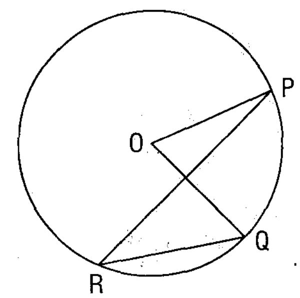
Central Angle and Inscribed Angle Property

In a circle, the measure of a central angle subtended by an arc is twice the measure of an inscribed angle subtended by the same arc.

$\angle POQ = 2\,\angle PRQ$, or

$\angle PRQ = \frac{1}{2}\,\angle POQ$

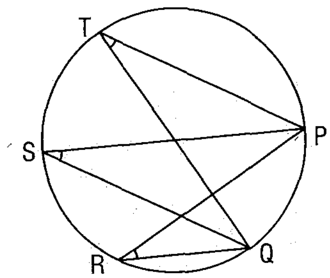


The above property is true for any inscribed angle.

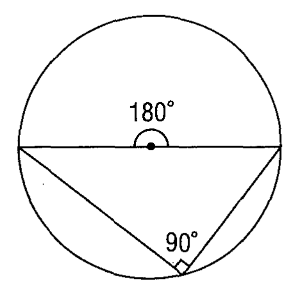
Inscribed Angles Property

In a circle, all inscribed angles subtended by the same arc are congruent.

$\angle PTQ = \angle PSQ = \angle PRQ$



➤ The two arcs formed by the endpoints of a diameter are semicircles.
The central angle of each arc is a straight angle, which is 180°.
The inscribed angle subtended by a semicircle is one-half of 180°, or 90°.

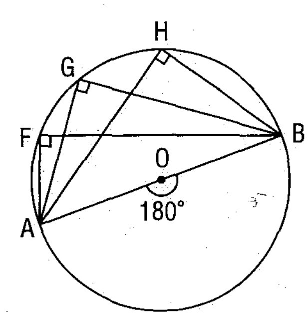


Angles in a Semicircle Property

All inscribed angles subtended by a semicircle are right angles.

Since $\angle AOB = 180°$,

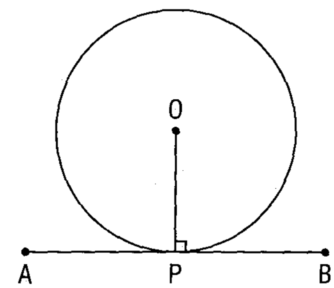
then $\angle AFB = \angle AGB = \angle AHB = 90°$



We say: The angle *inscribed* in a semicircle is a right angle.
We also know that if an inscribed angle is 90°, then it is subtended by a semicircle.

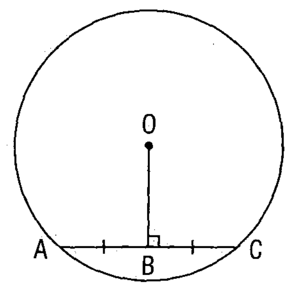
Study Guide

- A tangent to a circle is perpendicular to the radius at the point of tangency.
  That is, ∠APO = ∠BPO = 90°

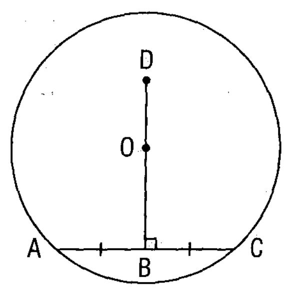


- The perpendicular from the centre of a circle to a chord bisects the chord.
  When ∠OBC = ∠OBA = 90°, then AB = BC

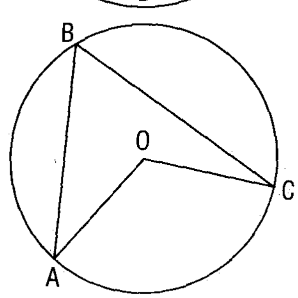
- A line segment that joins the centre of a circle to the midpoint of a chord is perpendicular to the chord.
  When O is the centre of a circle and AB = BC,
  then ∠OBC = ∠OBA = 90°



- The perpendicular bisector of a chord in a circle passes through the centre of the circle.
  When ∠OBC = ∠OBA = 90°, and AB = BC,
  then the centre O of the circle lies on DB.



- The measure of a central angle subtended by an arc is twice the measure of an inscribed angle subtended by the same arc.
  ∠AOC = 2∠ABC, or
  ∠ABC = $\frac{1}{2}$∠AOC



- All inscribed angles subtended by same arc are congruent.
  ∠ACB = ∠ADB = ∠AEB