

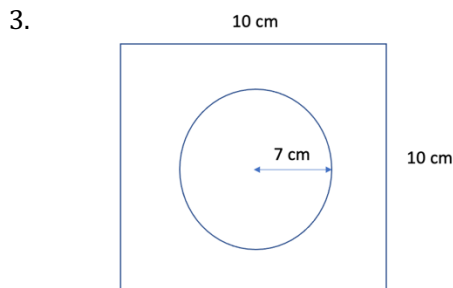
# PROBABILITY

CANSU OLCE

A STAR MATHS ([www.astarmaths.com.au](http://www.astarmaths.com.au))

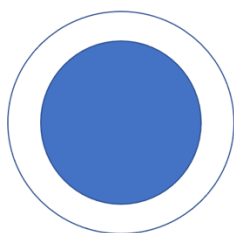
1. There are 42 red marbles and  $x$  blue marbles in a box. A marble is drawn at random from the box. Given that the probability of drawing a blue marble is  $\frac{1}{3}$ , calculate the value of  $x$ .

2. An Art club in a school has 55 members, 20 of whom are females. The club plans to participate in an art competition. Half of the females and  $\frac{1}{5}$  of the males agree to take part. If a member is chosen at random, calculate the probability that he or she is a member who does not want to participate.



The diagram shows a circle with a radius of 7 cm, drawn on a square of side 10 cm. A point is selected at random from the square. Using  $\pi = \frac{22}{7}$ , calculate the probability that the point is outside the circle.

4. The diagram shows two concentric circles such that the radius of the smaller shaded circle is  $\frac{2}{3}$  of the radius of the larger circle. If an arrow is thrown at the circles, calculate the probability that the arrow strike the shaded circle.



5. A bag contains 24 sweets of colours red and yellow. A sweet is drawn at random from the bag. The probability that a red sweet is drawn is  $\frac{5}{8}$ . Calculate the number of yellow sweets that have to be added to the bad so that the probability that a red sweet is drawn now becomes  $\frac{1}{2}$ .
6. A box contains 80 beads of colors red and green. A bead is drawn at random from the box and the probability that it is green is  $\frac{3}{8}$ . Calculate the number of red beads that have to be taken out from the box so that the probability of drawing a green bead now becomes  $\frac{3}{7}$ .
7. A bag contains 36 balls which are red and blue in colour. The probability of drawing a red ball at random from the bag is  $\frac{5}{9}$ . Calculate the number of blue balls to be taken out from the bag so that the probability of drawing a read ball becomes  $\frac{5}{8}$ .
8. A fair die is thrown once. Calculate the probability that the score on the die is either and off number of a prime number.
9. Two fair dice are thrown together. The larger score of the two dice is recorded. If A represents the event that 'the larger score is 3', calculate the probability for the occurrence of event A.

10. Two fair dice, one red and one blue, are thrown together. Calculate the probability that the score on the red die is twice the score on the blue die.

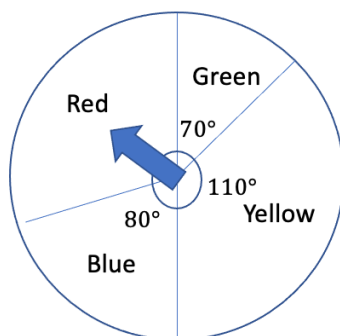
11. The sets  $X$  and  $Y$  are given as follows:

$$X = \{1, 3, 5, 7, 9\}$$

$$Y = \{2, 4, 6\}$$

A number is chosen at random from set  $X$  and another number from set  $Y$ . Calculate the probability that the sum of the numbers is 9 or the product of the numbers is 18.

12. In a game, pointer is rotated about the centre of a coloured disc, as shown in the diagram.



After the pointer has stopped, calculate the probability that it will point at either the yellow sector or the red sector.

13. Box  $X$  contains three cards numbered 1, 2 and 3. Box  $Y$  contains three cards numbered 1, 3 and 4. A card is drawn at random from box  $X$  and at the same time, another card is drawn at random from box  $Y$ . Calculate the probability that the two numbers drawn have the same value or a sum of 3.

14. Box P contains three balls numbered 5, 7 and 9. Box Q contains three cards numbered 4, 6 and 8. A ball is drawn at random from box P and a card is drawn at random from box Q. Calculate the probability that the sum of the number on the ball and the number on the card is either a prime number or a perfect square number.
15. On a rack, there are six red balls, each labelled with letters A, B, C, D, E and F. On the rack, there are also five blue balls, each labelled with letters G, H, I, J and K. If a red ball and blue ball are chosen at random, calculate the probability that a red C ball and a blue I or J or K ball are chosen.
16. Two fair coins are tossed. Calculate the probability that the two coins show the same faces.
17. Noraini has six T-shirts; 2 are blue, 2 are yellow and 2 are red. She also has five skirts; 1 is green, 1 is blue and 3 are yellow. Noraini selects a T-shirt and a skirt at random. Calculate the probability that the T-shirt and skirt selected are of the same colour.
18. A bag contains 5 blue spheres and 7 red spheres. A sphere is drawn at random and then put back into the bag. After that, another sphere is drawn from the bag. After that, another sphere is drawn from the bag. Calculate the probability that at least one blue sphere is drawn.

19. The letters from the word 'INVISIBLE' are written on nine cards. If two cards are chosen at random, one after the other, without replacement, calculate the probability that the first card is an 'I' and the second card is not an 'I'.
20. There are 10 bulbs in a box, 2 of which are spoilt. Two bulbs are drawn at random from the box, one after the other, without replacement. Calculate the probability that two bulbs drawn are both in good condition.
21. A bag has 8 green cubes and 3 red cubes. Two cubes drawn from the bag at random, one after the other, without replacement. Calculate the probability that a green cube and a red cube are drawn.
22. Adnan has 6 green discs and 4 red discs in a bag. He draws two discs from the bag at random, one after the other, without replacement. Calculate the probability that the second disc is red.
23. Azhar, Bala and Chen will be taking a test on traffic rules. The probabilities that Azhar, Bala and Chen will pass the test are  $\frac{2}{3}$ ,  $\frac{3}{4}$ , and  $\frac{4}{5}$  respectively. Calculate the probability that at least one of them passes the test.

24. The probability that three private candidates, A, B and C, will pass the SAT are  $\frac{1}{3}$ ,  $\frac{2}{5}$  and  $\frac{3}{4}$  respectively. Calculate the probability that only two of them will pass.
25. There are two public telephones in front of a bank. The probability that each public telephone is used at any moment is  $\frac{3}{5}$ . Calculate the probability that one of the two telephones is not used.
26. During rainy season, the probability that it will rain on Monday is  $\frac{5}{7}$ . If it rains on Monday, the probability that it will also rain on Tuesday is  $\frac{6}{7}$ . If it does not rain on Monday, the probability that it will rain on Tuesday is  $\frac{4}{7}$ . Calculate the probability that it will rain on Tuesday.
27. In a soccer match between team A and team B, the results can be a draw or a win for team A or a win for team B. The probabilities that team A and team B will win are  $\frac{1}{3}$  and  $\frac{1}{2}$  respectively. In two matches, calculate the probability that team A wins once and draws once.
28. There are 6 red chips, 3 green chips and 4 blue chips in a bag. Two chips are drawn at random from the bag, one after the other, without replacement. Calculate the probability that both chips are of the same color.

29. Bag B consists of four cards labelled with the alphabets E, A, T and S respectively. Bag C consists of five cards labelled with the alphabets S, T, O, R and E respectively. A card is drawn at random from bag B and another card is drawn at random from bag C. Calculate the probability that only one of the two cards shows a vowel.
30. The Mathematics society of a school has 8 male members and 10 female members. If two members are to be chosen at random to represent the society in an inter-club quiz, calculate the probability that they are different genders.
31. Cards written with the letters from the word 'BLESSES' are put into a bag. If two cards are drawn at random, one after the other without replacement, calculate the probability that a letter 'S' and a letter 'E' are drawn.
32. Each of the eight cards labelled with the letters from the word 'TERMINAL' are put into a bag. Two cards are drawn at random from the bag, one after the other, without replacement. Calculate the probability of drawing a vowel and a consonant.



ANSWER KEY

1. 21
2.  $\frac{38}{55}$
3.  $\frac{723}{800}$
4.  $\frac{4}{9}$
5. 6
6. 10
7. 4
8.  $\frac{2}{3}$
9.  $\frac{1}{9}$
10.  $\frac{1}{12}$
11.  $\frac{4}{15}$
12.  $\frac{7}{12}$
13.  $\frac{1}{3}$
14.  $\frac{7}{9}$
15.  $\frac{1}{10}$
16.  $\frac{1}{2}$
17.  $\frac{4}{15}$
18.  $\frac{95}{144}$
19.  $\frac{1}{4}$
20.  $\frac{28}{45}$
21.  $\frac{24}{55}$
22.  $\frac{2}{5}$
23.  $\frac{59}{60}$
24.  $\frac{23}{60}$
25.  $\frac{12}{25}$
26.  $\frac{38}{49}$
27.  $\frac{1}{9}$
28.  $\frac{4}{13}$
29.  $\frac{1}{2}$
30.  $\frac{80}{153}$
31.  $\frac{2}{7}$
32.  $\frac{15}{28}$