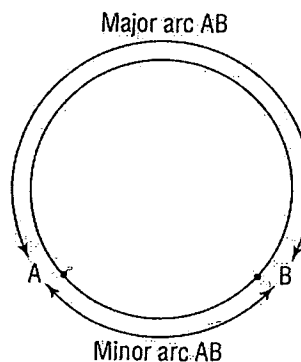**7.3 – Properties of Angles in a Circle**

Arcs

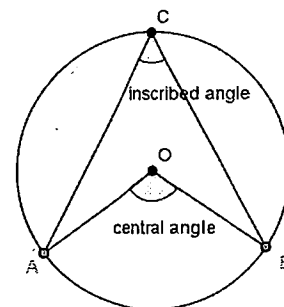A section of the **circumference** of a circle is an **arc**.

The shorter arc AB is the **minor** arc.

The longer arc AB is the **major** arc.

Angles

The angle formed by joining the **endpoints** of an **arc** to the **centre** of the circle is called a **central** angle.

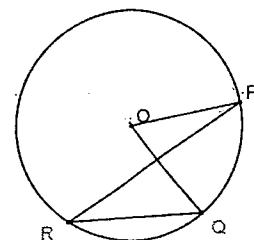The angle formed by joining the endpoints of an arc to a **point** on the circle is called an **inscribed** angle.

The inscribed and central angles in this circle are **subtended** by the arc **AB**.
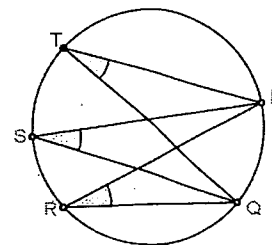
Central and Inscribed Angle Property:

The **central** angle is **twice** the size of the **inscribed** angle when both angles are subtended by the same arc.
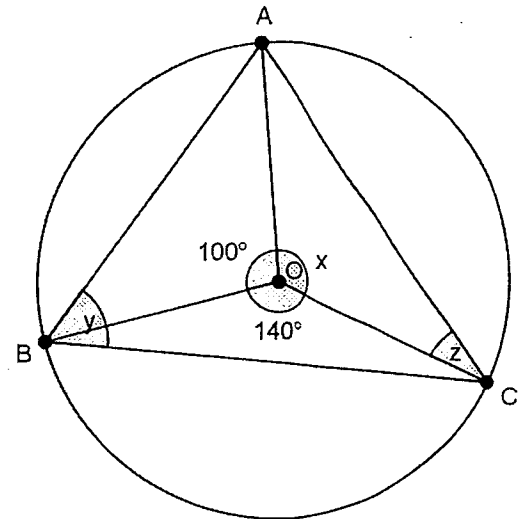
$\angle POQ = \underline{\mathbf{2} \angle \mathbf{PRQ}}$

$\angle PRQ = \underline{\mathbf{1/2} \angle \mathbf{POQ}}$

Inscribed Angles Property:

All inscribed angles **subtended** by the same arc are **congruent** (**equal**).

Ex. 3 Triangle ABC is inscribed in a circle, centre O.
   $\angle AOB = 100°$ and $\angle COB = 140°$
   Determine the values of $x°$, $y°$ and $z°$.

Answer: **To solve $\angle x$:**
   **All angles in a circle add up to 360°, so**
   360 − 100 − 140 = 120°

   To solve $\angle y$:
   Since $\angle ABC$ is an inscribed angle and
   $\angle AOC$ is a central angle subtended by
   the same arc, $\angle ABC = ½ \angle AOC$
   Therefore, $\angle ABC = ½ (120) = 60°$

   To solve $\angle z$:
   Since OB, AO and OC are radii, all of the triangles are isosceles.
   Therefore $\angle z = \angle OAC$. Since all angles of a triangle add up to 180°,
   120 + z + z = 180
   2z = 180 − 120
   2z = 60
   z = 30°

Ex. 4 Point O is the centre of the circle. Determine the value of $x°$ and $y°$.
   Which circle properties did you use?
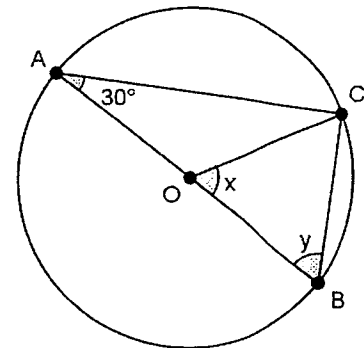
Answer: **Since AO, OC, and OB are all radii, they are**
   isosceles triangles.
   Therefore, $\angle OAC = \angle ACO = 30°$
   So $\angle AOC = 180 − 30 − 30 = 120°$.
   And $\angle x = 180 − 120 = 60°$

   $\angle ACB = 90°$, so $\angle ABC = 180 − 30 − 90 = 60°$

Assignment	Do #3-6, 11 p. 410
	Do #1 – 10 p. 418 Chapter Review

This is the end of Unit 7 – Circle Geometry. The unit test will be on _____ !