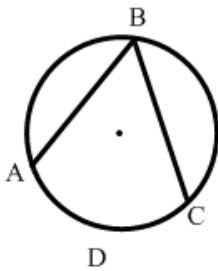


Circle Geometry

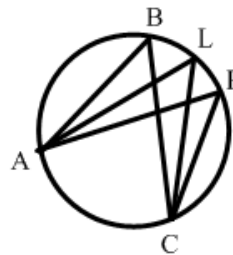
1. **Chord** – A line segment joining 2 points on a curve such as a circle.
2. **Inscribed Angle** – An angle whose vertex lies on the circle and whose arms intersect the circle.

We say that the inscribed angle is **subtended** by the arc of the circle which is cut off by the arms of the angle and which does not contain the vertex.

Examples:



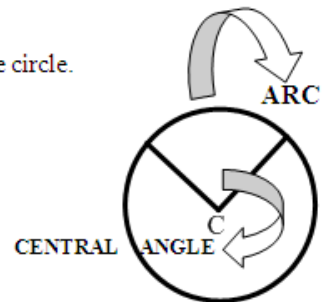
- $\angle ABC$ is an inscribed angle
- Arc ADC subtends $\angle ABC$



- A given arc subtends many inscribed angles.
- $\angle ABC$, $\angle ALC$, and $\angle APC$ are all subtended by the same arc AC.

Do you see any other angles subtended by the same arc???

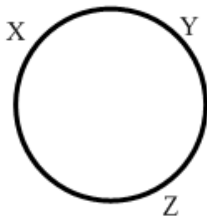
3. **Central Angle** – The angle formed by the radii at the centre of the circle.



Note:

- The symbol for an arc is \frown .
- A **major arc** is an arc that is more than half of the circumference of a circle (semicircle).
- A **minor arc** is an arc that is less than a semicircle.
- We name arcs by their endpoints, and for a major arc or a semicircle we need to include a point in between.

Example:

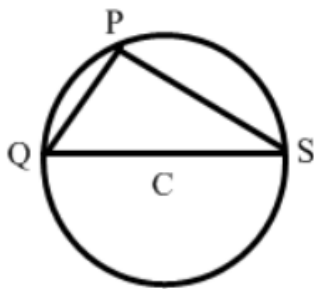


Here, \widehat{XYZ} is a **major arc** and \widehat{XY} is a **minor arc**.

Angles in a Circle

Angle Property I

The inscribed angle drawn on a diameter is a right angle.

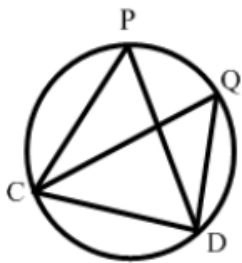


QS is a diameter.

$$\angle P = 90^\circ$$

Angle Property II

Inscribed angles drawn on the same side of a chord have equal measures.

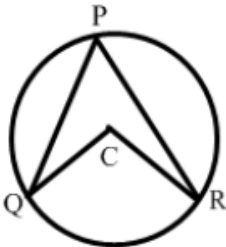


$\angle P$ and $\angle Q$ are inscribed on the same chord CD.

$$\angle P = \angle Q$$

Angle Property III

The measure of a central angle in a circle is twice the inscribed angle drawn on the same chord.

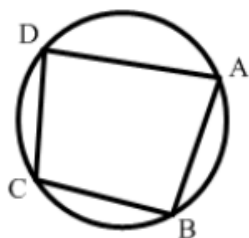


$\angle P$ and $\angle QCR$ are inscribed on the same chord QR.

$\angle P = \frac{1}{2} \angle QCR$ or $\angle QCR = 2 \angle P$

Angle Property IV

The opposite angles of an **inscribed quadrilateral** are supplementary (add to 180°)



ABCD is an inscribed quadrilateral.

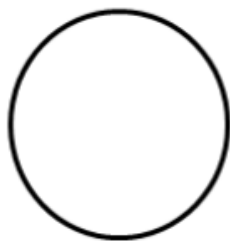
$\angle A$ and $\angle C$ are opposite, therefore $\angle A + \angle C = 180^\circ$

$\angle B$ and $\angle D$ are opposite, therefore $\angle B + \angle D = 180^\circ$

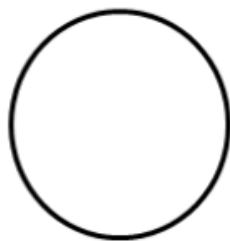
PARTS OF A CIRCLE / CIRCLE ANGLE PROPERTIES

Draw or highlight each of the following:

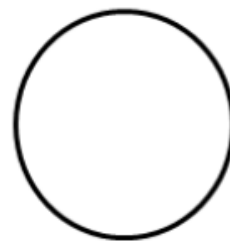
1. Diameter



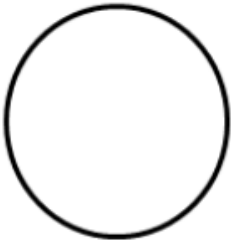
2. Radius



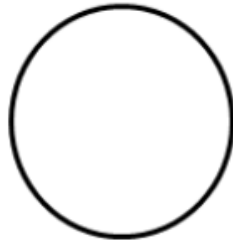
3. Circumference



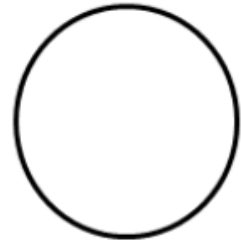
4. Minor Arc



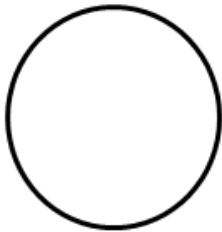
5. Major Arc



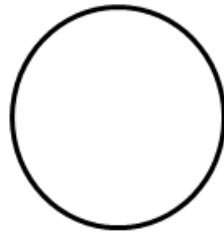
6. Chord



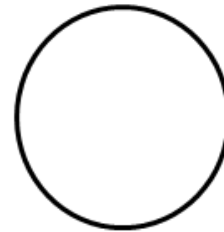
7. Sector



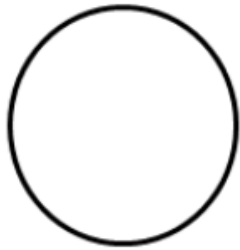
8. Segment



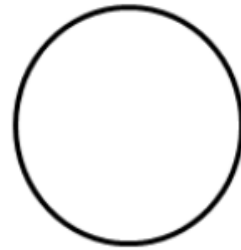
9. Central Angle ($\angle ACB$)



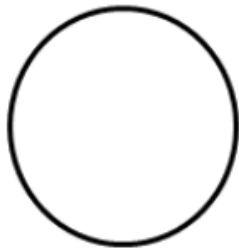
10. Inscribed Angle ($\angle ABC$)



11. 2 Angles Inscribed on Arc AB



12. A Central Angle and an Inscribed Angle on the same Arc AB



13. Cyclic Quadrilateral

