) (a) Number greater than 5:

Only when 6 comes

(b) Number not greater than 5:

Only when outcomes: 1, 2, 3, 4 and 5

#463424



Find the

(a) Probability of the pointer stopping on D in spinning a wheel if it has A, A, D, B, C written on it?

(b) Probability of getting an ace from a well shuffled deck of 52 playing cards?

(c) Probability of getting a red apple from the figure given above.

Solution

(a) The pointer can stop at one of following regions A, A, B, C, D.

Only in $\perp$ case that pointer will stop at region D.

Probability: $\frac{1}{5}$

(b) There are 52 cards: 4 ace cards

Probability of getting an ace card

$= \frac{4}{52} = \frac{1}{13}$

(c) There are a total of 7 apple, out of which 4 are red, 3 are green.

Probability of red apple $= \frac{4}{7}$

#463426

Numbers 1 to 10 are written on ten separate slips (one number on one slip), kept in a box and mixed well. One slip is chosen from the box without looking into it. What is the probability of?

(i) getting a number 6?

(ii) getting a number less than 6?

(iii) getting a number greater than 6?

(iv) getting a 1-digit number?

Solution

(i) Total slips: 10

Probability of getting a number 6 $\Rightarrow \frac{1}{10}$

(ii) Numbers less than 6 : 1, 2, 3, 4, 5

Probability $\Rightarrow \frac{5}{10} = \frac{1}{2}$

(iii) Number greater than 6 are 7, 8, 9, 10

Probability $\Rightarrow 6 \Rightarrow \frac{4}{10} = \frac{2}{5}$

(iv) Single digit: 1, 2, 3, 4, 5, 6, 7, 8, 9

Probability $= \frac{9}{10}$

#463427

If you have a spinning wheel with 3 green sectors, 1 blue sector and 1 red sector, what is the probability of getting a green sector? What is the probability of getting a non blue sector?

Solution

Total sectors $= 3 + 1 + 1 = 5$

Probability of getting green sector $= \frac{3}{5}$

Non-Blue sector: Green sector or Red sector

Probability of getting non-blue $= \frac{4}{5}$

#463428

Find the probabilities of the events:

When a die is thrown, list the outcomes of an event of getting

(i) (a) a prime number (b) not a prime number.

(ii) (a) a number greater than 5 (b) a number not greater than 5

Solution

(i) (a)

Out of 6 possible outcomes, a prime number can be obtained in 3 cases.

Probability of prime number $= \frac{3}{6} = \frac{1}{2}$

(i) (b)

Out of 6 possible outcomes, a prime number not obtained in 3 cases

Probability $= \frac{3}{6} = \frac{1}{2}$

(ii) (a)

Out of 6 possible outcomes, greater than 5 can be obtained 1 case

Probability $= \frac{1}{6}$

(ii) (b)

Out of 6 possible outcomes, a number not greater than 5 can be obtained in: 5 cases

Probability $= \frac{5}{6}$

#464462

Activity: Note the frequency of two-wheelers, three-wheelers and four-wheelers going past during a time interval, in front of your school gate. Find the probability that any one vehicle out of the total vehicles you have observed is a two-wheeler.

Solution

Lets assume a case:

Number of 2 wheelers passed = 18

Number of 3 wheelers passed = 23

Number of 4 wheelers passed = 19

The time interval is 15 minutes for all the 3 conditions.

Total number of vehicles passed = Number of 2 wheelers + Number of 3 wheelers + Number of 4 wheelers

= 18 + 23 + 19 = 60

Probability that one vehicle out of total vehicles is 2 wheelers $= \frac{18}{60} = \frac{3}{10}$

#464463

In a class of 40 students, ask them to write a 3-digit number. Choose any student at random. What is the probability that the number written by her/him is divisible by 3?

Remember that a number is divisible by 3, if the sum of its digits is divisible by 3.

Solution

Total number of students in the class $= 40$

and out of 40 students, number divisible would be:

Case : Number divisible by 3 or Sum of its digits divisible by 3

Total 3 digit numbers $=$ 100 to 999

$= 900$ numbers

First number divisible is greater than 100, i.e., $= 102$

Now add 3 to 102 till 999

$a = 102$ Common difference $d = 3$

$n =$? Last number $= 999$

$\Rightarrow 999 = a + (n - 1)d$

$\Rightarrow 999 = 102 + (n - 1)3$

$\Rightarrow \frac{897}{3} = n - 1, n = 300$

Probability $= \frac{300}{900} = \frac{1}{3}$

#465252

Complete the following statements:

(i) Probability of an event E + Probability of the event not E $=$ _____.

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

(iii) The probability of an event that is certain to happen is _____. Such an event is called _____.

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

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

Solution

(i) Probability of event E and probability of event not $E = P(E) + P(\bar{E}) = \mathbf{1}$

(ii) Probability of ab event that cannot happen is **zero (0)**, Such an event is called **Impossible Events**.

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

(iv) The sum of the probabilities of all the elementary events of an experiment is $\sum_{i=1}^{n} P(E_i) = \mathbf{1}$.

(v) The probability of an event is greater than or equal to **zero(0), impossible event** and less than or equal to **1, sure or certain event**.

#465253

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

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

(ii) A player attempts to shoot a basketball. She/he shoots or misses the shot.

(iii) A trial is made to answer a true-false question. The answer is right or wrong.

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

Solution

i) Equally likely outcome because either the car starts or does not. There can be no other possibility.

ii) Equally likely outcome because either the goes through the basket or it does not. There can be no other possibility.

iii) Equally likely outcome because in a true or false type of question, either the answer is correct or wrong. There can be only 2 possibilities or no other possibility.

iv) Equally likely outcome because either the child born is a girl or a boy. There can be no other possibility.

#465254

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, there is an equally likely outcome of getting either a head or a tail, so tossing a coin is a fair way of deciding.

#465255

Which of the following cannot be the probability of an event?

A $\frac{2}{3}$

B -1.5

C 15%

D 0.7

Solution

-1.5 cannot be a probability of an event as the probability of an event always lies between 0 and 1.

#465257

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

(i) an orange flavoured candy?

(ii) a lemon flavoured candy?

Solution

i) Since the bag contains only lemon candies, the probability of picking an orange flavored candy does not arise.

So, P(orange candy) $= 0$.

ii) Since the bag contains only lemon candies, the probability of picking a lemon flavored candy is certain

So, P(lemon candy) $= 1$.

#465258

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

Let $\bar{B} \equiv$ Event that 2 students do not have same birthday

$\therefore P(\bar{B}) = 0.992$

So, probability of 2 students having same birthday $P(B) = 1 - P(\bar{B})$

$= 1 - 0.992$

$= 0.008$

#465260

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 ? (ii) not red?

Solution

Total number of balls in the bag $= 3 + 5 = 8$

i) P(red ball) $= \frac{3}{8}$ [probability = no. of red balls/total number of balls]

ii) P(not red) $= \frac{5}{8}$ [probability = no. of non red balls/total number of balls]

#465261

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 (i) red ? (ii) white ? (iii) not green?

Solution

Total number of marbles in the box $= 5 + 8 + 4 = 17$

i) P(red) = no. of red marbles/total number of marbles

$P(\text{red}) = \frac{5}{17}$

ii) P(white) = no. of white marbles/total number of marbles

$P(\text{white}) = \frac{8}{17}$

iii) P(green) = no. of green marbles/total number of marbles

$P(\text{green}) = \frac{4}{17}$

$P(\text{not green}) = 1 - P(\text{green}) = \frac{13}{17}$

#465262

A piggy bank contains hundred 50p coins, fifty c 1 coins, twenty c 2 coins and ten c 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 (i) will be a 50p coin ? (ii) will not be a c 5 coin?

Solution

Total number of coins in the piggy bank $= 100 + 50 + 20 + 10 = 180$.

i)

$P(50p \text{ coin}) = \frac{\text{number of 50p coins}}{\text{total number of coins}} = \frac{100}{180}$

$P(50p \text{ coin}) = \frac{5}{9}$

ii)

Number of c 5 coins $= 10$

Number of coins which are not c 5 $= 170$

$P(\text{coin not being } c\ 5) = \frac{170}{180} = \frac{17}{18}$

#465265

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 fish in the tank $= 13$

$P(\text{Male fish}) = \frac{\text{Number of male fish}}{\text{Total number of fish}}$

$P(\text{Male fish}) = \frac{5}{13}$

#465266

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

(i) 8?

(ii) an odd number?

(iii) a number greater than 2?

(iv) a number less than 9?

Solution

i) $P(8) = \frac{1}{8}$

ii)

$$P(\text{Odd number}) = \frac{\text{Number of odd numbers}}{\text{Total number of numbers in the chart}}$$

$$P(\text{Odd number}) = \frac{4}{8} = \frac{1}{2}$$

iii)

$$P(\text{Number } > 2) = \frac{\text{Number of numbers} > 2}{\text{Total number of numbers in the chart}}$$

$$P(\text{Number } > 2) = \frac{6}{8} = \frac{3}{4}$$

iv)

$$P(\text{Number } < 9) = \frac{\text{Number of numbers} < 9}{\text{Total number of numbers in the chart}}$$

$$P(\text{Number } < 9) = \frac{8}{8} = 1$$

#465268

A die is thrown once. Find the probability of getting

(i) a prime number; (ii) a number lying between 2 and 6; (iii) an odd number

Solution

Sample space $= \{1, 2, 3, 4, 5, 6\}$

i) $P(\text{Prime number}) = \frac{\text{Number of prime numbers}}{\text{Sample space}}$

$P(\text{Prime number}) = \frac{3}{6} = \frac{1}{2}$

ii) $P(\text{Number between 2 and 6} = \frac{3}{6} = \frac{1}{2}$

iii) $P(\text{Odd number}) = \frac{3}{6} = \frac{1}{2}$

#465269

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

(i) a king of red colour (ii) a face card (iii) a red face card (iv) the jack of hearts (v) a spade (vi) the queen of diamonds

Solution

i) King of red colour can be hearts King or a diamond king.

So, the possibility is 2.

$P(\text{Red king}) = \frac{2}{52} = \frac{1}{26}$

ii) A face card can be jack, queen, king of any suite.

In this way we will get $3 \times 4 = 12$ face cards.

$P(\text{Face card}) = \frac{12}{52} = \frac{3}{13}$

iii) A red face card can be either hearts or diamond king, jack or queen, which means there are $3 \times 2 = 6$

$P(\text{Red face card}) = \frac{6}{52} = \frac{3}{26}$

iv) There is only one Jack of hearts.

$P(\text{Jack of hearts}) = \frac{1}{52}$

v) There are 13 spades in total.

So, $P(\text{Spade}) = \frac{13}{52} = \frac{1}{4}$

vi) There is only one queen diamond.

Hence, $P(\text{Queen diamond}) = \frac{1}{52}$

#465270

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.

(i) What is the probability that the card is the queen?

(ii) If the queen is drawn and put aside, what is the probability that the second card picked up is (a) an ace? (b) a queen?

Solution

i) Total number of cards $n(S) = 5$

Let $Q \equiv$ Event that queen of diamonds is drawn.

$\therefore n(Q) = 1$

So, $P(Q) = \frac{n(Q)}{n(S)} = \frac{1}{5}$

ii)

a) If the queen is put aside, then the total number of cards $n(S) = 4$

Let $A \equiv$ Event that ace of diamonds is drawn.

$\therefore n(A) = 1$

So, $P(A) = \frac{n(A)}{n(S)} = \frac{1}{4}$

b) If the queen is put aside, then the total number of cards $n(S) = 4$

Let $B \equiv$ Event that queen of diamonds is drawn.

$\therefore n(B) = 0$ ...Since the queen was already put aside.

So, $P(B) = \frac{n(B)}{n(S)} = 0$

#465271

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

Number of good pens = 132

Number of defective pens = 12

Total number of pens = 132 + 12 = 144

$P(\text{Good pen}) = \frac{132}{144} = \frac{11}{12}$

#465272

(i) 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?

(ii) Suppose the bulb drawn in (i) 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

i) $P(\text{Defective bulb}) = \frac{\text{Defective Bulbs}}{\text{Total Bulbs}} = \frac{4}{20} = \frac{1}{5}$

ii) Since one bulb is already drawn, the number of bulbs remaining is 19.

Number of non defective bulbs is 15 as one bulb is picked.

$P(\text{Non-defective}) = \frac{15}{19}$.

#465273

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 (i) a two-digit number (ii) a perfect squar number (iii) a number divisible by 5

Solution

i) Number of 2 digit numbers from 1 to 90 = 81.

$P(\text{2 digit number}) = \frac{81}{90} = \frac{9}{10}$

ii) Number of perfect squares between 1 and 90 = (1, 4, 9, 16, 25, 36, 49, 64, 81) = 9

$P(\text{Perfect square}) = \frac{9}{90} = \frac{1}{10}$

iii) Multiples of 5 are 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90

Number of multiples of 5 = 18

$P(\text{Multiples of 5}) = \frac{18}{90} = \frac{1}{5}$

#465274

A child has a die whose six faces show the letters as given below:

The die is thrown once. What is the probability of getting (i) A? (ii) D?

Solution

Total possible outcomes when a dice is thrown $n(S) = 6$

i) $A \equiv$ Event that A shows up on the dice.

$\therefore n(A) = 2$

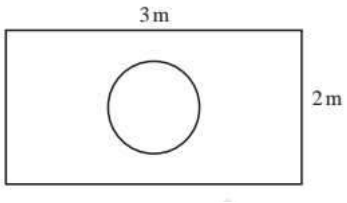
$P(A) = \frac{n(A)}{n(S)} = \frac{2}{6} = \frac{1}{3}$

ii) $D \equiv$ Event that D shows up on the dice.

$\therefore n(A) = 1$

$P(D) = \frac{n(D)}{n(S)} = \frac{1}{6}$

#465275



Suppose you drop a die at random on the rectangular region shown in fig. What is the probability that it will land inside the circle with diameter $1m$?

Solution

Area of the circle = $\pi r^2 = \frac{\pi(1)^2}{4} = \frac{\pi}{4}$ sq m.

Area of the rectangle $= 3 \times 2 = 6$ sq m.

P(Die will land in the circle) = $\frac{\text{Area of circle}}{\text{Area of rectangle}} = \frac{\pi}{24}$

P(Die will land in the circle) = $\frac{\pi}{24}$

#465276

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 p
at random and gives it to her. What is the probability that

(i) She will buy it ?

(ii) She will not buy it ?

Solution

Total number of pens $= 144$

No. of defective pens $= 20$

No. of good pen $= 124$

i) P(Good pen) = $\frac{124}{144} = \frac{31}{36}$

ii) P(Defective pen) = $\frac{20}{144} = \frac{5}{36}$

#465279

(i) Complete the following table:

Event: 'Sum on 2 dice'	2	3	4	5	6	7	8	9	10	11	12
Probability	$\frac{1}{36}$						$\frac{5}{36}$				$\frac{1}{36}$

(ii) 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 $\frac{1}{11}$. Do you agree with this argument?
Justify your answer.

Solution

Event: Sum of 2 dice	2	3	4	5	6	7	8	9	10	11	12
Probability	$\frac{1}{36}$	$\frac{2}{36}$	$\frac{3}{36}$	$\frac{4}{36}$	$\frac{5}{36}$	$\frac{6}{36}$	$\frac{5}{36}$	$\frac{4}{36}$	$\frac{3}{36}$	$\frac{2}{36}$	$\frac{1}{36}$

(i) From the table it can be observed that,

To get sum as 2, possible outcomes = (1, 1)

To get sum as 3, possible outcomes = (2, 1), (1, 2)

To get sum as 4, possible outcomes = (3, 1), (1, 3), (2, 2)

To get sum as 5, possible outcomes = (2, 3), (3, 2), (1, 4), (4, 1)

To get sum as 6, possible outcomes = (1, 5), (5, 1), (2, 4), (4, 2), (3, 3)

To get sum as 7, possible outcomes = (1, 6), (6, 7), (3, 4), (4, 3), (2, 5), (5, 2)

To get sum as 8, possible outcome = (2, 6), (6, 2), (3, 5), (5, 3), (4, 4)

To get sum as 9, possible outcomes = (3, 6), (6, 3), (4, 5), (5, 4)

To get sum as 10, possible outcome = (4, 6), (6, 4), (5, 5)

To get sum as 11, possible outcome = (5, 6), (6, 5)

To get sum as 12, possible outcome = (6, 6)

(ii) The probability of each of these sums will not be $\frac{1}{11}$, as these sums are not equally likely.

#465280

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

Sample space = {*HHH*, *HHT*, *HTH*, *HTT*, *THH*, *THT*, *TTH*, *TTT*}

Outcomes when he does not choose 3 heads or 3 tails = {*HHT*, *HTH*, *HTT*, *THH*, *THT*, *TTH*}

Probability of losing $= \frac{6}{8} = \frac{3}{4}$

#465281

A die is thrown twice. What is the probability that

(i) 5 will not come up either time? (ii) 5 will come up at least once?

Solution

Throwing a die twice and throwing two dice simultaneously are treated as the same experiment.

Sample space = {(1, 1), (1, 2), (1, 3), (1, 4), (1, 5), (1, 6)
(2, 1), (2, 2), (2, 3), (2, 4), (2, 5), (2, 6)
(3, 1), (3, 2), (3, 3), (3, 4), (3, 5), (3, 6)
(4, 1), (4, 2), (4, 3), (4, 4), (4, 5), (4, 6)
(5, 1), (5, 2), (5, 3), (5, 4), (5, 5), (5, 6)
(6, 1), (6, 2), (6, 3), (6, 4), (6, 5), (6, 6)}

i) *P*(5 will not come up either time) = Number of times 5 does not show divided by total number of outcomes

P(5 will not come up either time) = $\frac{25}{36}$

ii) *P*(5 will come up at least once) = Number of times 5 shows up at least once divided by total number of outcomes

P(5 will come up at least once) = $\frac{11}{36}$

#465285

Which of the following arguments are correct and which are not correct? Give reasons for your answer.

(i) 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 $\frac{1}{3}$

(ii) 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 $\frac{1}{2}$

Solution

i) Possible outcomes $= \{HH, HT, TH, TT\}$

The number of outcomes is 4.

Hence, the probability for each of these outcomes $= \frac{1}{4}$

The argument is false.

ii) Possible outcomes $= \{1, 2, 3, 4, 5, 6\}$

$P(\text{Odd number}) = \frac{\text{Number of odd numbers shown}}{\text{Total outcomes}}$

$P(\text{Odd number}) = \frac{3}{6} = \frac{1}{2}$

The argument is correct.

#465286

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 (i) the same day? (ii) consecutive days? (iii) different days?

Solution

i) Possibility of visiting the shop on same day $= \{(tue, tue), (wed, wed), (thurs, thurs), (fri, fri), (sat, sat)\}$

Total outcomes is $5 \times 5 = 25$

P(on the same day) $= \frac{5}{25} = \frac{1}{5}$

ii) Possibility of visiting the shop on consecutive days $= \{(tue, wed), (wed, thurs), (thurs, fri), (fri, sat), (thurs, wed), (fri, thurs), (sat, fri), (wed, tue)\}$

Total outcomes is 25.

P(on consecutive days) $= \frac{8}{25}$

iii) Possibility of visiting the shop on different days $= \{tue, wed, thurs, fri, sat\}$

P(on different days) $= 1 -$ P(on same day) $= 1 - \frac{1}{5} = \frac{4}{5}$

#465288

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

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:

What is the probability that the total score is

(i) even? (ii) 6? (iii) at least 6?

Solution

+	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 no. of possible outcomes when 2 dice are thrown $6 \times 6 = 36$

i) Total times when the sum is even $= 18$

P(Getting an even no.) $= \frac{18}{36} = \frac{1}{2}$

ii) Total times when the sum is 6 $= 4$

P(Getting sum as 6) $= \frac{4}{36} = \frac{1}{9}$

iii) Total times when the sum is atleast 6 $= 15$

P(Getting sum atleast 6.) $= \frac{15}{36} = \frac{5}{12}$

#465289

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 there be x blue balls.

So, the total number of balls $= x + 5$

P(Blue ball) $= \frac{x}{(x+5)}$

P(Red ball) $= \frac{5}{(x+5)}$

Given,

P(Blue) $= 2 \times$ P(Red)

$\frac{x}{(x+5)} = 2 \times \frac{5}{(x+5)}$

Solving, we get x as 10.

So, the number of blue balls $= 10$.

#465290

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 of what it was before. Find x.

Solution

Initially, total number of balls $= 12$

No. of black balls $= x$

So, P(black ball) $= \frac{x}{12}$

If 6 more black balls are added, total number of balls $= 12 + 6 = 18$

NO. of black balls $= x + 6$

P(black ball) $= \frac{x+6}{18}$

Given the probability of drawing a black ball is now double of what it was before

So, $\frac{2x}{12} = \frac{(x+6)}{18}$

$\frac{x}{6} = \frac{(x+6)}{18}$

$3x = x + 62x = 6x = 3$

So, the number of black balls present initially $= 3$.

#465292

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 $\frac{2}{3}$. Find the number of blue balls in the jar.

Solution

Total number of marbles $= 24$

Let there be x green marbles and $(24 - x)$ blue marbles.

P(green) $= \frac{x}{24} = \frac{2}{3}$

Solving, we get x as 16.

So, the number of green marbles $= 16$ and blue marbles $= 24 - 16 = 8$ marbles.