THIRUVANANTHAPURAM EDUCATIONAL DISTRICT

WS 3.1

MATHEMATICS STANDARD:10

MATHEMATICS OF CHANCE (ANSWERS)

1. A box contains 10 black and 5 white balls. If a ball is taken from it what is the probability of it being black? And what is the probability of it being white?

Total number of balls in the box = 15

Total number of **black** balls in the box = 10

Probability of getting a **black** ball = $\frac{number\ of\ black\ balls}{total\ number\ of\ balls}$

= $\frac{10}{15}$ = $\frac{2}{3}$

Total number of **white** balls in the box = 5

Probability of getting a **white** ball = $\frac{number\ of\ white\ balls}{total\ number\ of\ balls}$

= $\frac{5}{15}$ = $\frac{1}{3}$

2. Numbers from 1 to 30 are written in paper slips and put in a box. With out looking one slip is taken from it.
a) What is the probability that it is an even number?
b) What is the probability that it is a prime number?

a) Total number of paper slips = 30

Even numbers from 1 to 30 are 2, 4, 6,...30

Total Number of even numbers from 1 to 30 = 15

Probability of getting an even number= $\frac{Total\ Number\ of\ even\ numbers}{Total\ Number\ of\ paper\ slips}$

= $\frac{15}{30}$ = $\frac{1}{2}$

b) The prime numbers between 1 to 30 are 2, 3, 5, 7, 11, 13, 17, 19, 23 and 29.

Total Number of prime numbers = 10

Probability of getting a prime number = $\frac{Total\ Number\ of\ prime\ numbers}{Total\ Number\ of\ paper\ slips}$

= $\frac{10}{30}$ = $\frac{1}{3}$

3. There are 18 beads in a box. Some of them are white and the remaining are black. The probability of drawing a black bead from it is $\frac{1}{3}$ Then (a) How many black beads are there in the box ?
(b) How many white beads are there in the box ?

(a) Total number of beads = 18

Probability of getting black bead = $\frac{1}{3}$

Probability of getting black bead = $\frac{Number\ of\ black\ beads}{Total\ number\ of\ beads}$

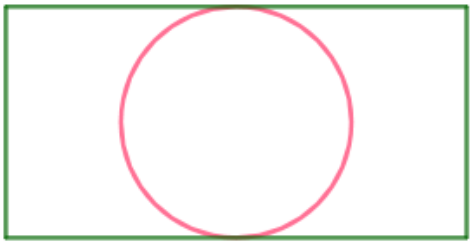
$\frac{1}{3}$ = $\frac{Number\ of\ black\ beads}{18}$

3 x Number of black beads = 18

Number of black beads = $\frac{18}{3}$ = 6

(b) Number of white beads = 18 –6 = 12

4. In the figure below the length and breadth of the rectangle is 10 cm and 8 cm respectively. If we put a dot inside the rectangle without looking into it, what is the probability that it will be inside the circle?



Length of rectangle = 10

Breadth of rectangle = 8

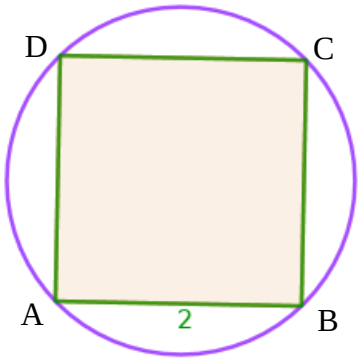
Area of rectangle = 10 x 8 = 80

Radius of the circle = $\frac{8}{2}$ = 4

Area of the circle = πr^2 = π X 4^2 = 16 π

Probability = $\frac{area\ of\ circle}{area\ of\ rectangle}$ = $\frac{16\ \pi}{80}$ = $\frac{\pi}{5}$

5. In the figure, what is the probability of a dot we put without looking to be with in the square?



Length of one side of square = 2

Area of the square = 4

AB = BC = 2

AC = $\sqrt{AB^2 + BC^2}$ = $\sqrt{2^2 + 2^2}$ = $\sqrt{4+4}$ = $\sqrt{8}$

Radius of circle = $\frac{AC}{2}$ = $\frac{\sqrt{8}}{2}$ = $\frac{2\sqrt{2}}{2} = \sqrt{2}$

Area of circle = πr^2 = π $(\sqrt{2})^2$ = 2π

Probability of dot with in the square = $\frac{area\ of\ square}{area\ of\ circle}$ = $\frac{4}{2\pi}$ = $\frac{2}{\pi}$