9X MCaseStudy – O – Probability

Class 9 Maths CASE STUDY BASED QUESTIONS

QUESTION 1

One day, during games period four friends A, B, C and D planned to play game using number cards. They prepared 20 numbered cards with labelled 1 to 20 and then they put all the number cards in the empty chalk box available in the classroom. In this game, every friend was asked to pick the card randomly and after each draw, card was replaced back in the chalk box.

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20

(i) Find the probability, first boy pick the card and he get the card with an even number?

(a) $\frac{1}{4}$ (b) $\frac{1}{2}$ (c) $\frac{1}{6}$ (d) $\frac{3}{8}$

Number of possible outcomes = 20

Number of favourable outcomes = {2, 4, 6, 8, 10, 12, 14, 16, 18, 20} *i.e.*, 10

$\therefore$ P(even number) $= \frac{10}{20} = \frac{1}{2}$

(ii) If the card drawn in first case is replaced, and the second boy draws a card. What is the probability getting a prime number?

(a) $\frac{2}{5}$ (b) $\frac{4}{5}$ (c) $\frac{7}{8}$ (d) $\frac{9}{11}$

$\therefore$ Number of favourable outcomes = {2, 3, 5, 7, 11, 13, 17, 19} *i.e.*, 8

$\therefore$ P(prime number) $= \frac{8}{20} = \frac{2}{5}$

(iii) If the card drawn, is not replaced in the second draw, what is the probability that he got a multiple of 3 greater than 4?

(a) $\frac{1}{11}$ (b) $\frac{7}{20}$ (c) $\frac{6}{19}$ (d) $\frac{5}{19}$

Number of possible outcomes $= 20 - 1 = 19$

Favourable outcomes $= \{6, 9, 12, 15, 18\}$ *i.e.*, 5

$\therefore$ P(multiple of 3 greater than 4) $= \frac{5}{19}$

(iv) For a sure event A, P(A) = ?

(a) 1 (b) 0 (c) -1 (d) 2

(a) 1

(v) If all cards drawn are replaced then what is the probability of getting a multiple of 3 and 5?

(a) $\frac{1}{2}$ (b) $\frac{1}{5}$ (c) $\frac{1}{20}$ (d) $\frac{1}{18}$

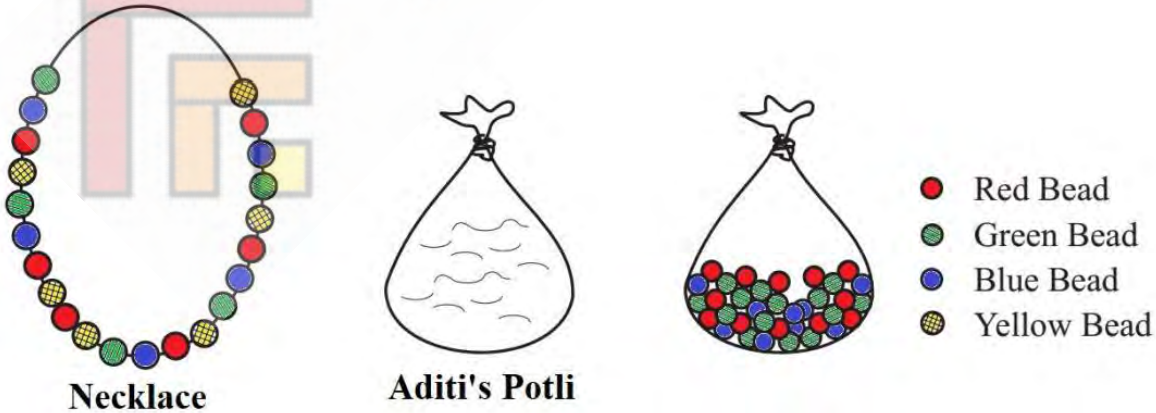
Number of possible outcomes $= 20$

Favourable cases $= \{15\}$ *i.e.*, 1

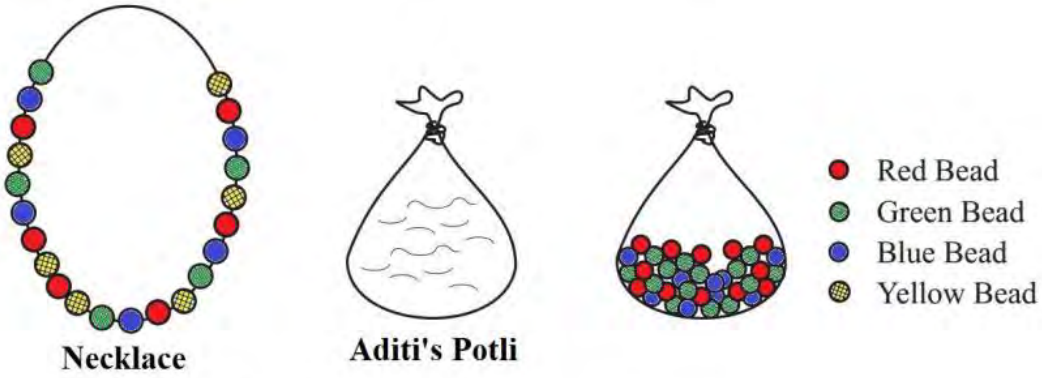
P(multiple of 3 and 5) $= \frac{1}{20}$

QUESTION 2

Aditi runs a handicraft shop in Bapu bazar in Jaipur. She makes beautiful necklaces using colourful beads which she keeps in a potli. Today she prepared 19 necklaces but could not make the 20th necklace as she had no yellow beads left. She counted the beads and found that there were 8 red, 6 green and 14 blue beads remaining in her potli. Her little daughter Dulari requested for a bead. Aditi decides to take out one bead from her potli for Dulari.



Necklace **Aditi's Potli**



(a) Find the probability that she draws a green bead.

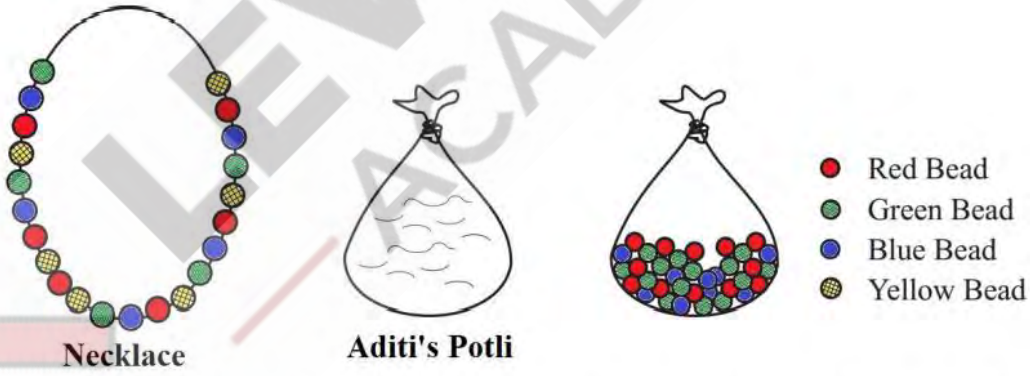
(i) 3/11 (ii) 3/7 (iii) 11/14 (iv) 3/14

Total number of beads in the Potli = 8 + 6 + 14 = 28
Number of green beads in the Potli = 6
Required probability = 6/28 = 3/14

(b) Find the probability that the bead drawn by her is not green.

(i) 3/11 (ii) 3/7 (iii) 11/14 (iv) 3/14

Number of beads not green in the Potli = 28 – 6 = 22
Required probability =22/28 = 11/14



(c) Find the probability that she draws either a green or a blue bead.

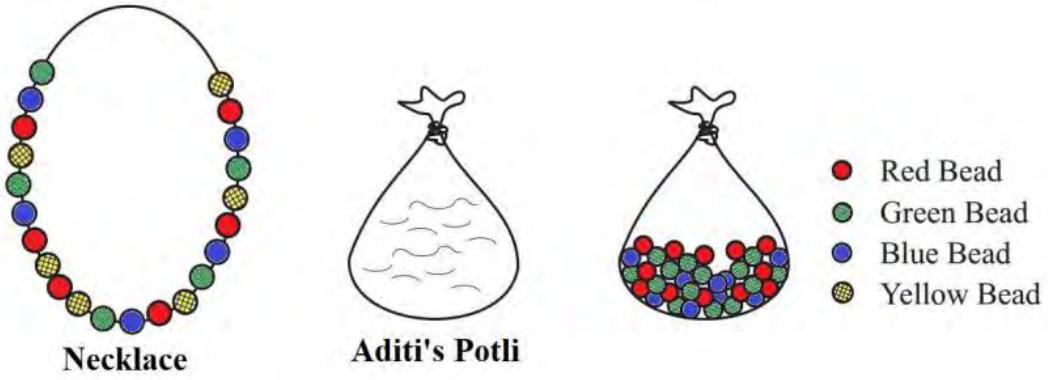
(i) 5/7 (ii) 5/12 (iii) 7/12 (iv) 3/14

Number of blue and green beads in the Potli = 14 + 6 = 20
Required probability = 20/28 = 5/7

(d) Find the probability that she draws neither a red nor a green bead.

(i) 3/14 (ii) 1/3 (iii) 3/7 (iv) 1/2

Number of beads neither green nor red in the Potli =
Number of blue beads in the Potli = 14
Required probability =14/28 = 1/2



Necklace

Aditi's Potli

(e) Which of the following is an impossible event?
(i) The bead drawn is not red
(ii) The bead drawn is neither red nor blue
(iii) The bead drawn is either red or green or blue.
(iv) The bead drawn is yellow.

Ans: (iv) The bead drawn is yellow.

QUESTION 3

One day Rahul visited park along with his friend. There he saw a game of chance that consists of spinning an arrow (as shown in below figure) that comes to rest pointing at one of the numbers 1, 2, 3, 4, 5, 6, 7, 8 and these are equally likely outcomes.

(a) Find the probability that the arrow will point at 2.

(i) $\frac{1}{2}$ (ii) $\frac{1}{8}$ (iii) $\frac{3}{8}$ (iv) $\frac{5}{8}$

Ans: (ii) $\frac{1}{8}$

(b) Find the probability that the arrow will point at an even number.

(i) $\frac{1}{2}$ (ii) $\frac{1}{8}$ (iii) $\frac{3}{8}$ (iv) $\frac{1}{4}$

Ans: (i) $\frac{1}{2}$

(c) Find the probability that the arrow will point at a prime number.

(i) $\frac{1}{2}$ (ii) $\frac{1}{8}$ (iii) $\frac{3}{8}$ (iv) $\frac{5}{8}$

Ans: (i) $\frac{1}{2}$

(d) Find the probability that the arrow will point at a number divisible by 3.

(i) $\frac{1}{2}$ (ii) $\frac{1}{8}$ (iii) $\frac{3}{8}$ (iv) $\frac{1}{4}$

Ans: (iv) $\frac{1}{4}$

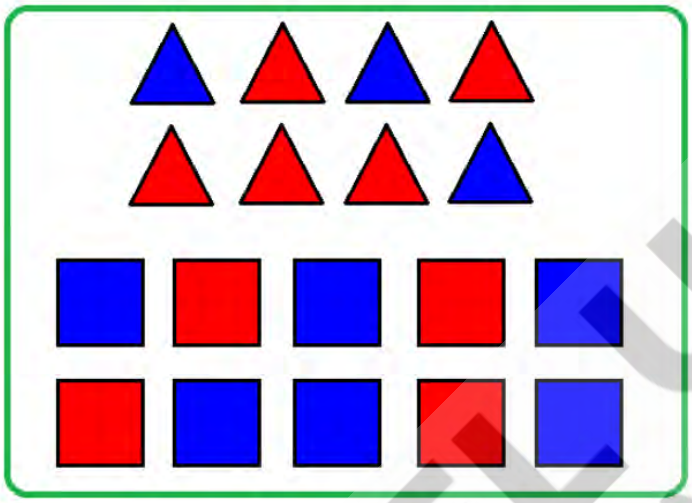
(e) Find the probability that the arrow will point at a number greater than 2.

(i) $\frac{1}{2}$ (ii) $\frac{1}{8}$ (iii) $\frac{3}{4}$ (iv) $\frac{1}{4}$

Ans: (iii) $\frac{3}{4}$

QUESTION 4

Aditya went to shop to purchase a child's game along with his friend. He selected one child's game which has 8 triangles of which 3 are blue and rest are red, and 10 squares of which 6 are blue and rest are red. While checking the game, one piece is lost at random.



(a) How many triangles are of red colour and how many squares are of red colour?

(i) 5, 4 (ii) 4, 5 (iii) 5, 5 (iv) 8, 6

Sol. (i) 5, 4

(b) Find the probability that lost piece is square.

(i) $\frac{4}{9}$ (ii) $\frac{5}{9}$ (iii) $\frac{1}{3}$ (iv) $\frac{5}{18}$

Sol. (ii) $\frac{5}{9}$

(c) Find the probability that lost piece is triangle.

(i) $\frac{4}{9}$ (ii) $\frac{5}{9}$ (iii) $\frac{1}{3}$ (iv) $\frac{5}{18}$

Sol. (i) $\frac{4}{9}$

(d) Find the probability that lost piece is square of blue color.

(i) $\frac{4}{9}$ (ii) $\frac{5}{9}$ (iii) $\frac{1}{3}$ (iv) $\frac{5}{18}$

Sol. (iii) $\frac{1}{3}$

(e) Find the probability that lost piece is triangle of red color.

(i) $\frac{4}{9}$ (ii) $\frac{5}{9}$ (iii) $\frac{1}{3}$ (iv) $\frac{5}{18}$

Sol. (iv) $\frac{5}{18}$

QUESTION 5

Mohan has a box of coloured pens. He takes a pen at random from the box. The probability that she takes a red pen is 0.4. If the box contains total 50 pens of blue, green and red colour and there are 15 blue pens and 15 green pens, then Answer the following questions :

(i) Probability that she does not take red pen is :

(a) $\frac{3}{5}$ (b) $\frac{4}{5}$ (c) $\frac{2}{5}$ (d) $\frac{1}{2}$

$$P(\text{not red}) = 1 - P(R)$$
$$= 1 - 0.4 = 0.6 = \frac{3}{5}$$

(ii) The number of red pens in the box are :

(a) 15 (b) 20 (c) 25 (d) 30

Let number of red pens is x.

$$P(R) = \frac{x}{x+15+15}$$

$$\frac{4}{10} = \frac{x}{x+30}$$ This gives $x = 20$

Blue	15
Green	15
Red	20

(iii) Probability of taking blue pen is :

(a) .6 (b) .5 (c) .4 (d) .3

$$P(B) = \frac{15}{50} = 0.3$$

(iv) Probability of taking green pen is :

(a) .6 (b) .5 (c) .4 (d) .3

$$P(G) = \frac{15}{50} = 0.3$$

Blue	15
Green	15
Red	20

(v) Probability of taking blue or green pen is :

(a) .6 (b) .3 (c) .7 (d) 1

$$P(\text{blue or green pen}) = P(\text{blue}) + P(\text{green})$$
$$= 0.3 + 0.3 = 0.6$$