WS3.2

MATHEMATICS   STANDARD:10

MATHEMATICS OF CHANCE

ANSWERS

1

Possible pairs are

(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)

Total pairs = 36

(a) Pairs with both numbers odd

(1,1) (1,3) (1,5)

(3,1) (3,3) (3,5)

(5,1) (5,3) (5,5)

Total pairs with both number odd = 9

$$\text{Probability} = \frac{\text{Total number of favourable pairs}}{\text{Total pairs}}$$

$$= \frac{9}{36} = \frac{1}{4}$$

(b) Pairs with both numbers are same are

(1,1) (2,2) (3,3) (4,4) (5,5) (6,6)

Total pairs with both numbers are same $=$ 6

$$\text{Probability} = \frac{\text{Total number of favourable pairs}}{\text{Total pairs}}$$

$$= \frac{6}{36} = \frac{1}{6}$$

2 Prime numbers less than 10 are $\underline{2}$, $\underline{3}$, $\underline{5}$, $\underline{7}$

Total prime numbers $=$ 4

Natural numbers up to 5 are 1, 2, 3, 4, 5

Total natural numbers $=$ 5

$\therefore$ Total pairs $= 4 \times 5 = 20$

Pairs with both natural numbers are prime are (2,2) (2,3) (2,5)

(3,2) (3,3) (3,5) (5,2) (5,3) (5,5) (7,2) (7,3) (7,5)

Total favourable pairs $=$ 12

Also favourable pairs $= 4 \times 3$

$$\text{Probability} = \frac{\text{Number of favourable pairs}}{\text{Total pairs}}$$

$$= \frac{12}{20} = \frac{3}{5}$$

(b) Pairs with both numbers are even are (2,2) (2,4)

Number of favourable pairs $=$ 2

$$\text{Probability} = \frac{2}{20} = \frac{1}{10}$$

3.

(a)   Total number of students in first class = 35

Number of boys = 20

Number of girls = 15

Total number of students in second class = 30

Number of boys = 15

Number of girls = 15

Total pairs of students = $35 \times 30 = 1050$

(b) Number of pairs in which both are boys = $20 \times 15 = 300$

Probability of both being boys $= \frac{300}{1050} = \frac{2}{7}$

(c) Number of pairs in which both are girls = $15 \times 15 = 225$

Probability of both being girls $= \frac{225}{1050} = \frac{3}{14}$

(d) Number of pairs in which one is a boy

and the other a girl = $20 \times 15 + 15 \times 15 = 300 + 225$

$= 525$

Probability of one being boy and the other a girl $= \frac{525}{1050} = \frac{1}{2}$

4   Total number ways of taking a pair of mangoes

from each basket = $70 \times 50 = 3500$ ways

(a)   Number of ripe mangoes in first basket = $70 - 40 = 30$

Number of ripe mangoes in second basket = $50 - 20 = 30$

Total pairs of ripe mangoes from each basket $= 30 \times 30 = 900$

Probability of getting both being ripe $= \dfrac{\text{Total pairs of ripe mangoes}}{\text{Total pairs of mangoes}}$

$$= \dfrac{900}{3500} = \dfrac{9}{35}$$

(b) Number of unripe mangoes from first basket $= 40$

Number of unripe mangoes from second basket $= 20$

Total pairs of unripe mangoes from each basket $= 40 \times 20 = 800$

Probability of getting both being unripe $= \dfrac{\text{Total pairs of unripe mangoes}}{\text{Total pairs of mangoes}}$

$$= \dfrac{800}{3500} = \dfrac{8}{35}$$

(c) At least one ripe means (i) first one ripe and other unripe (ii) both ripe (iii) first one unripe and other ripe.

$\therefore$ Total pairs of

at least one ripe mango $= (30 \times 20) + (30 \times 30) + (40 \times 30)$

$$= 600 + 900 + 1200 = 2700$$

Probability of getting at least one ripe mango

$$= \dfrac{\text{Total pairs of at least one ripe mango}}{\text{Total pairs of mangoes}}$$

$$= \dfrac{2700}{3500} = \dfrac{27}{35}$$