Exercise 4.5

1. Fill in the blanks:

(i) A parallelogram that contains a right angle is _____.

(ii) An equilateral rectangle is a _____.

(iii) A polygon with four sides is a _____.

(iv) The diagonals of a parallelogram _____ each other.

(v) The opposite angles of a parallelogram are _____.

Answers:

(i) Rectangle (ii) Square (iii) Quadrilateral

(iv) Bisect (v) Congruent

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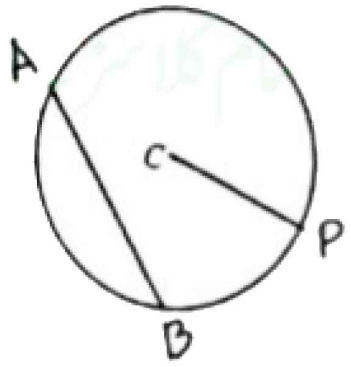


A circle is the set of points in a plane which are at a constant distance from a fixed point in the plane.

Centre

The fixed point C is called the centre of the circle.

Radial Segment

P is any point on the circumference of the circle with centre O. $\overline{OP}$ is called the radial segment of the circle.

Radius

A radius of a circle is the length of a segment joining the centre to any point on the circle. In the given figure is $m\overline{CP}$ the radius. Usually represented by 'r'.

Chord

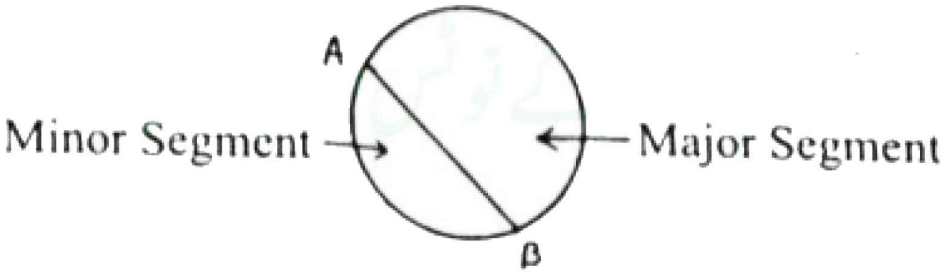
A chord of a circle is a segment connecting any two points on the circle. In the given figure $\overline{AB}$ is a chord.

Segment of a Circle

A chord $\overline{AB}$ of a circle divides the circle in two parts. These are called segment of the circle.

Minor Segment

The included area between minor arc and the chord is minor segment.



Major Segment

The included area between major arc and chord is called major segment.

Diameter

A diameter of a circle is a chord that passes through the centre. The length of a diameter of a circle is twice the length of the radius of the same circle.

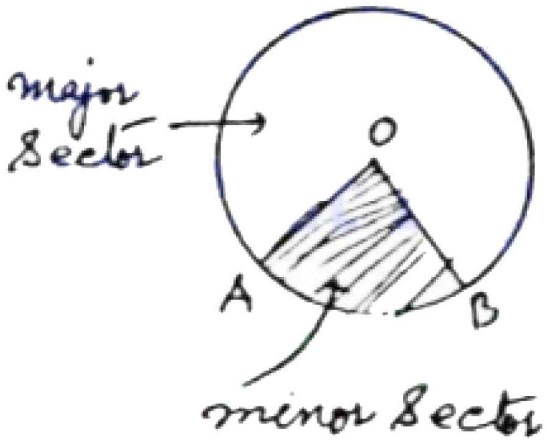
$$\boxed{Diameter = 2 \times radius}$$

Equal Circles

Equal circles are circles having equal radii or equal diameter

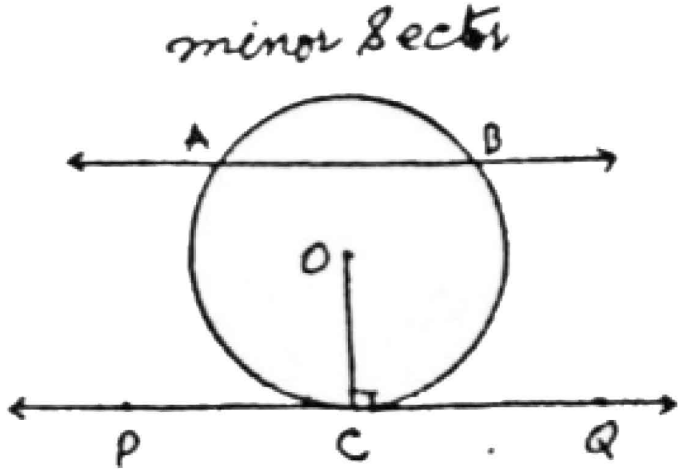
Sector

A sector is the circular region bounded by an arc of a circle and its two corresponding radial segments is called a sector of the circle. In the figure, region AOB is the sector of the circle with centre at O.



Secant

A secant is a line which intersects a circle in two points.



Tangent

A tangent to a circle is the line perpendicular to radius of the circle at its outer extremity.

The point on the circle at which the radius and tangent meet is knwon as the Point of Contant or Point of Tangency.

Angle in a Semi-Circle is a Right Angle

1- Draw a line-segment $\overline{AB}$ of any length. Mark the mid point of $\overline{AB}$ as O.

2- Draw a semi-circle on $\overline{AB}$ with radius $\overline{OA}$.

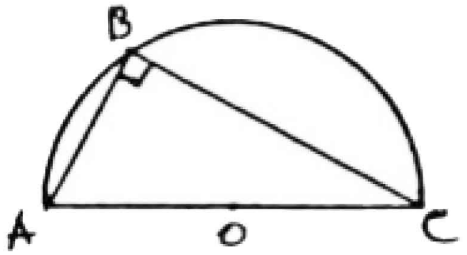
3- Take any point C on the semi-circle. Join A with C and B with C.

Thus, $\angle ACB$ is an angle in the semi-circle APB.

4- Now take a protractor and place it along $\overline{AC}$ so that the centre of the protractor falls on C.

We note that the measure of the $\angle ACB$ by looking at the marking on the protractor corresponding to arm $\overline{CB}$ of $m\angle ACB$ is of 90^{O}, i.e $m\angle ACB = 90^{O}$ or a right angle.

Thus, angle in a semi-circle is a right angle.



Angles in the Same Segment are Equal:

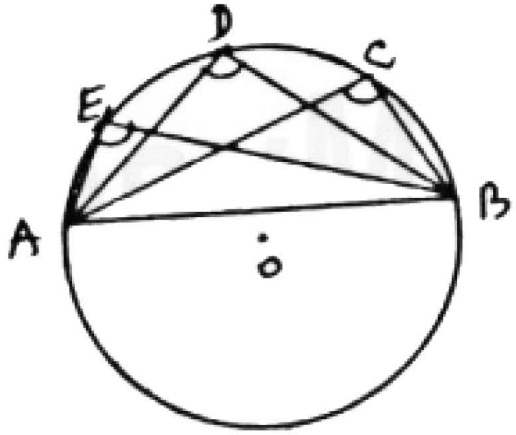
Draw a circle with centre 'O'. Take two points B and C on the circle and join them. $\overline{BC}$ divides the circle into two parts.

Draw angles, $\angle BAC$ and $\angle BDC$ in the same segment as shown in the figure. Take a sheet of tracing paper and

make a trace copy of $\angle BAC$. Place the trace copy of $\angle BAC$ on $\angle BDC$.

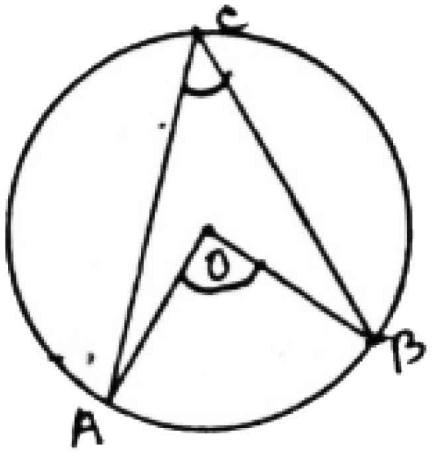
A falls on D and $\overline{AB}$ falls on $\overline{DC}$.

So that we observe that $\overline{BD}$ falls on $\overline{AC}$. Thus $\angle BAC = \angle BDC$, this shows that angles in the same segment are equal.



Central Angle

The central angle of a minor arc of a circle is double that the angle subtended by corresponding major arc.



$$m\angle AOB = m\,2\angle ACB$$