Course5 - Sprint 3 - Challange

Task:-1

Total members in a Society = 12 members
Committee members = 5 members
The owner of the Society, is already Member of the Committee.

Combination = $^{11}C_4$

Here $n=1, r=4$

$$nCr = \frac{n!}{r!(n-r)!}$$

$$= \frac{11!}{4!(11-4)!}$$

$$= \frac{11\times10\times9\times8\times7\times6\times5\times4\times3\times2\times1}{4\times3\times2\times1\,(7\times6\times5\times4\times3\times2\times1)}$$

$$= 11\times10\times3$$

$$= 330$$

'330' the Committee can be formed

Task:2

At a car parking:-
There are total = 150 Vehicles
There are total = 80 Cars
There are total = 50 Vans

a) Van leaving first = $\frac{50}{150} = \frac{1}{3}$

b) a lorry leaving first = $\frac{150-80-50}{150}$

$= \frac{20}{150} = \frac{2}{15}$

c) a car leaving second if either a lorry or a Van had left first.

Total = 150

anyone of the vehicle is left = 149

So, the probability of a car leaving second is :- $\frac{80}{149} = 0.53691$

Task :- 3

A survey was taken on 30 classes at a school.

no. of left-handed std	0	1	2	3	4	5
Frequency (no of classes)	1	2	8	5	12	2

a) The probability that the class has 2-left-handed students = $\frac{4}{\frac{30}{15}} = \frac{4}{15}$

b) The probability that the class has at least 3 left-handed students :-

(i) $\frac{5}{30}\frac{1}{6} = \frac{1}{6}$, (ii) $\frac{12}{30}\frac{42}{105} = \frac{2}{5}/2$

(iii) $\frac{21}{\frac{30}{15}} = \frac{1}{15}$

Task :-4

Area of triangle ABR $= \frac{1}{2} \times$ base $\times$ height

Base $=$ AB $= x$

Similarly $=$ PB $= x$

$\therefore$ Area of triangle ABR $= \frac{1}{2} \times x \times x$

$= \frac{1}{2} x^2$

Area of Square PQRS $=$ side $\times$ side

$= S^2$

$\because S = 2x$

$= S^2 = 4x^2$.

Probability $=$ $\frac{\text{Area of triangle ABR}}{\text{Area of Square PQRS}}$

$= \frac{\frac{1}{2} \times x \times x}{4x^2} = \frac{1}{2} \times x^2 = \frac{x^2}{2}$

$= \frac{\frac{x^2}{2}}{4x^2} = \frac{\frac{1}{2}}{\frac{4}{1}} = \frac{1}{8}$.

Task :-5

When two dice are rolled = $6 \times 6 = 36$

1) Equal to 1 = (1,1)

probability = No. of outcomes that given a sum of 1 / Total No. of outcomes

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

2) Equal to 4 = (1,3), (2,2) and (3,1)

probability = No. of outcomes that given a sum of 4 / Total No. of outcomes

probability = $\frac{3}{36} = \frac{1}{12}$

3) ~~Equal to 13~~ =

Less than 13 =

There are two outcomes :- 11 and 12

11 = (6,5), (5,6) and (4,7)

12 = (6,6) and (5,7)

Task: - 6

There are total ticket = 20 (1 to 20) Num

a) Even numbers :- 2, 4, 6, 8, 10, 12, 14, 16, 18, 20

probability = $\frac{\text{No. of Even Numbers}}{\text{Total No. of Number}}$

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

b) Number divisible by 3 :-

3, 6, 9, 12, 15, 18, 21, 24, 27, 30

probability = $\frac{\text{No. of divisible by 3}}{\text{Total No. of Number}}$

$= \frac{165}{3} = 55$

c) prime Number :- 2, 3, 5, 7, 11, 13, 17, 19

probability = $\frac{\text{No. of prime No's}}{\text{Total No. of Number}}$

$= \frac{8\,42}{20} = \frac{2}{5}$

d) Number of divisible by 5 :-

5, 10, 15, 20, 25, 30, 35, 40, 45, 50

Probability = $\frac{\text{No. of divisible by 5}}{\text{Total No. of Numbers}}$

$= \frac{\cancel{275}}{\cancel{5}1}$ 55

Task :- 7

Henry is playing with dice = 3

Sum = 11 or 12

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

Number of favorable :- 27

Total possible = 6×6×6 = 216

∴ probability of getting sum 11 when 3 dices are rolled = 27/216

$= \frac{1}{8}$

Sum = 12

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

(1,5,6) which can be permuted in [3!] = 6 ways.

(2,4,6) → [3!] = 6 ways

(4,4,4) → (3!) = 6 ways

$(5,5,2) \rightarrow (3!/2!) \rightarrow \frac{3\times 2}{2\times 1}$ 3 ways.

$(6,3,3)) \rightarrow (3!/2!) \rightarrow$ 3 ways.

Total outcomes :- 25

∴ Hence the required probability $= \frac{25}{216}$

$= 0.115740$