Mathematics Online Class X On 19-07-2021
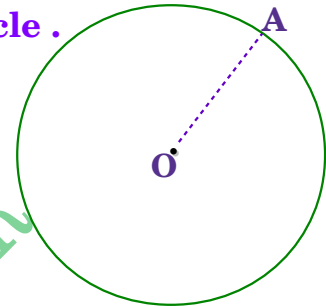
CIRCLES   click

Circle

Circle is a collection of points which are equidistant from a fixed point on a plane .

Fixed point is called the centre of the circle . Here O is the centre of the circle .
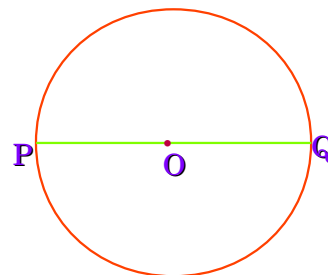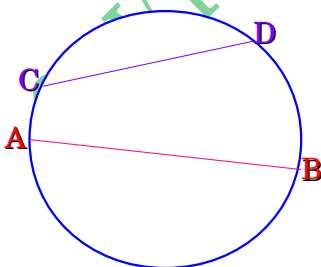
Distance from centre to any point on the circle is the radius of the circle . OA is the radius of the circle .

Diameter

Two times the radius is the diameter of a circle .
Diameter = 2 radius

Chord

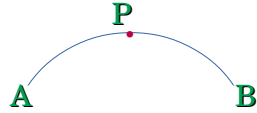Chord is the line joining any two points on a circle .

Here AB and CD are chords of a circle .
Longest chord of a circle is the diameter of the circle .
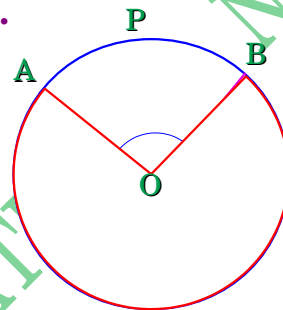Here PQ is the diameter of the circle .

Arc

Arc is a part of a circle . APB is an arc .
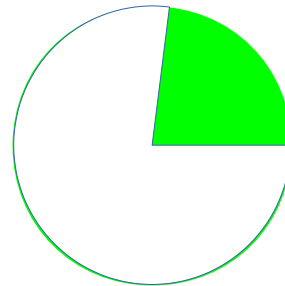
P

A   B

Central angle of an arc

If we join the end points of an arc to the centre of the circle , the angle so formed is called the central angle of the arc .
∠AOB is the central angle of arc APB .

P

A   B

O

Sector

The shape formed by the arc and radii through the end points is called sector .

Note :

The measure of central angle of an arc may be a number between 0^0 and 360^0 .

If the central angle of an arc is 180^0 , the arc is half of the circle then it is called a semicircle .
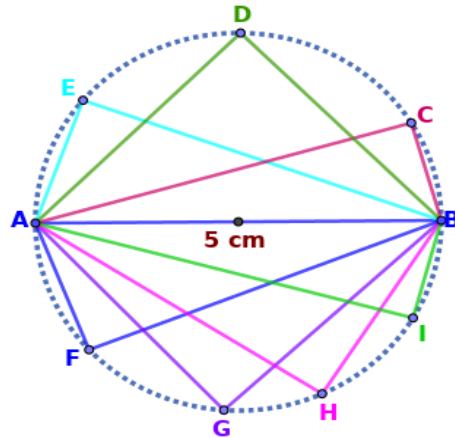
If r is the radius of the circle ,

(i) Area of circle = πr^2

(ii) Perimeter of the circle = $2\pi r$ or πd [d is the diameter]

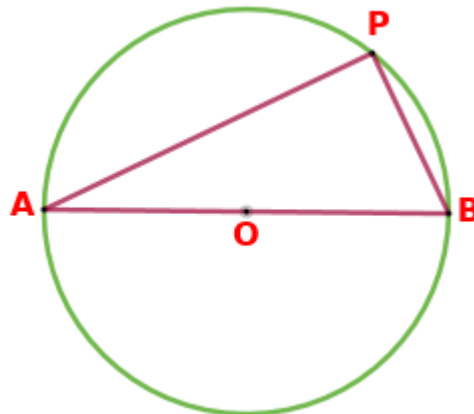**Draw a line of length 5 cm Draw right triangles with this line as hypotenuse**

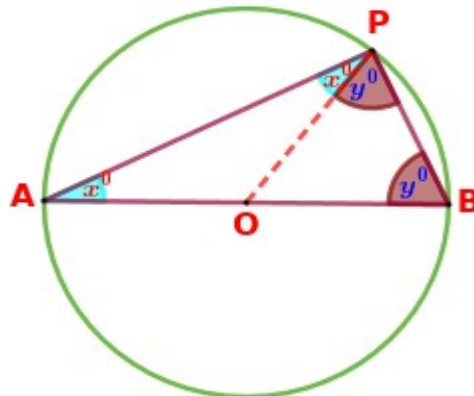**[Note : In right triangle angle opposite to hypotenuse is 90^0]**

Question

In the figure , AB is a diameter and P is a point on the circle .

Find ∠APB ?

Answer

In the figure , AB is a diameter and P is a point on the circle .
O is the centre of the circle . Join OP .

Let $\angle APO = x^0$ and $\angle BPO = y^0$

$\therefore \angle APB = x^0 + y^0$

OA = OP = OB [Radii of the same circle]

$\triangle AOP$ and $\triangle BOP$ are isosceles triangles .

We know in an isosceles triangle angles opposite to equal sides are equal .

$\angle APO = \angle PAO = x^0$ OA = OP

$\angle BPO = \angle PBO = y^0$ OP = OB

We know sum of all inner angles of a triangle is 180^0.

In $\triangle APB$, $\angle A + \angle B + \angle APB = 180^0$

$$x^0 + y^0 + x^0 + y^0 = 180^0$$

$$2 (x^0 + y^0) = 180^0$$

$$(x^0 + y^0) = \frac{180^0}{2} = 90^0$$

$$\therefore \angle APB = 90^0$$

If we join the ends of a diameter of a circle to a point on the circle , we get a right angle .

OR

Angle in a semicircle is a right angle

Assignment

Use a calculator to determine upto two decimal places, the perimeter and the area of the circle in the picture.