MATHEMATICS - STANDARD 10

40(II)

WORKSHEET FOR 6th OCTOBER 2020

A JOINT VENTURE OF DIET PALAKKAD AND SSK PALAKKAD

INTER BELL
INTERVENTION BASED ON EFFECTIVE LEISURE LEARNING

STUDENT SUPPORT MATERIAL for X Mathematics

Mathematics of Chances

We come across a lot of unpredictable events in our life. For example, will it rain or not, will your team win in this match or not, will your favourite player score a goal in this game or not, will they get the toss or not and so on.

A coin has two faces: one Head and one Tail. If we toss a coin, we get any one of these. Can we predict the outcome before tossing? Of the two faces, both of them have equal chances of occurrence and it is one out of two that is 1/2.
$P(H) = 1/2$, $P(T) = 1/2$.

Yes, there lies the mathematics of chances.
Not only that, $P(H) + P(T) = 1/2 + 1/2 = 1$
When we play with a dice, we get the following:
$P(1) + P(2) + P(3) + P(4) + P(5) + P(6) = 6 \times 1/6 = 1$
Will it be like this always? Consider the case of selecting a slip from a box containing slips numbered from 1 to 5. The probability of getting an odd number from it is 3/5. The probability of getting a prime number from it is also 3/5. If you add these two probabilities, will you get 1? What happened here? What will be the reason? Let us think, it's crazy.

Apart from this, we have some more interesting facts about probability.

Why do we need a chapter called "Mathematics of chance?"

Ans: To measure the chances of happening and to denote it numerically.

We usually express the chance of an event in percentage form, not as a number in between zero and one. So this chapter gives us a different experience.

Example: The probability to get head while tossing a coin is 1/2. But will we get a head in every two tossing? Have you seen the tossing of a coin by Amitab Bachan in the film 'SHOLEY'? Both the sides of the coin are heads!

A coin for tossing is selected only after confirming its unbiasedness by making a number of tosses.

Actually the concept of probability arises in situations where the prediction is difficult. The materials and situations must be unbiased. Sometimes the factors influencing this prediction will also have to be considered. In a match, the number of expert players in a team, their performances in the previous matches, the current weather conditions etc. are few examples for this.

Probability loses its role in certain instances. For example, what is the probability that it will rain today? It depends on the strength of wind, humidity, presence of clouds, its density etc. In this case, we won't get an accurate result by using the probability theory. But now we have technical instruments for this.

Probability has an important role even in the medical field. These days we hear a lot about the number of positive and negative corona cases. Probability has a great role in determining the next steps and strategies in their future treatment.

In conclusion, we should remember that, there may be unpredictable situations in our life, but we should not have uncertainties while facing them.

Probability: Self assessment questions

Do it yourself ...

MATHEMATICS - STANDARD 10

WORKSHEET FOR 6th OCTOBER 2020

40(II)

Questions:

1) In a class there are 5 girls and 4 boys. They shook hands with each other. If we take photo of each, how many photos will be there? If we select a photo from these at random, what is the probability that it will be among,

a) Both Girls
b) Both Boys
c) One Boy and one Girl
d) At least one Boy.

2) What is the probability that there will be 5 Wednesdays in the month of March?

3) All four digit numbers are written in separate paper slips and put into a box. If we took a slip randomly (without looking) from it, what is the probability that the product of the digits will be a prime number?

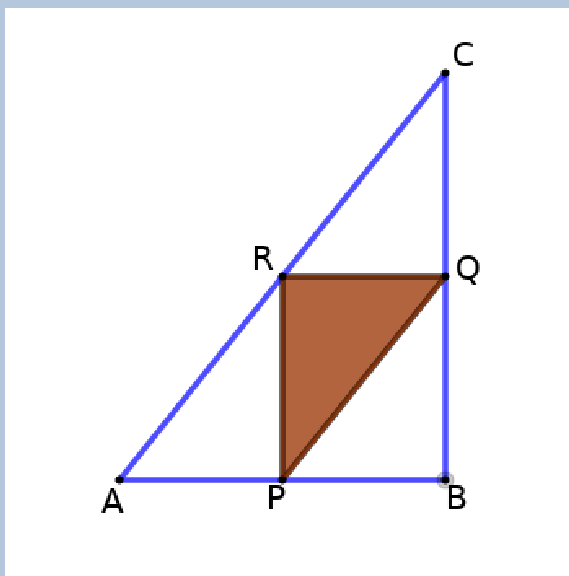
4) What is the probability of getting 53 Sundays in a leap year?

5) The two-digit numbers are written on separate pieces of paper and placed in a box. If you take a piece of paper without looking, that is randomly

a) What is the probability that each digit of those numbers in it are equal?

b) What is the probability that the product of the digits of each number is a perfect square?

6) P, Q and R are the midpoints of the sides of the right triangle ABC in the figure. If a dot is marked without looking at it, (randomly) what is the probability that the point falls in triangle PQR?



MATHEMATICS - STANDARD 10

WORKSHEET FOR 6th OCTOBER 2020

40(II)

7) The number of children in Division 10A in a school is equal to the number of children in Division 10B. One child should be selected from each division. There are 20 boys in 10A. The probability of selecting a boy from 10A is 2/5. The probability of selecting a boy from 10B is 3/5.

a) How many children are there in 10A in total?

b) What is the probability that the child selected from 10A will become a girl?

c) How many boys are there in 10B?

d) What is the probability that both the selected children will become boys?

CHECK YOUR ANSWERS...

MATHEMATICS - STANDARD 10 **40 (I)**

WORKSHEET FOR 6th October 2020

A JOINT VENTURE OF DIET PALAKKAD AND SSK PALAKKAD

INTER BELL
INTERVENTION BASED ON EFFECTIVE LEISURE LEARNING

STUDENT SUPPORT MATERIAL for X Mathematics

Julius Wilhelm Richard Dedekind

Born on 6th October 1831

He is known for making important contributions to abstract algebra (particularly ring theory), algebraic number t.

KITE VICTERS STD 10 **Mathematics - Class - 40**	

Try this....

1) A two digit number is chosen from the group of all the two digit numbers formed with either digit 1, 2 or 3. Then, find the probability of

i) Getting the sum of the digits odd.
ii) Getting the product of the digits even.

Two digit numbers	sum	product
11	2	1
12	3	2
13	4	3
21	3	2
22	4	4
23	5	6
31	4	3
32	5	6
33	6	9

The number of two digit numbers which can be formed with either digit 1, 2 or 3 = 9

i) The number of two digit numbers where the sum of digits is odd = 4

12 21 23 32

Probability of getting the sum of digits odd

$$= \frac{\text{No of two digit numbers whose sum of digits is odd}}{\text{No of two digit numbers formed either with 1, 2, or 3}}$$

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

ii) The number of two digit numbers where the product of digits is even = 5

12 21 22 23 32

Probability of getting the product of digits even

$$= \frac{\text{No of two digit numbers whose product of digits is even}}{\text{No of two digit numbers formed either with 1, 2, or 3}}$$

$$= \frac{5}{9}$$

2. A game for two players. Each player has to decide whether he wants odd or even number in the beginning. Then both raises some fingers of one hand. If the sum is odd, the one who had chosen the same wins, and if it is even, the other wins. In this game, what is the better choice in the beginning, odd or even?

	1	2	3	4	5
1	2	3	4	5	6
2	3	4	5	6	7
3	4	5	6	7	8
4	5	6	7	8	9
5	6	7	8	9	10

Total number of pairs = 25

No of pairs whose sum is odd = 12

$$\text{Probability that the sum is odd} = \frac{\text{No of pairs whose sum is odd}}{\text{Total number of pairs}} = \frac{12}{25}$$

No of pairs whose sum is even = 13

$$\text{Probability that the sum is even} = \frac{\text{No of pairs whose sum is even}}{\text{Total number of pairs}} = \frac{13}{25}$$

As the probability of getting a sum even is more than the probability of getting a sum odd, the better choice is even.

3. There are 15 boys and 20 girls in 10 A and 25 boys and 15 girls in 10 B. One student is selected at random from each class. Then find the probability of selecting

i) Two boys.
ii) Two girls.
iii) One boy and one girl.
iv) At least one boy.

	10 A	10 B
Boys	15	25
Girls	20	15
Total	35	40

	10 A Boys 15	10 A Girls 20	Total 35
10 B Boys 25	375	500	875
10 B Girls 15	225	300	525
Total 40	600	800	1400

Total No. of pairs $= 35 \times 40 = 1400$

i) No. of pairs in which both are boys $= 15 \times 25 = 375$

Probability of selecting two boys

$$= \frac{\text{Pairs in which both are boys}}{\text{Total number of pairs}} = \frac{375}{1400} = \frac{15}{56}$$

ii) No. of pairs in which both are girls $= 20 \times 15 = 300$

$$\text{Probability of selecting two girls} = \frac{\text{Pairs in which both are girls}}{\text{Total number of pairs}} = \frac{300}{1400} = \frac{3}{14}$$

iii) No. of pairs with one boy and one girl

= Pairs with a boy from 10 A and a girl from 10B + Pairs with a girl from 10 A and a boy from 10B

$= 15 \times 15 + 20 \times 25 = 225 + 500 = 725$

(Another method: Total number of pairs – (No. of pairs with two boys + No. of pairs with two girls)

$= 1400 - (375 + 300) = 1400 - 675 = 725$)

$$\text{Probability of selecting one boy and one girl} = \frac{\text{No. of pairs with one boy and one girl}}{\text{Total number of pairs}} = \frac{725}{1400} = \frac{29}{56}$$

iv) No. of pairs with at least one boy

= No. of pairs with only one boy + No. of pairs with two boys $= 725 + 375 = 1100$

(Another method: Total number of pairs – No. of pairs with two girls $= 1400 - 300 = 1100$)

$$\text{Probability of selecting at least one boy} = \frac{\text{No. of pairs with at least one boy}}{\text{Total number of pairs}} = \frac{1100}{1400} = \frac{11}{14}$$

v) Similarly, you can find the probability of selecting at least one girl.

WORKSHEET FOR 6th October 2020

4. Two dice with faces numbered from 1 to 6 are rolled together.
i) What are the possible sums?
ii) Which of these sums has the maximum probability?
iii) What is that probability?

	1	2	3	4	5	6
1	2	3	4	5	6	7
2	3	4	5	6	7	8
3	4	5	6	7	8	9
4	5	6	7	8	9	10
5	6	7	8	9	10	11
6	7	8	9	10	11	12

The possible sums are 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 and 12.

From the tables shown, it is clear that the sum 7 occurs more number of times than the other sums.
Hence, the sum 7 has the maximum probability.

Sum	Frequency
2	1
3	2
4	3
5	4
6	5
7	6
8	5
9	4
10	3
11	2
12	1

When two dice are rolled together,
the possible number of outcomes =36
Number of favourable outcomes for the sum 7 = 6

Probability of getting the sum 7

$$= \frac{\text{Number of favourable outcomes}}{\text{Possible number of outcomes}} = \frac{6}{36} = \frac{1}{6}$$

Questions:

1. A box contains ten slips numbered from 1 to 10 and another contains five slips numbered from 1 to 5. If one slip each is taken at random from both the boxes, what is the probability that

i) Both the numbers are odd?

ii) Both the numbers are even?

iii) One is odd and the other is even?

2. *There are 16 mangoes in a basket out of which 6 are raw. Another basket contains 35 mangoes in which 13 are raw. On the next day, 3 more mangoes of the first box and 7 more mangoes of the second box became ripe.*

   i) *If one mango is taken at random from the first box on the first day, what is the probability of getting a ripe mango?*

   ii) *If one mango each is taken at random from both the boxes on the first day, what is the probability that both are unripe.*

   iii) *If one mango is taken at random from the second box on the second day, what is the probability of getting an unripe mango?*

   iv) *If one mango each is taken at random from both the boxes on the second day, find the probability of getting one ripe and other unripe.*

WORKSHEET FOR 5th October 2020

A JOINT VENTURE OF DIET PALAKKAD AND SSK PALAKKAD

INTER BELL
INTERVENTION BASED ON EFFECTIVE LEISURE LEARNING

STUDENT SUPPORT MATERIAL for X Mathematics

Bernard Bolzano

Born on 5th October 1781.

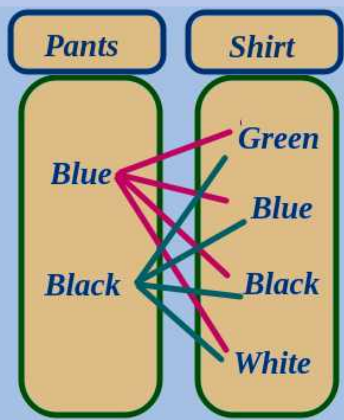
Bernard Bolzano was a Bohemian mathematician, logician, philosopher, theologian and Catholic priest of Italian extraction, also known for his liberal views.

KITE VICTERS STD 10 **Mathematics - Class - 39**	

WORKSHEET FOR 5^{th} October 2020

Try this....

1. *Johny has two pants coloured blue and black and four shirts, green, blue, black and white.*
   i) In how many ways can he wear pants and shirts?
   What is the probability that both the pants and shirt will be of
   ii) same colour? iii) different colour?



No of ways in which he can wear pants and shirts
= Total number of pairs $= 2 \times 4 = 8$

Pairs

(Blue, Green)
(Blue, Blue)
(Blue, Black)
(Blue, White)
(Black, Green)
(Black, Blue)
(Black, Black)
(Black, White)

i) No of pairs in which both pants and shirt are of same colour $= 2$

(Blue, Blue) (Black, Black)

Probability that both are of same colour $= \dfrac{\text{Pairs with same colour}}{\text{Total number of pairs}}$

$$= \frac{2}{8} = \frac{1}{4}$$

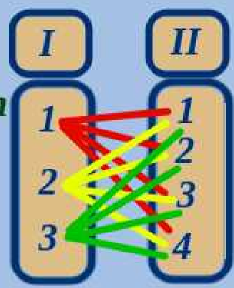
ii) No of pairs in which both pants and shirt are of different colours = 6

(Blue, Green), (Blue, Black), (Blue White), (Black, Green), (Black, Blue), (Black White)

Probability that both are of different colours $= \dfrac{\text{Pairs with different colours}}{\text{Total number of pairs}}$

$$= \frac{6}{8} = \frac{3}{4}$$

2. A box contains three slips numbered 1, 2 and 3 and another contains four slips numbered 1, 2, 3, and 4. If one slip is taken at random from each, find the probability of getting both
i) odd.
ii) prime.



Pairs
(1, 1)
(1, 2)
(1, 3)
(1, 4)
(2, 1)
(2, 2)
(2, 3)
(2, 4)
(3, 1)
(3, 2)
(3, 3)
(3, 4)

Total number of pairs $= 3 \times 4 = 12$

i) No of pairs in which both are odd = 4 (1, 1) (1, 3) (3, 1) (3, 3)

$$\text{Probability of getting both odd} = \frac{\text{No of pairs in which both are odd}}{\text{Total number of pairs}}$$

$$= \frac{4}{12} = \frac{1}{3}$$

ii) No of pairs in which both are prime = 4 (2, 2) (2, 3) (3, 2) (3, 3)

$$\text{Probability of getting both prime} = \frac{\text{No of pairs in which both are prime}}{\text{Total number of pairs}}$$

$$= \frac{4}{12} = \frac{1}{3}$$

Questions **:**

1. Sunitha has two necklaces, one with blue and the other with green stones and three pairs of earrings of green, red and blue stones.

i) In how many ways can she wear them?

What is the probability that both the necklace and earrings are of stones with

ii) Same colour? iii) Different colour?

WORKSHEET FOR 5th October 2020

2. *A box contains four slips numbered 1, 2, 3 and 4 and another contains three slips numbered 5, 6 and 7. If one slip is taken at random from both the boxes, what is the probability that*

   i) Both the numbers are odd ?

   ii) Both the numbers are even ?

   iii) The sum of the numbers is odd?

   iv) The product of the numbers is even?

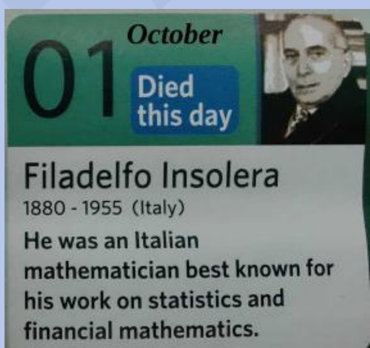
MATHEMATICS - STANDARD 10 **38**

WORKSHEET FOR 1st October SEPTEMBER 2020

A JOINT VENTURE OF DIET PALAKKAD AND SSK PALAKKAD

INTER BELL
INTERVENTION BASED ON EFFECTIVE LEISURE LEARNING

STUDENT SUPPORT MATERIAL for X Mathematics

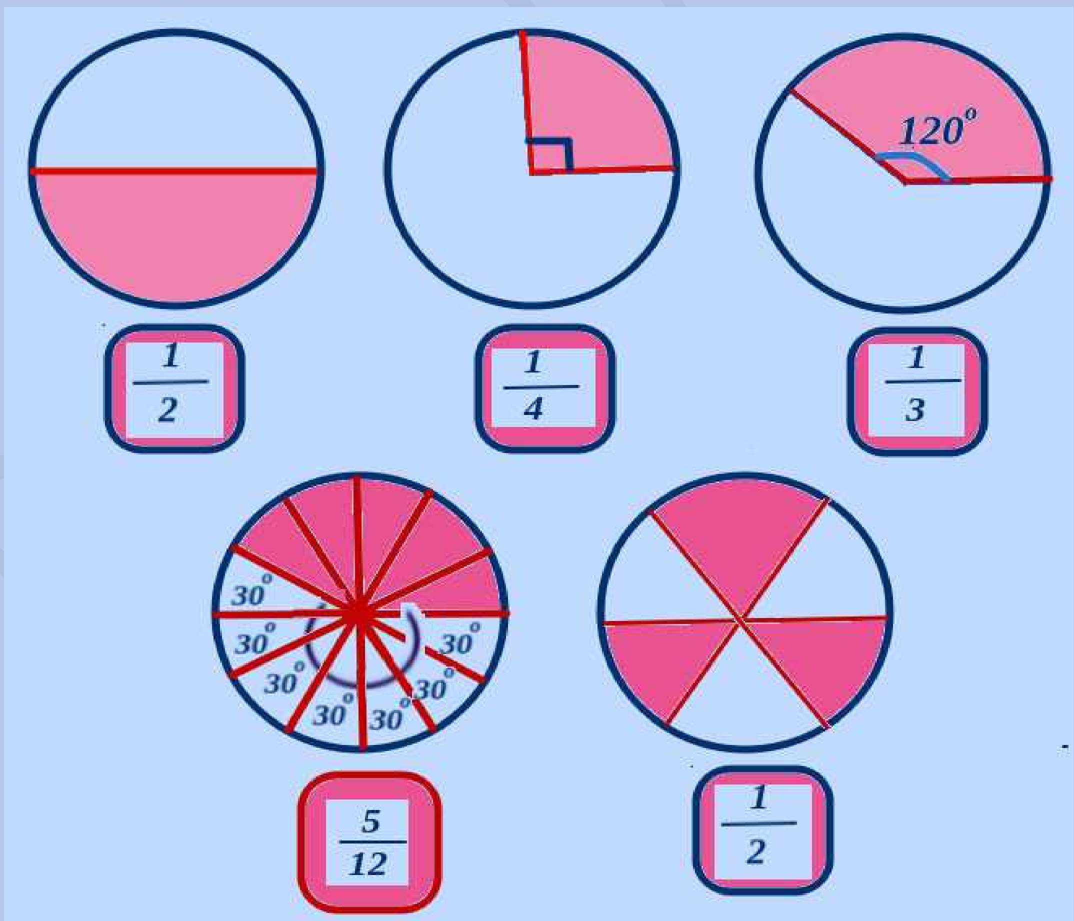


KITE VICTERS STD 10 **Mathematics - Class - 38**	

WORKSHEET FOR 1st October SEPTEMBER 2020

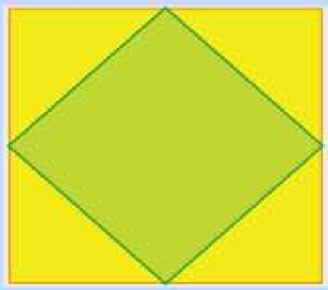
Try this....

Have you seen multicoloured disc spins on a board?
We have to learn the situations when the Probability is interpreted geometrically. We can see the examples given below.
If we put a dot in the figure with out looking, what is the probability that it is inside the shaded region?
For that we have to find how much part is the area of the shaded region to that of total area.

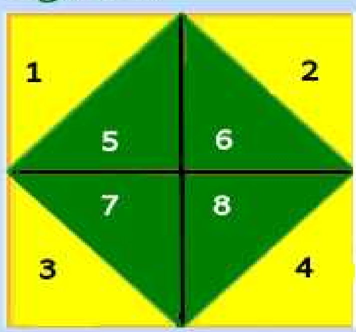


In each picture below, the explantion of the green part is given. Calculate in each, the probability of putting a dot, without looking, to be within the green part.

1. A square got by joining the mid points of a bigger square.



If we join the diagonals of green square, we get 8 equal triangles. That is the green square is the half of outer square.



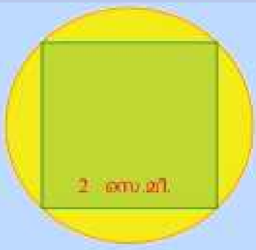
∴ Probability of the dot to be within the green square

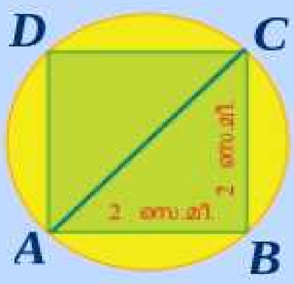
$$= \frac{\text{Number of equal triangles in the green square}}{\text{Total number of equal triangles}}$$

$$= \frac{4}{8}$$

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

2. A square with all the vertices on a circle.





Draw the diagonal AC of the square.
AC is again the diameter of the circle.

Diagonal AC $= 2\sqrt{2}$

(Pythagoras theorem / Angles are 45^o, 45^o and 90^o)

$\therefore$ Radius $= \dfrac{2\sqrt{2}}{2} = \sqrt{2}$

Area of circle $= \pi r^2 = \pi \times \sqrt{2} \times \sqrt{2}$

$= \pi \times 2 = 2\pi \ cm^2$

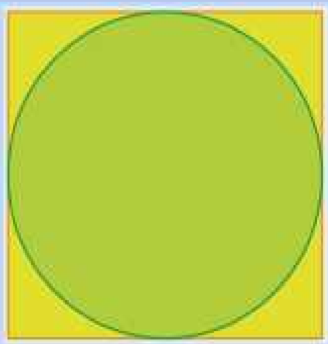
Area of square $= 2 \times 2 = 4 \ cm^2$

$\therefore$ Probability of the dot to be within the square

$= \dfrac{\text{Area of square}}{\text{Area of circle}}$

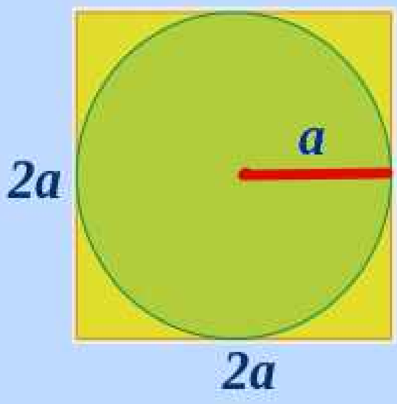
$= \dfrac{4}{2\pi} = \dfrac{2}{\pi}$

3. Circle exactly fitting inside a square.



Let, the length of the side of the square be 2a.

Then the radius of the circle = a



Area of the square $= 2a \times 2a = 4a^2$

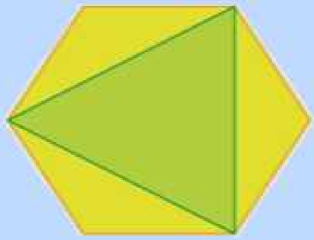
Area of the circle $= \pi r^2 = \pi a^2$

$\therefore$ *Probability of the dot to be with in the circle*

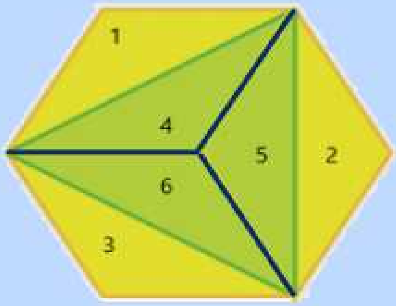
$$= \frac{\text{Area of the circle}}{\text{Area of the square}}$$

$$= \frac{\pi a^2}{4a^2} = \frac{\pi}{4}$$

4. *A triangle obtained by joining the alternate vertices of a regular hexagon.*



If we draw the angular bisectors of the green triangle, we get 6 equal triangles. That is the green triangle is half of regular hexagon.



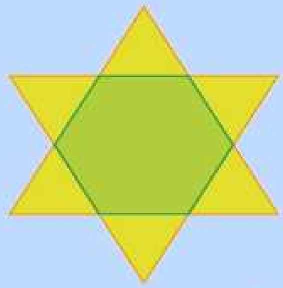
$\therefore$ *Probability of the dot to be within the green triangle*

$$= \frac{\text{Number of equal triangles in the green triangle}}{\text{Number of equal triangles in the hexagon}}$$

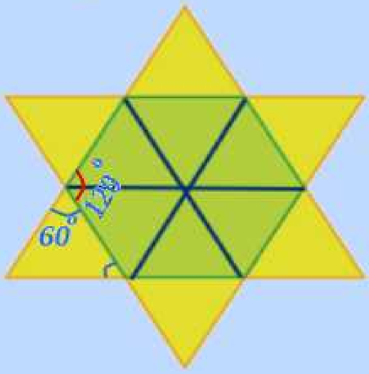
$$= \frac{3}{6}$$

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

5. *A regular hexagon formed by two overlapping equilateral triangles.*



If we draw the diagonals of the regular hexagon, we get 12 equal triangles.



We know that the inner and outer angles at each vertex of the regular hexagon are 120° and 60° respectively. That is, all the inner angles of each yellow triangle is 60°. That is all the triangles are equilateral.

$\therefore$ *The probability of the dot to be within the regular hexagon*

$$= \frac{\text{Number of equal triangles in the regular hexagon}}{\text{Total number of equal triangles}}$$

$$= \frac{6}{12} = \frac{1}{2}$$

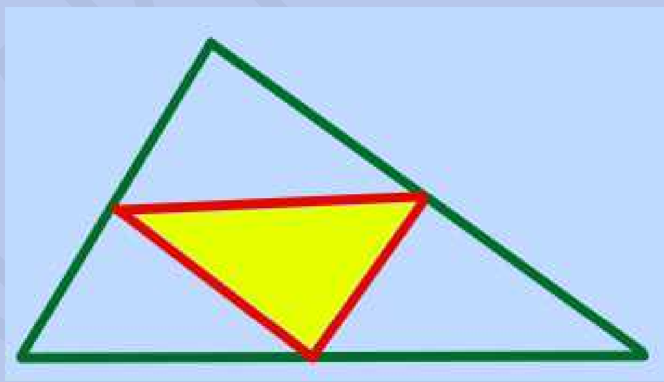
Questions:

1. **Each of the letters of the word MALAYALAM is written on seperate paper slips and put in a box. If a person takes a paper slip from the box without looking into the box, what is the probability that**

   a) It is the letter "A"

   b) It is not the letter "A"

2. **In the figure the shaded triangle is drawn by joining the midpoints of the sides of the large triangle. Calculate the probability of putting a dot, without looking, on larger triangle to be inside the shaded triangle.**



3. **Separate cards numbered as 10, 11, 12 ,13,14, 15, 16, 17 and 18 are made. One is asked to take a card from this. What is the probability that**

   a) It is an even number?

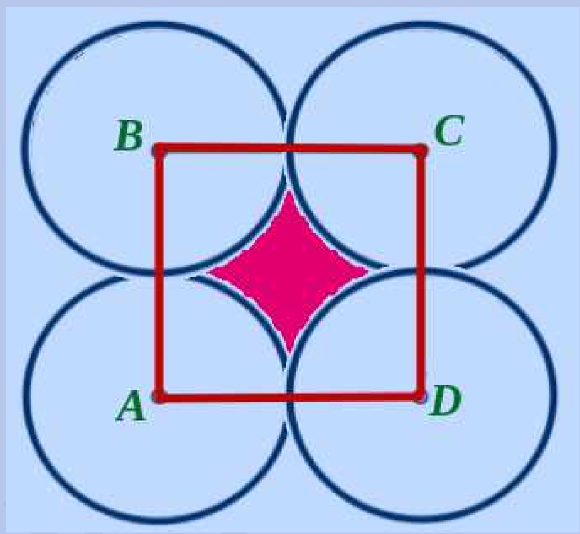
   b) It is a prime number?

4. In figure, A, B,C and D are the centres of each circle. The radius of each is 1 unit.

a) What is the length of the side of the square ABCD?

b) What is the area of the square ABCD?

c) What is the area of the shaded region?



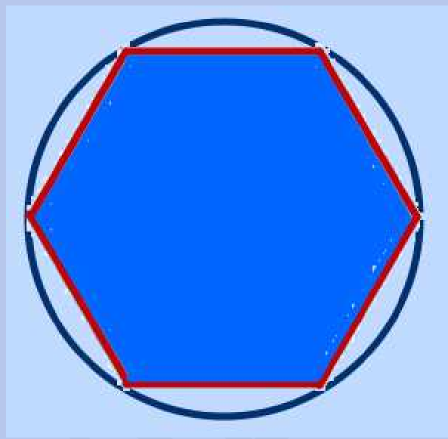
d) If a dot is put at random inside the square ABCD, what is the probability that the dot to be within the shaded region?

5. There are 20 balls in a box. Some are yellow and the rest are blue. The probability of getting a blue ball from the box without looking to it is 0.35. Then

a) How many blue balls are there in the box?

b) How many yellow balls are there?

6. A regular hexagon is drawn with its vertices on a circle. Without looking into the picture, if one put a dot in that picture, what is the probability of being the dot in the regular hexagon?



Did you get the answers?
Let us see...

WORKSHEET FOR 29TH SEPTEMBER 2020

A JOINT VENTURE OF DIET PALAKKAD AND SSK PALAKKAD

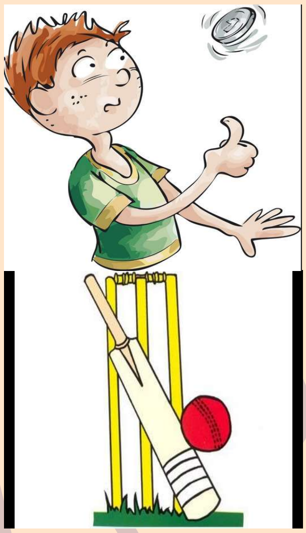
INTER BELL
INTERVENTION BASED ON EFFECTIVE LEISURE LEARNING

STUDENT SUPPORT MATERIAL for X Mathematics

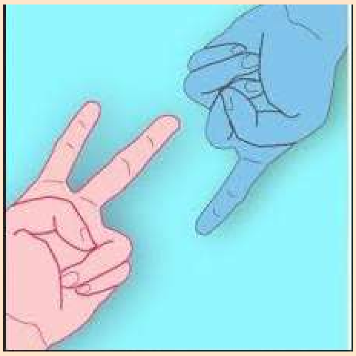
Match is about to begin

Can you predict and win

Which two teams will meet today in IPL dhamaka?...
Who will win toss today?...
Whether the toss winning captain will put opposition into batting or bowling?...
Which is likely to happen?...



Have you played odd or even?
Can we play today?
Who has more chance of winning?
One who says odd or one who says even?



Have you played Snake and Ladder?
Can we play?
We need a dice.
How many faces does a dice have?
Which are the numbers (number of dots) written on each face?

Have you heard about the hazard(gambling) happened in "Kourava sabha"?
What was used there for playing?
Dice itself.
Throwing two dice at a time.
Which sum has more chance of winning?

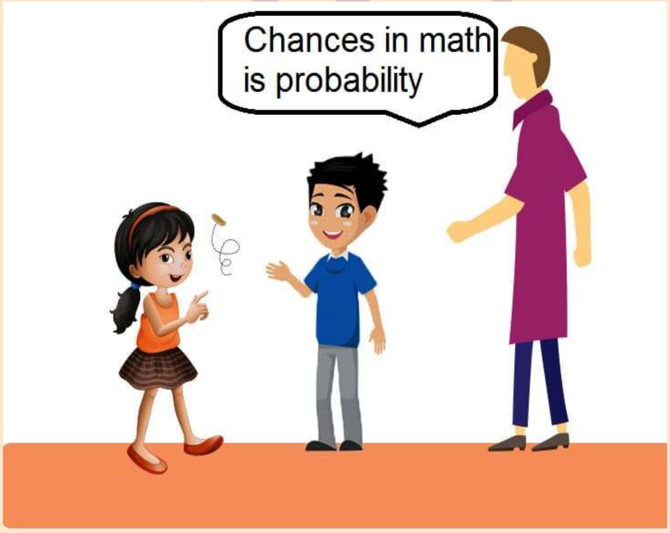
In all these situations the result is not certain.
So we will predict or calculate its probability.

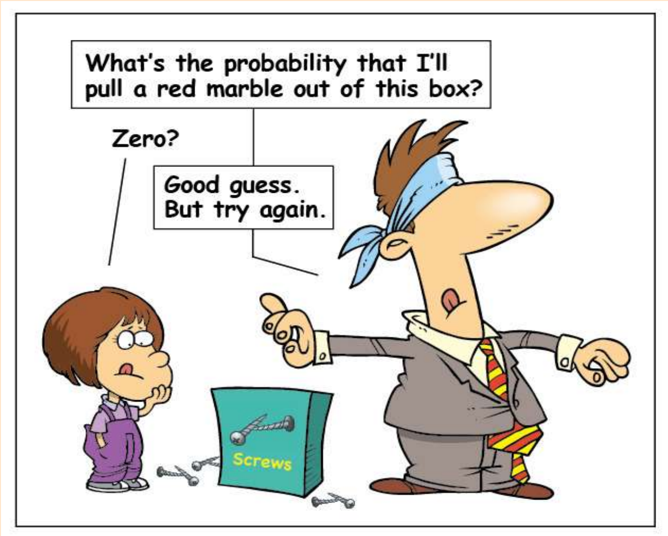
If we toss a coin ......It will be Head or Tail.... Both have equal probability....

In odd or even game, the sum will be either odd or even.
If we are using the fingers of one hand,
There is a slight advantage of saying "even" , isn't it?
If we roll a dice there is equal possibility of getting numbers 1 to 6. Isn't it?
In every situations, possibilities like this can not be assessed numerically. Some times it can be assessed according to the previous experiences.

For example, the winning chance of two teams playing today in IPL is assessed according to their previous results or performances.
After that it is converted into numbers.

So what is meant by Mathematics of chance?
For example, if we toss a coin, the outcome will be Head or Tail. There are two outcomes in total.
Winning Head is one out of these two. Half of the total or mathematically 1/2.
This is same in the case of Tail too...
Equal probability or possibility for both.





So mathematically probability is

" How much part is our favourable outcomes out of total outcomes."

Or

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

Odd and Even Farm Game

You will need:

Two players.

Two 1 – 6 dice.

Instructions:

Decide which player is collecting even numbers and which player is collecting odd numbers.

When it is your turn, roll both dice and add the numbers together. If the answer is odd write the number in the lamb's field. If it is even, write it in the calf's field. The first player to collect 10 numbers in their field is the winner.

Lamb's field

1,3,5,7,9,11

Calf's field

2,4,6,8,10,12

Questions

Q1

A box contains 6 black balls and 4 white balls.

1)Total Number of balls = ________

2) Number of white balls= ________

3)Number of black balls = ________

4)What is the probability of getting a white ball?

5) What is the probability of getting a black ball ?

Q2

A box contains paper slips written from 1 to 50.

1) How many paper slips are there in the box ?

2)How many even numbers are there in the box ?

3) What is the probability of getting an even number?

4)How many odd numbers are there in the box ?

5) What is the probability of getting an odd number?

6) How many multiples of 3 are there?

7) What is the probability of getting a multiple of 3?

8)How many multiples of 5 are there?

9)What is the probability of getting a multiple of 5?

10) How many numbers, which are multiple of both 3 & 5?

11)What is the probability of getting multiple of both 3 & 5?

12) How many prime numbers are there?

13) What is the probability of getting a prime number?

MATHEMATICS - STANDARD 10

WORKSHEET FOR 29TH SEPTEMBER 2020

Hint:

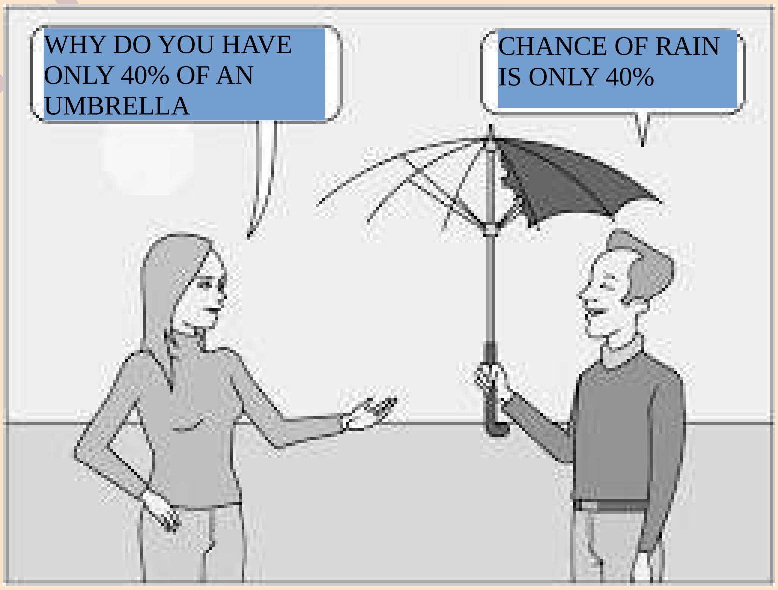
A box contains paper slips written from 1 to 50.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50

1) Total No of papers = _______

	Total Numbers	**Probability**
Even Number	2)	3)
Odd Number	4)	5)
Multiple of 3	6)	7)
Multiple of 5	8)	9)
Multiple of both 3 and 5	10)	11)
Prime numbers upto 50	12)	13)

Did you get the answers?
Let us see...



MATHEMATICS - STANDARD 10

WORKSHEET FOR 28TH SEPTEMBER 2020

A JOINT VENTURE OF DIET PALAKKAD AND SSK PALAKKAD

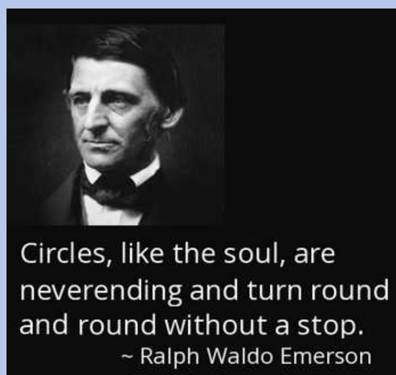
INTER BELL
INTERVENTION BASED ON EFFECTIVE LEISURE LEARNING

STUDENT SUPPORT MATERIAL for X Mathematics

Pierre Louis Maupertuis
Born on 28th September 1698

He theorised about aspects of Mathematics, Physics, Geology, and Biology. Maupertuis became a member of the Academy of Sciences in Paris in 1731 and soon became the foremost French proponent of the Newtonian theory of gravitation. In 1736 he led an expedition to Lapland to measure the length of a degree along the meridian. His measurement verified the Newtonian view that the Earth is an oblate spheroid (a sphere flattened at the poles).

Known for Principle of least action, Transmutation of species

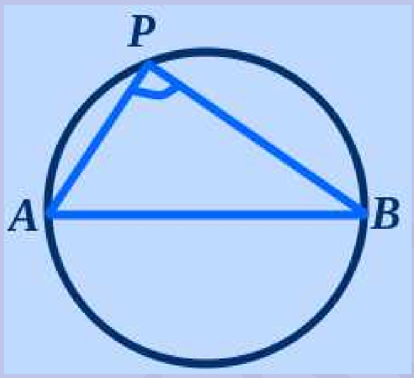
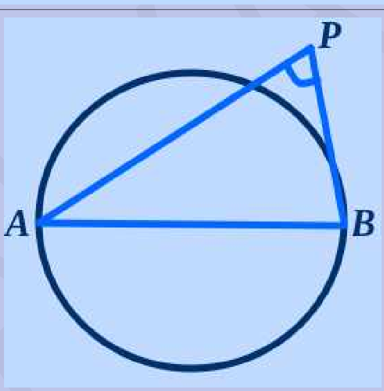
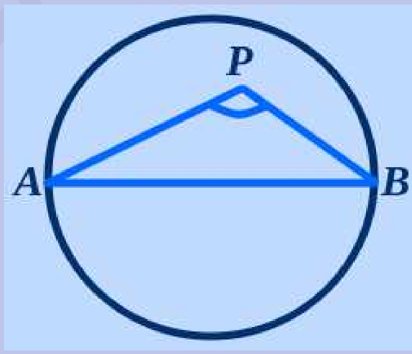


KITE VICTERS STD 10

Mathematics - Class - 36

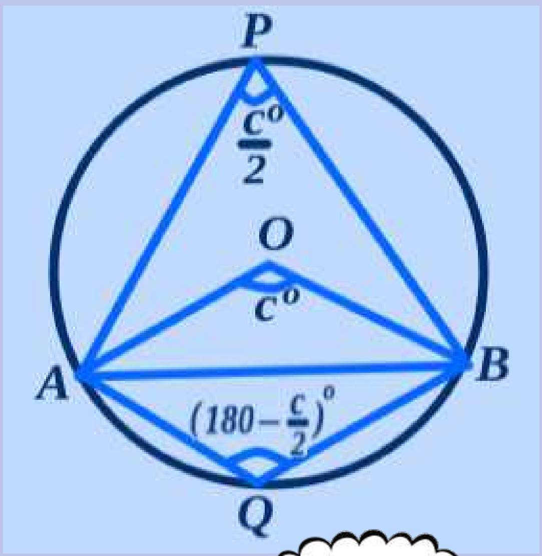
WORKSHEET FOR 28TH SEPTEMBER 2020

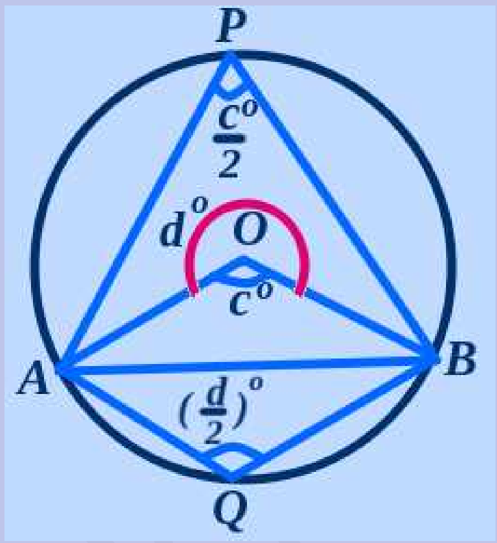
CIRCLES – POINTS TO REMEMBER

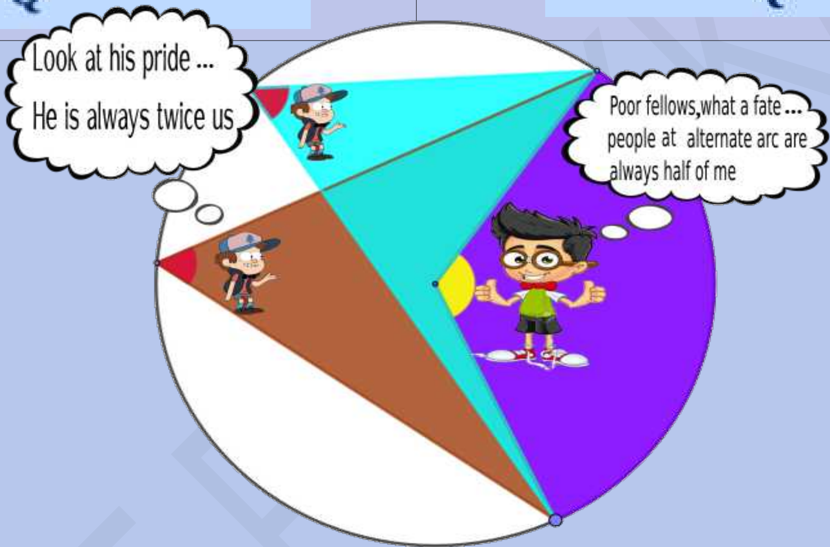
1. If AB is a diameter,	
Angle in a semicircle is 90º. $\angle APB = 90^\circ$.	
If P is outside the circle, $\angle APB < 90^\circ$.	
If P is inside the circle, $\angle APB > 90^\circ$.	

WORKSHEET FOR 28TH SEPTEMBER 2020

2. Chord, Angle and Arc - If O is the centre and AB is a chord,

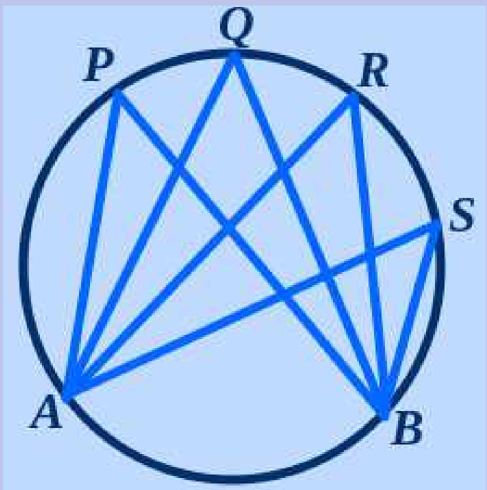


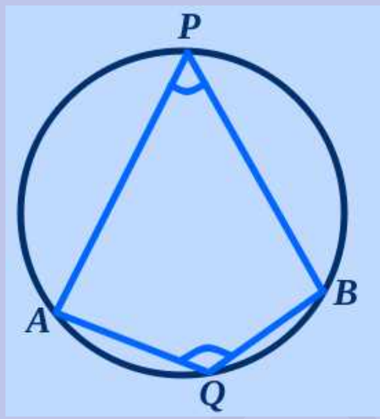




3. All angles made by an arc on the alternate arc are equal.

∠APB = ∠AQB = ∠ARB =∠ASB



4. A pair of angles on an arc and on its alternate arc are supplementary. $\angle P + \angle Q = 180^o$.	

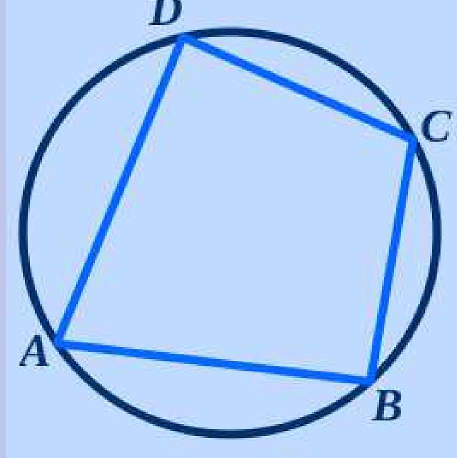
5. To draw a triangle with given angles and circum radius:

i) *Draw a circle with given radius.*

ii) *Construct central angles same as "the double" of the angles of the required triangle.*

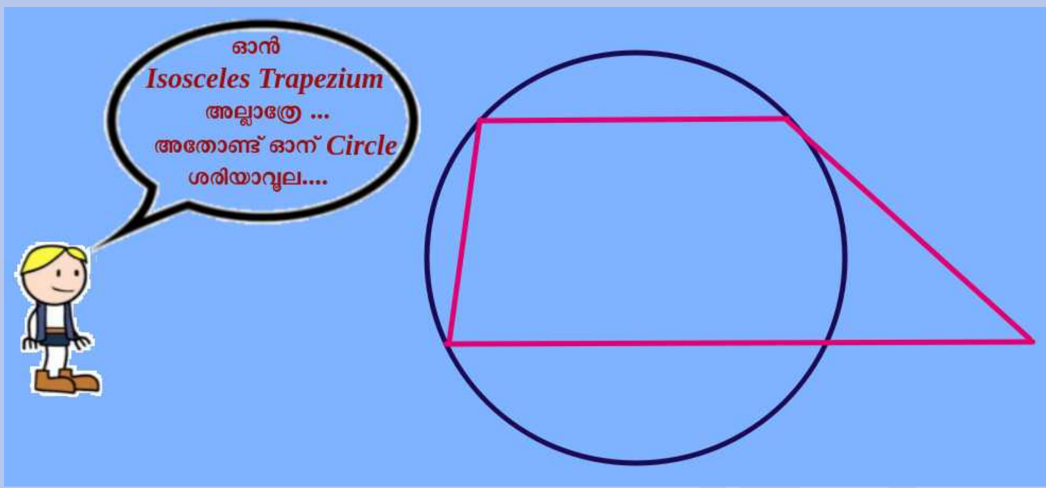
iii) *Mark the points on the circle where these angles meet.*

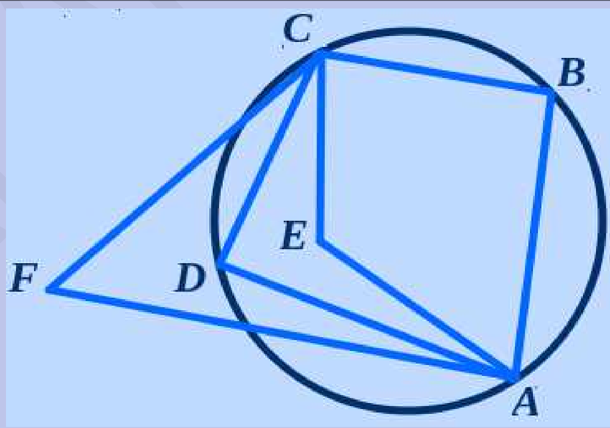
iv) *Join these points to get the required triangle.*

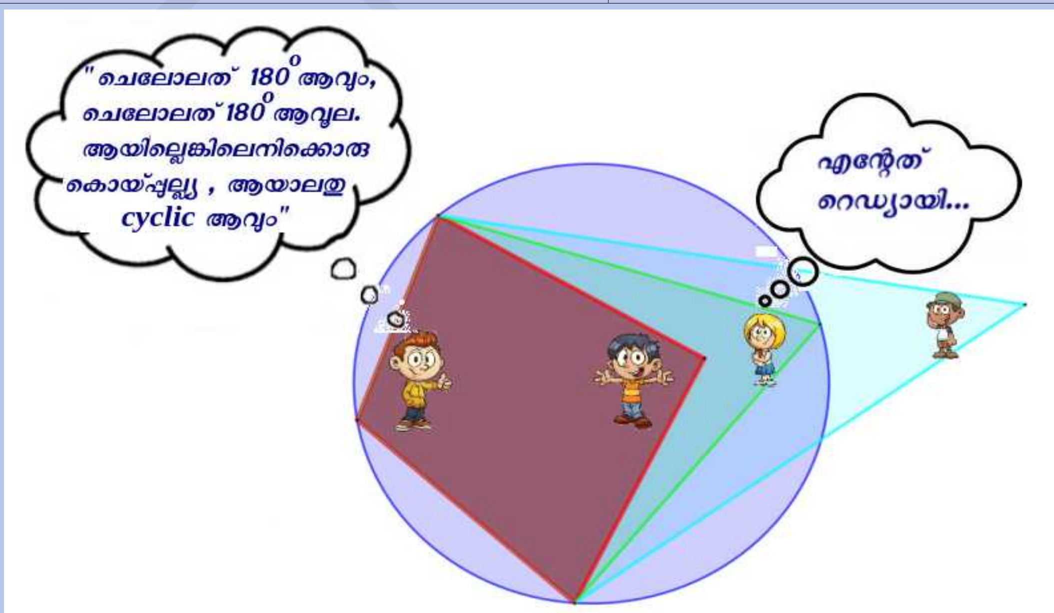
6. Cyclic quadrilateral	
If all the four vertices of a quadrilateral are on a circle then it is called a cyclic quadrilateral. Opposite angles are supplementary. $\angle A + \angle C = \angle B + \angle D = 180^o$.	

WORKSHEET FOR 28TH SEPTEMBER 2020

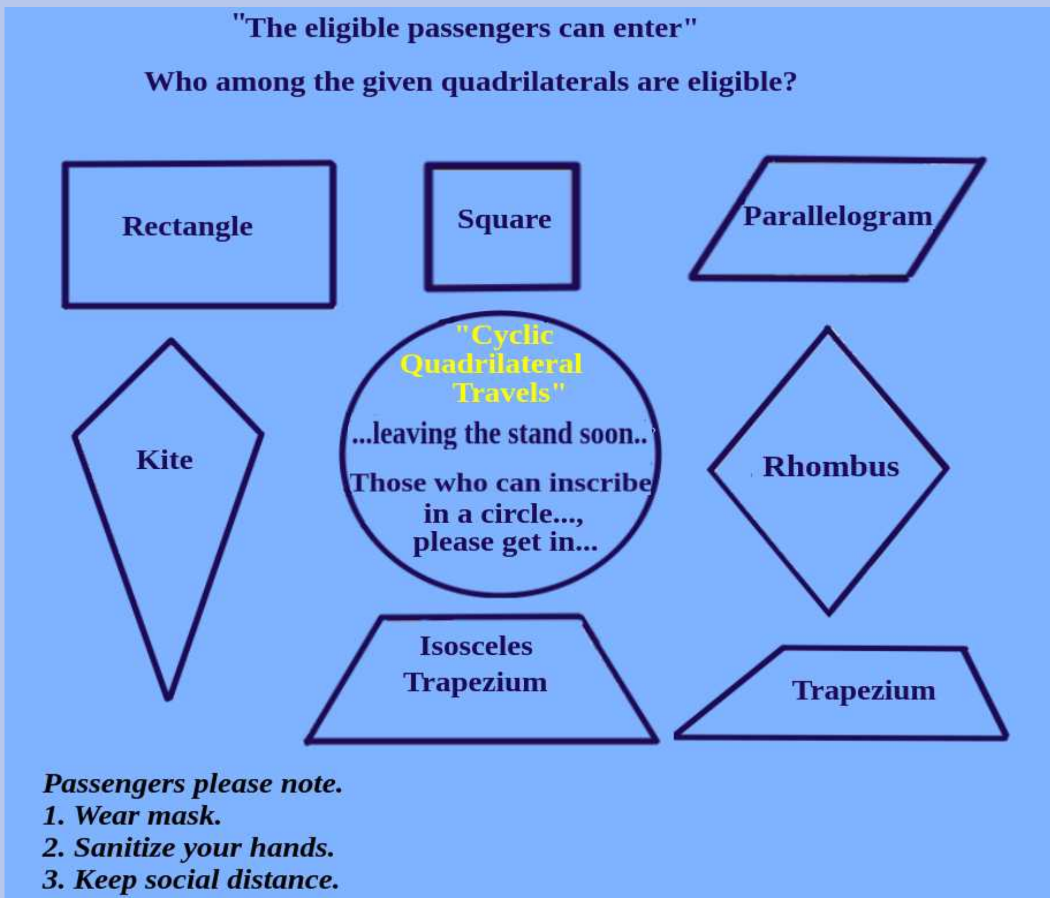
7. Any quadrilateral, whose opposite angles are supplementary, is cyclic. Square, rectangle, and isosceles trapezium are few examples for cyclic quadrilateral.



8. $\angle B + \angle D = 180^o$. *Since F is outside the circle,* *$\angle B + \angle F < 180^o$.* *Since E is inside the circle,* *$\angle B + \angle E > 180^o$.*	

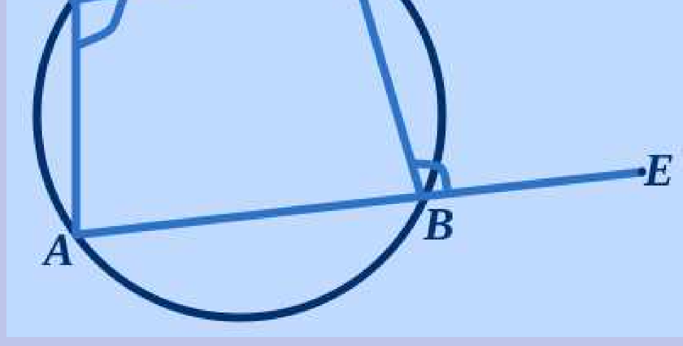


9. To prove a quadrilateral is cyclic, it is enough to prove that the sum of any pair of opposite angles is 180º.



10. The outer angle of a cyclic quadrilateral is equal to the inner angle at the opposite vertex.

$\angle D = \angle CBE$



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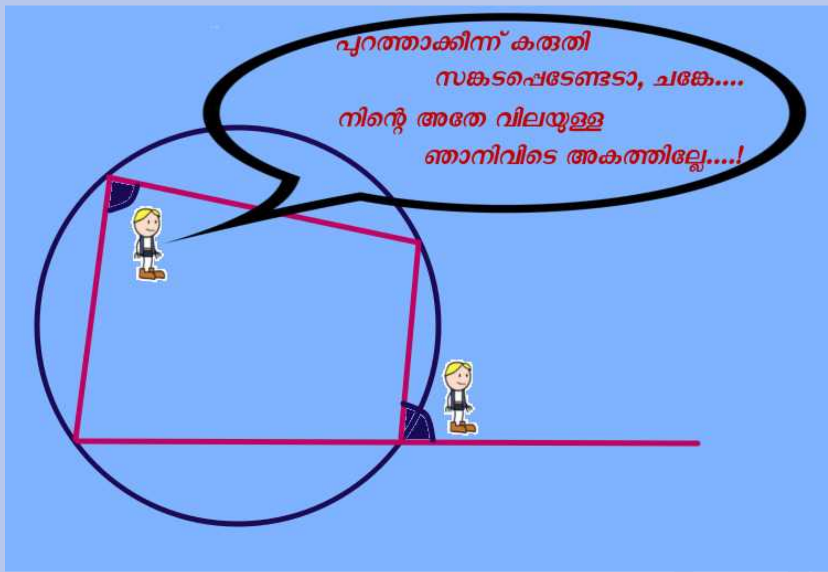
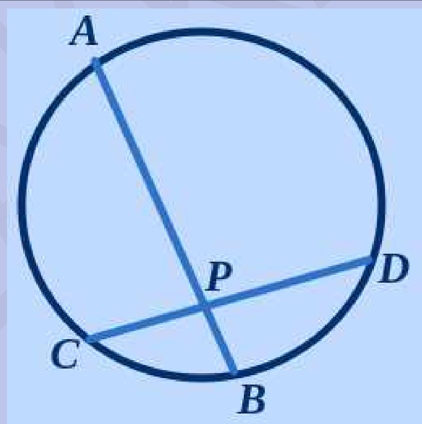
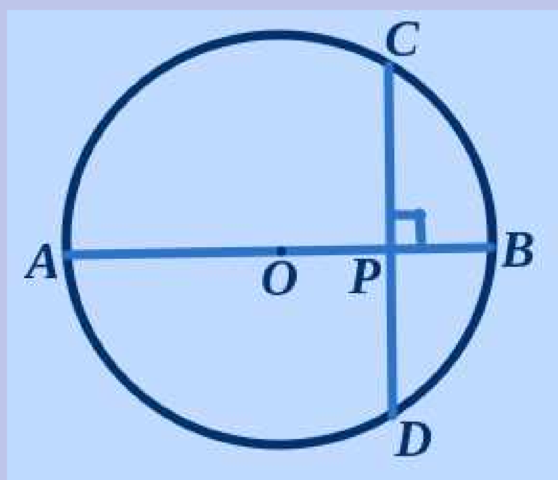


11. If AB and CD are two chords intersecting at P, then $PA \times PB = PC \times PD$ ***(This concept can be used to draw rectangles whose area is same as that of another rectangle)***	

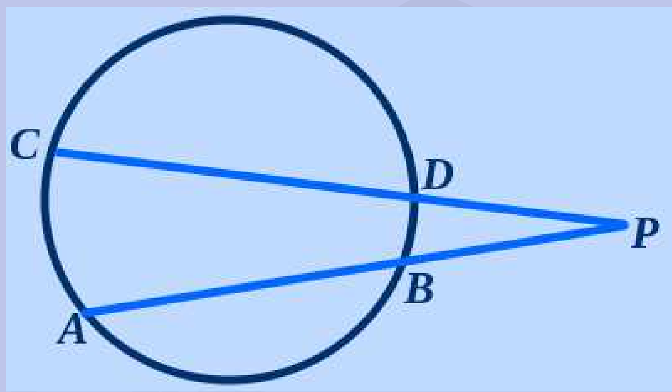
12. Diameter and a chord	
If AB is a diameter and AB perpendicular to CD, then $PC = PD$ $PA \times PB = PC^2$ or, $PA \times PB = PD^2$.	

13. The above concept can be used to draw

i) Lines of irrational length

ii) Square whose area is same as that of a rectangle.

14. If two chords AB and CD meet a point P, outside the circle, then, PA × PB = PC × PD



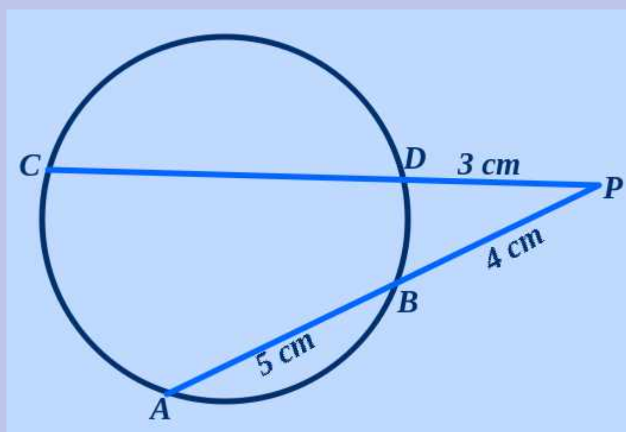
<u>Question:</u>

1. In figure, PB = 4cm, AB = 5cm and PD = 3cm. Then,

a) Find the length of PA.

b) Write down an expression for the length of PC.

c) Find the length of CD.



WORKSHEET FOR 28TH SEPTEMBER 2020

Important constructions:

1. ***Construct an angle of*** $22\frac{1}{2}^{o}$.

2. ***Draw a triangle with angles*** $30^o, 70^o$ ***and*** 80^o ***and with circum radius 2.5 cm.***

3. ***Draw a rectangle of length 5 cm and breadth 3 cm.***

   i) Draw another rectangle with length 6 cm and having an area same as that of the given rectangle.

   ii) Draw a square of same area.

4. ***Draw a line of length*** $\sqrt{12}$ ***cm.***

5. ***Draw a square of area 15*** cm^2.

Try this....