



# MATHS

**BOOKS - VK GLOBAL PUBLICATION**

**MATHS (HINGLISH)**

## PROBABILITY

**Very Short Answer Questions State True Or False  
And Give The Reason**

1. If I toss a coin 3 times and get head and get head each time, should I expect a tail to have a higher chance in the 4th toss? Give a reason in support of your answer.



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2. A bag contains slips numbered from 1 to 100. If Fatima chooses a slip at random from the bag, it will either be an odd number or an even number. Since, this situation has only two

possible outcomes, so the probability of each is  $\frac{1}{2}$ . Justify



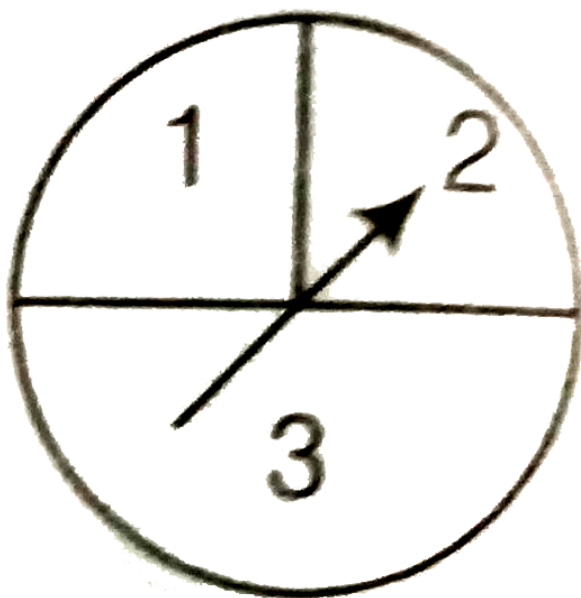
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**3.** If a family having three children, there may be no girl, one girl, two girls or three girls. So, the probability of each is  $\frac{1}{4}$ . Is this correct? Justify your answer.



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4. A game consists of spinning an arrow which comes to rest pointing at one of regions (1, 2 or 3) (see figure). Are the outcomes 1, 2 and 3 equally likely to occur? Give reason



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## Very Short Answer Questions

1. Two coins are tossed simultaneously. Find the probability of getting exactly one head.



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2. From a well shuffled pack of cards, a card is drawn at random. Find the probability of getting a black queen.



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3. If  $P(E) = 0.05$   $P(E) = 0.05$ , what is the probability of not E?



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4. What is the probability of getting no head when two coins are tossed simultaneously?



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5. In a single throw a pair of dice, the probability of getting the sum a perfect square is  $\frac{1}{18}$  (b)  $\frac{7}{36}$  (c)  $\frac{1}{6}$  (d)  $\frac{2}{9}$



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6. Someone is asked to take number from 1 to 100. The probability that it is a prime, is



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7. Cards marked with numbers 3, 4, 5, ..., 50 are placed in a box and mixed thoroughly. A card is drawn at random from the box, find the probability that the selected card bears a perfect square number.



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8. A card is drawn at random from a well shuffled pack of 52 playing cards. Find



probability of getting neither a red card nor a queen.



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9. 20 tickets, on which numbers 1 to 20 are written, are mixed thoroughly and then a ticket is drawn at random out of them. Find the probability that the number on the drawn ticket is a multiple of 3 or 7.



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## Short Answer Questions I

1. Two dice are thrown at the same time and the product of numbers appearing on them is noted. Find the probability that the product is a prime number.



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2. Find the probability that a number selected from the number 1 to 25 is not a prime

number when each of the given numbers is equally likely to be selected.



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**3.** One card is drawn at random from a pack of 52 cards. Find the probability that the card drawn is an ace and black.



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4. A card is drawn at random from a pack of 52 playing cards. Find the probability that the card drawn is neither an ace nor a king.



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5. 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?



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6. 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

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7. Two players, Sangeeta and Reshma, play a tennis match. It is known that the probability of Sangeeta winning the match is 0.62. What is the probability of Reshma winning the match?



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8. 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?



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**9.** A card is drawn at random from a well shuffled pack of 52 cards. Find the probability that the card drawn is neither a red card nor a queen.



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**10.** Out of 400 bulbs in a box, 15 bulbs are defective. One bulb is taken out at random from the box. Find the probability that the drawn bulb is not defective.



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11. Two coins are tossed simultaneously. What is the probability of getting at least one tail ?



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## Short Answer Questions li

1. Harpreet tosses two different coins simultaneously (say, one is of Re 1 and other of



Rs 2). What is the probability that he gets at least one head?



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2. A game consists of tossing a one-rupee coin three 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.



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3. Three unbiased coins are tossed together.

Find the probability of getting:

(i) all heads.

(ii) exactly two heads.

(iii) exactly one head.

(iv) at least two heads.

(v) at least two tails



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4. 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.



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5. Suppose we throw a die once, (i) What is the probability of getting a number greater than 4? (ii) What is the probability of getting a number less than or equal to 4 ?



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6. One card is drawn from a well-shuffled deck of 52 cards. Calculate the probability that the card will (i) be an ace. (ii) not be an ace.



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7. 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



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8. 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 ?



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**9.** A bag contains 5 black, 7 red and 3 white balls. A ball is drawn from the bag at random.

Find the probability that the ball drawn is :

(i) red (ii) black or white (iii) not black.



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**10.** A bag contains 5 red, 8 white and 7 black balls. A ball is drawn at random from the bag.

Find the probability that the drawn ball is (i) red or white (ii) not black (iii) neither white nor black.



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**11.** 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?



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**12.** 1000 tickets of a lottery were sold and there are 5 prizes on these tickets. If Saket has

purchased one lottery ticket, what is the probability of winning a prize?



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**13.** In a single throw of a pair of different dice, what is the probability of getting

(i) a prime number on each dice

(ii) a total of 9 or 11?



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**14.** A game consists of tossing a one-rupee coin three 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.



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**Long Answer Questions**

1. 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.



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2. One card is drawn from a pack of 52 cards, each of the 52 cards being equally likely to be drawn. Find the probability that the card drawn is:

(i) an ace.

(ii) red.

(iii) either red or king.

(iv) red and a king.

(v) a face card.

(vi) a red face card.

(vii) '2' of spades.

(viii) '10' of a black suit.



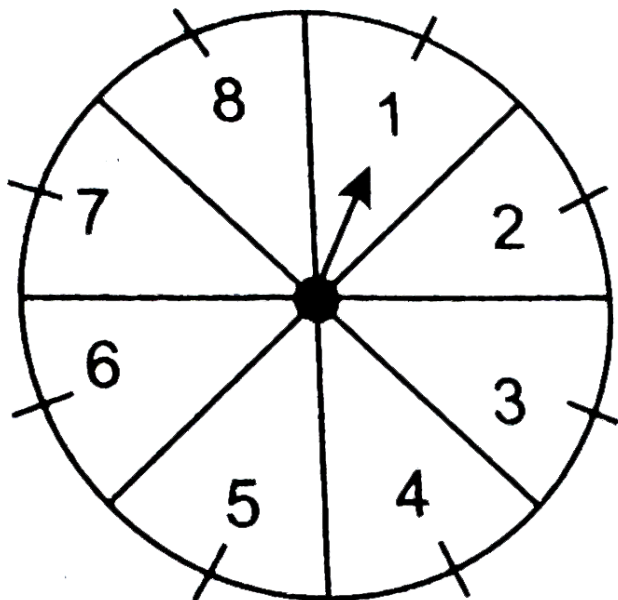
3. संयोग के एक खेल में, एक तीर को घुमाया जाता है, जो विश्राम में आने के बाद संख्याओं 1 , 2 , 3 , 4 , 5 , 6 , 7 और 8 में से किसी एक संख्या को इंगित करता है । यदि ये सभी परिणाम समप्रायिक हों, तो इसकी क्या प्रायिकता है कि यह तीर इंगित

(i ) 8 को इंगित करेगा ?

(ii ) एक विषम संख्या को करेगा

(iii ) 2 से बड़ी संख्या को करेगी ?

(iv) 9 से छोटी संख्या को करेगा ?



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4. Two dice, one blue and one grey, are thrown at the same time. Write down all the possible outcomes. What is the probability that the

sum of the two numbers appearing on the top of the dice is (ii) 13? (iii) less than or equal to 12?



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**5.** A bag contains cards numbered from 1 to 49. A card is drawn from the bag at random, after mixing the card thoroughly. Find the probability that the number on the drawn card is (i) an odd number (ii) a multiple of 5

(iii) a perfect square (iv) an even prime number.



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6. All the black face cards are removed from a pack of 52 playing cards.

The remaining cards are well shuffled and then a card is drawn at random. Find the probability of getting a (i) face card, (ii) red card, (iii) black card, (iv) king.



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7. Cards numbered from 11 to 60 are kept in a box. If a card is drawn at random from the box, find the probability that the number on the drawn cards is (i) an odd number (ii) a perfect square number (iii) divisible by 5. (iv) a prime number less than 20.



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8. A number  $x$  is selected at random from the numbers 1, 2, 3 and 4. Another number  $y$  is



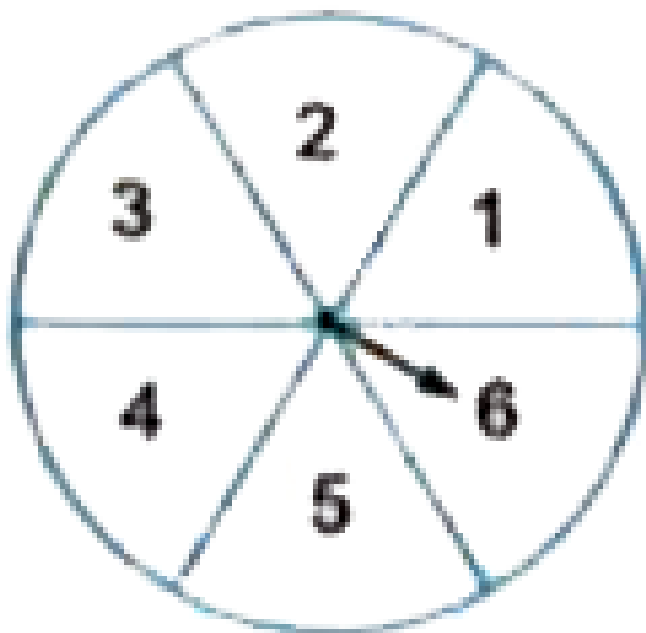
selected at random from the numbers 1, 4, 9 and 16. Find the probability that product of  $x$  and  $y$  is less than 16.



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**9.** In Fig., shown a disc on which a player spins an arrow twice. The function  $\frac{a}{b}$  is formed, where 'a' is the number of sector on which arrow stops on the first spin and 'b' is the number of the sector in which the arrow stops on second spin. On each spin, each sector has

equal chance of selection by the arrow. Find the probability that the fraction  $\frac{a}{b} > 1$ .



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**Higher Order Thinking Skills**

1. 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? Hint [Throwing a die twice and throwing two dice simultaneously are same experiment] treated as the



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2. The probability of getting 53 Fridays in a leap year is :



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3. A bag contains 5 red balls and some blue balls. If the probability of drawing a blue ball from the bag is thrice that of a red ball, find the number of blue balls in the bag.



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4. Apoorv throws two dice once and computes the product of the numbers appearing on the dice. Peehu throws one side one die and

squares the number that appears on it. Who has the better chance of getting the number of 36? Why?



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## Proficiency Exercise Very Short Answer Questions

1. A card is accidentally dropped from a pack of 52 cards. What is the probability of it being a card of diamond?



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2. A card is drawn from a well shuffled pack of 52 playing cards. The event  $E$  is that the card drawn is not a face card. The number of outcomes favourable to the event  $E$  is



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3. In a single throw of a die, what is the probability of getting a prime number?



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4. An integer is chosen at random from the numbers ranging from 1 to 50. What is the probability that the integer chosen is a multiple of 2 or 3 or 10?



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5. The probability of getting a bad egg in a lot of 400 is 0.035. The number of bad eggs in the lot is



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6. A number  $x$  is chosen at random from the numbers  $-3, -2, -1, 0, 1, 2, 3$  the probability that  $|x| < 2$  is  $\frac{5}{7}$  (b)  $\frac{2}{7}$  (c)  $\frac{3}{7}$  (d)  $\frac{1}{7}$



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7. A bag contains 3 black marbles, 5 red marbles and 6 white marbles. If a marble is



picked at random, then what is the probability that it is not a white marble?



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8. Avni and Arushi draws one ball each from a bag containing 2 red and 3 green balls. Avni draws a red ball first which is not put back. What is the probability that Arushi who draws next also gets a red ball?



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**9.** A digit is chosen at random from the digits 1 to 9. What is the probability that the digit is even?



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**10.** A letter of English alphabet is chosen at random. What is the probability that it is a letter of the word 'MATHEMATICS'?



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## Proficiency Exercise Short Answer Questions I

### State True Or False And Justify Your Answer

1. The probability of getting a prime number when a die is thrown once is  $\frac{2}{3}$ .



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2. In any situation that has only two possible outcomes, each out come will have probability  $\frac{1}{2}$ . Find whether it is true or false.



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3. A student says that if you throw a die, it will show up 1 or not 1. Therefore, the probability of getting 1 and the probability of getting not 1 each is equal to  $\frac{1}{2}$ . Is this correct? Give reasons.



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4. A coin is tossed twice and the outcome is noted everytime. The head must come once is

two tosses.



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5. I toss three coins together. The possible outcomes are no heads, 1 head 2 head and 3 heads. So, I say that probability of no heads is  $\frac{1}{4}$ . What is wrong with this conclusion?



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**Proficiency Exercise Short Answer Questions I**

1. A bag contains 6 white balls numbered 1 to 6 and 4 red balls numbered 7 to 10. Find the probability of getting a:

(a) red ball with even number on it.

(b) an odd number ball.



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2. A card is drawn at random from a well shuffled pack of 52 playing cards. Find the probability of getting a red face card.





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3. What is the probability of getting a king when a card is drawn at random from a well-shuffled deck of 52 cards?



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4. A die is thrown once. What is the probability of getting an even number?



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5. Two coins are tossed simultaneously. What is the probability of getting at least one head?



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6. What is the probability of getting atmost one tail when two coins are tossed simultaneously?



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7. A letter of English alphabet is chosen at random. Determine the probability that the chosen letter is a consonant.



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8. If  $P(E) = 0.75$ , what is the probability of 'not E'?



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9. A bag contains 8 red pencils and 5 black pencils. What is the probability of getting a yellow pencil when one pencil is drawn at random?



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10. If probability of success is  $63\%$ , what is the probability of failure?



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**11.** There are 30 cards, of same size, in a bag on which numbers 1 to 30 are written. One card is taken out of the bag at random. Find the probability that the number on the selected card is not divisible by 3.



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**12.** In a simultaneous throw of a pair of dice, find the probability of getting a doublet.



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**13.** In a simultaneous throw of a pair of dice, find the probability of getting:  
a doublet of even numbers.



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**14.** In a simultaneous throw of a pair of dice, find the probability of getting:  
an even number on one and a multiple of 3 on the other.



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**15.** In a simultaneous throw of a pair of dice, find the probability of getting:  
  
neither 9 nor 11 as the sum of the numbers on the faces.



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**16.** In a simultaneous throw of a pair of dice, find the probability of getting:  
  
a sum less than 8.



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**17.** One card is drawn at from a pack of 52 cards. Find the probability that the card drawn is:  
  
red and a queen.



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**18.** One card is drawn at from a pack of 52 cards. Find the probability that the card drawn

is:

either red or a queen.



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**19.** A number is selected at random from first 50 natural numbers. Find the probability that it is a multiple of 3 and 4.



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**20.** Two different dice are rolled simultaneously. Find the probability that the sum of the numbers on the two dice is 10.



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**21.** Two different dice are tossed together. Find the probability that (i) the number on each die is even, (ii) the sum of the numbers appearing on the two dice is 5.



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## Proficiency Exercise Short Answer Questions li

1. Two dice are thrown at the same time. Find the probability of getting

(i) Same number on both dice.

(ii) different number of both dice.



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2. Two dice are thrown simultaneously. Find the probability of getting the sum

(i) 9. (ii) 1. (iii) a prime number.



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**3.** A coin is tossed three times. Find the probability of getting:

(i) all tails. (ii) at least two tails. (iii) atmost two tails.



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4. A coin is tossed 2 times. List the possible outcomes. Find the probability of getting:

(i) at least one head. (ii) atmost one head.



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5. Two dice are thrown at the same time. Determine the probability that the difference of the numbers on the two dice is :

(i) 0. (ii) 2.



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6. Two dice are thrown together and the product of numbers appearing on them is noted. Find the probability that the product is less than 12.



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7. A die its six faces marked 0,1,1,1,6,6. Two such dice are thrown together and the total is recorded.

(i) How many different scores are responsible

(ii) What is the probability



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**8.** A bag contains white, black and red ball only. A ball is drawn at random from the bag. If the probability of getting a white ball is  $\frac{3}{10}$  and that of a black ball is  $\frac{2}{5}$  then find the probability of getting a red ball. If the bag contains 20 black balls, find the total number of balls in the bag.



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9. A bag contains 7 green, 10 blue and 5 red balls. A ball is drawn at random. Find the probability of this ball being a:

(i) blue ball.

(ii) red ball or a green ball.

(iii) not a green ball.



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**10.** A bag contains 24 balls of which  $x$  are red,  $2x$  are white and  $3x$  are blue. A ball is selected at random. What is the probability that it is:  
(i) not white? (ii) blue?



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**11.** A die is thrown twice. What is the probability that:

(i) 3 will not come up either time?

(ii) 3 will come up at least once?





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**12.** A bag contains 8 red, 7 orange and 9 green balls. A ball is drawn at random from the bag. Find the probability that the drawn ball is :

(i) orange or green. (ii) not orange. (iii) neither green nor red.



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**13.** A card is drawn at random from a pack of 52 playing cards. Find the probability that the



card drawn is neither an ace nor a jack.



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**14.** A card is drawn at random from a pack of 52 playing cards. Find the probability that the card drawn is neither a black card nor a king.



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**15.** The king, queen and jack of diamond are removed from a deck of 52 playing cards and

then well shuffled. Now one card is drawn at random from the remaining cards. Determine the probability that the card is:

(i) a jack. (ii) a heart. (iii) a red queen.



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**16.** The king, queen and jack of diamond are removed from a deck of 52 playing cards and then well shuffled. Now one card is drawn at random from the remaining cards. What is the

probability that the card is:

(i) 10 of heart? (ii) a diamond? (iii) a face card?



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**17.** All the jacks, queens and kings are removed from a deck of 52 playing cards and then well shuffled. Then one card is drawn at random. If an ace is given a value 1, find the probability that the card has a value:

(i) 5. (ii) less than 5. (iii) greater than 5.



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**18.** Cards bearing numbers 1, 3, 5,.....,35 are kept in a bag. A card is drawn at random from the bag. Find the probability of getting a card bearing (i) a prime number less than 15. (ii) a number divisible by 3 and 5.



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**19.** A bag contains cards which are numbered from 2 to 90. A card is drawn at random from the bag. Find the probability that it bears (i) a

two digit number (ii) a number which is a perfect square



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**20.** An integer is chosen between 0 and 100.

What is the probability that it is:

(i) divisible by 9? (ii) not divisible by 9?



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**21.** A lot consists of 48 mobile phones of which 42 are good, 3 have only minor defects and 3 have major defects. Varnika will buy a phone if it is good but the trader will only buy a mobile, if it has no major defect. One phone is selected at random from the lot. What is the probability that it is

(i) acceptable to Varnika?

(ii) acceptable to the trader.



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**22.** A carton of 24 bulbs contain 6 defective bulbs. One bulb is drawn at random. What is the probability that the bulb is not defective? If the bulb selected is defective and it is not replaced and a second bulb is selected at random from the rest, what is the probability that the second bulb is defective?



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**23.** A child's game has 8 triangles of which 3 are blue and rest are red, and 10 squares of which 6

are blue and rest are red. One piece is lost at random. Find the probability that it is a

(i) triangle (ii) square

(iii) square of blue colour

(iv) triangle of red colour



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**24.** Box A contains 25 slips of which 19 are marked 1 and other are marked 5 each. Box B contains 50 slips of which 45 are marked 1 each and other are marked 13 each. Slips of



both boxes are poured into a third box and resuffled. A slip is drawn at random. What is the probability that it is marked other than 1?



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**25.** A lot of 60 bulbs contain 12 defective ones. One bulb is drawn at random from the lot. What is the probability that this bulb is defective? Suppose the bulb drawn in first attempt is 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?



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**26.** A bag contains tickets numbered 11, 12, 13, ....., 30. A ticket is taken out from the bag at random. Find the probability that the number on the drawn ticket (i) is a multiple of 7 (ii) is greater than 15 and a multiple of 5.



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**27.** Cards marked with numbers 13, 14, 15, ....., 16 are placed in a box and mixed thoroughly. One card is drawn at random from the box. Find the probability that number on the card drawn is (a) divisible by 5 (b) a number is a perfect square



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**28.** A bag contains 18 balls out of which  $x$  balls are red.

(i) If one ball is drawn at random from the bag

what is the probability that it is not red?

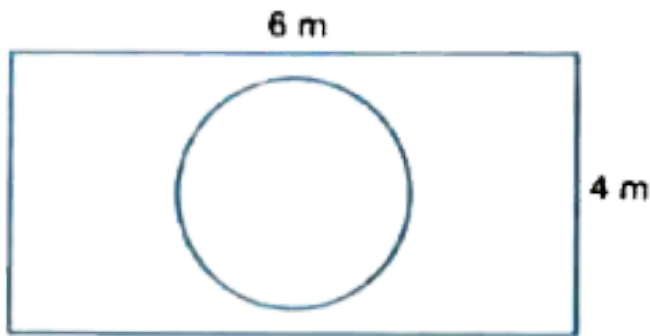
(ii) If two more red balls are put in the bag, the probability of drawing a red ball will be  $\frac{9}{8}$  times the probability of drawing a red ball in the first case. Find the value of  $x$ .



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**29.** 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 2m? (Take  $\pi = \frac{22}{7}$ )



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**30.** Ranjani and Kanika are friends. What is the probability that both will have:

(i) different birthdays?

(ii) the same birthday? (ignoring a leap year)



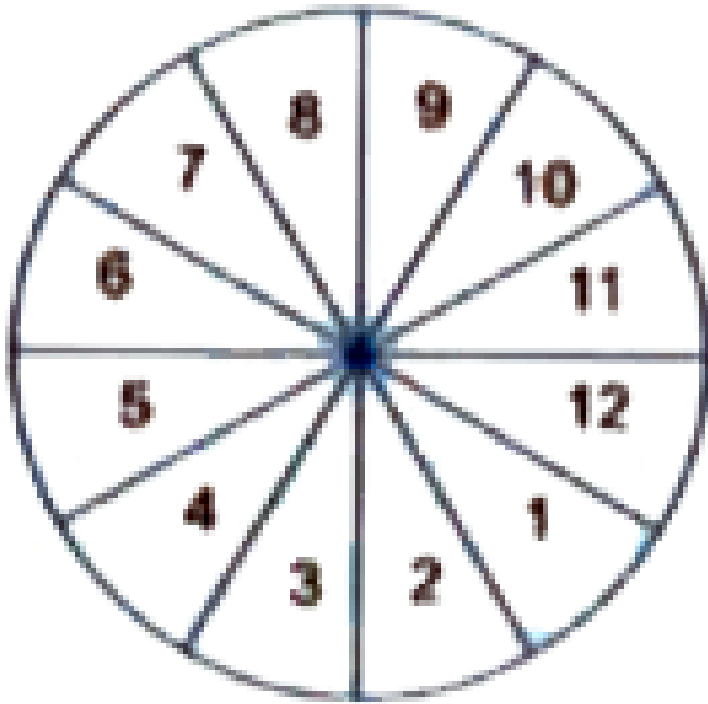
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## Proficiency Exercise Long Answer Questions

1. A game of chance consists of spinning an arrow which is equally likely to come to rest pointing to one of the numbers 1, 2, 3....., 12 as shown in the Fig. What is the probability that it will point to:

(i) 6? (ii) an even number? (iii) a prime

number? (iv) a multiple of 4?



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2. The probability of selecting a green marble at random from a jar that contains only green,

white and yellow marbles is  $\frac{1}{4}$  . The probability of selecting a white marble at random from the same jar is  $\frac{1}{3}$  . If this jar contains 10 yellow marbles. What is the total number of marbles in the jar?



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**3.** In a bag contains 20 cards numbered from 1 to 20. A card is drawn at random from the box. Find the probability that the number on the



drawn card is (i) divisibly by 2 or 3 (ii) a prime number



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4. In a game, the entry fee is of 5. The game consists of a tossing a coin 3 times. If one or two heads show. Sweta gets her entry fee back. If she throw 3 heads, she receives double the entry fees. Otherwise, she will lose. For tossing a coint three times, Find the probability that she

- (i) Loses the entry fee.
- (ii) gets double entry fee.
- (iii) just gets her entry fee.



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5. A jar contains 54 marbles each of which is blue, green or white. The probability of selecting a blue marble at random from the jar is  $\frac{1}{3}$ , and the probability of selecting a green marble at random is  $\frac{4}{9}$ . How many white marbles does the jar contain?



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6. Red queens and black jacks are removed from a pack of 52 playing cards. A card is drawn at random from the remaining cards, after reshuffling them. Find the probability that the card drawn is (i) a king (ii) of red colour (iii) a face card (iv) a queen



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7. Five cards- the ten, jack, queen, king and ace of diamonds, are well shuffled with their faces downwards. One card is then picked up at random.

(a) What is the probability that the drawn card is the queen?

(b) If the queen is drawn and put aside and a second card is drawn, find the probability that the second card is (i) an ace (ii) a queen.



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**8.** Cards numbered 1 to 30 are put in a bag. A card is drawn at random from this bag. Find the probability that the number on the drawn card is:

(i) not divisible by 3.

(ii) a prime number greater than 7.

(iii) not a perfect square number.



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**9.** A dice is rolled twice. Find the probability that:

(i) 6 will not come up either time.

(ii) 6 will come up exactly one time.



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**10.** A game of chance consists of spinning an arrow on a circular board, divided into 8 equal parts, which comes to rest pointing at one of the numbers 1, 2, 3 (Fig.), which are equally likely. What is the probability that the arrow outcomes will be at (i) an odd number (ii) a

number greater than 3 (iii) a number less than 9



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## Self Assessment Test

1. What is the probability of getting a sum greater than 10 when two dice are rolled together?



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2. What is the probability of raining on a clear sky day?



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3. What is the probability of getting an even number less than 4 when a die is thrown?



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4. A card is drawn from a deck of 52 cards. The event E is that it is not a queen of black colour. What is the number of favourable outcomes?



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5. If you toss a coin 6 times it comes down head on each occasion Can you say that the probability of getting a head is  $\frac{1}{2}$ ? Give reasons



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6. A letter is chosen at random from the letters of the word ASSASSINATION. Find the probability that the chosen is a(i) vowel (ii) consonant.



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7. Two unbiased coins are tossed simultaneously. Find the probability of getting two head (ii) one head one tail (iv) at least one head at most one head (vi) no head



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8. 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



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9. A jar contains 54 marbles each of which is blue, green or white. The probability of selecting a blue marble at random from the jar is  $\frac{1}{3}$ , and the probability of selecting a green marble at random is  $\frac{4}{9}$ . How many white marbles does the jar contain?



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10. Two dice, one blue and one grey, are thrown at the same time. Write down all the

possible outcomes. What is the probability that the sum of the two numbers appearing on the top of the dice is (ii) 13? (iii) less than or equal to 12?



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**11.** 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 square number (iii) a number divisible by 5.



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