

Exploring Inscribed Angles

Investigation 1: Exploring Inscribe Angles

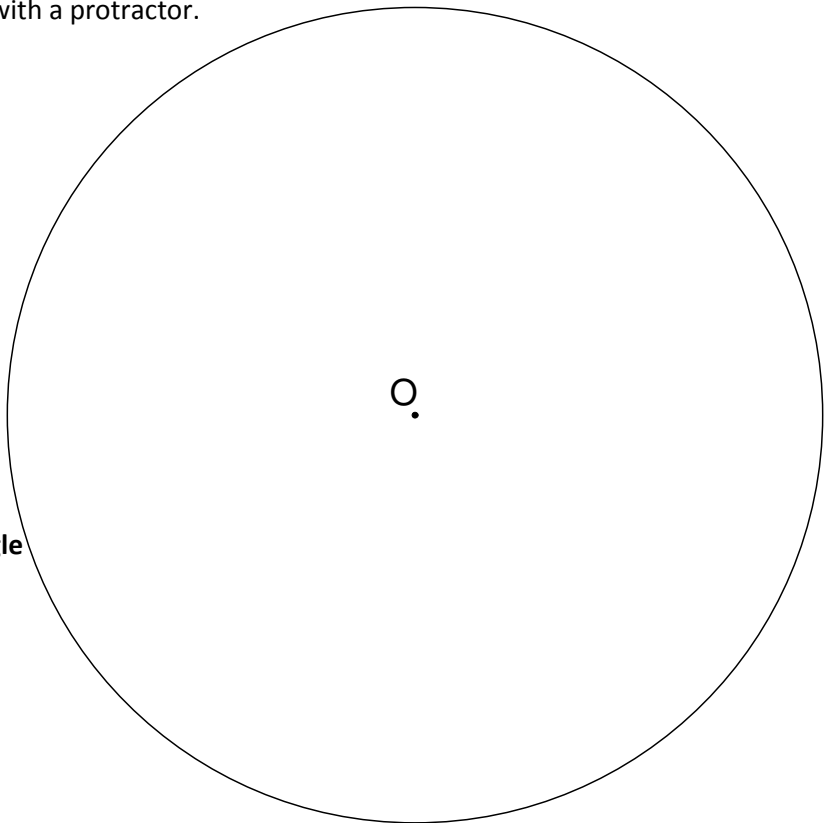
1. Draw central angle $\angle AOB$ and measure it with a protractor. $m\angle AOB =$ _____

What is the measure of the intercepted arc \widehat{AB} ? $m\widehat{AB} =$ _____

2. Now draw 4 inscribed angles with endpoints A and B , and vertices on the major arc \widehat{AB} .

Measure these inscribed angles with a protractor.

What are the measurements of these inscribed angles?



Inscribed Angle Theorem:

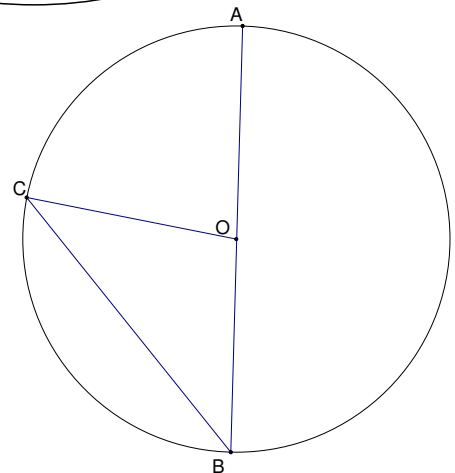
The measure of an inscribed angle is _____ the measure of the intercepted arc.

3. **Prove it!**

There are three possible cases. Let's prove the inscribed angle theorem for one of these cases

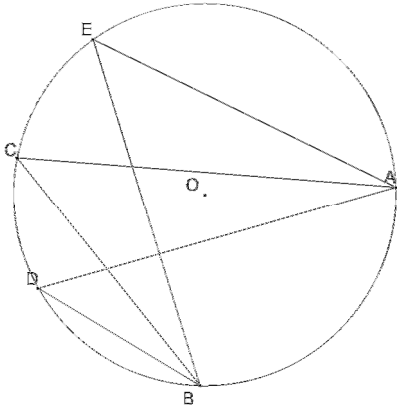
Given: Circle O with inscribed $\angle B$ and diameter \overline{AB} .

Prove: $m\angle ABC = \frac{1}{2}m\widehat{AC}$

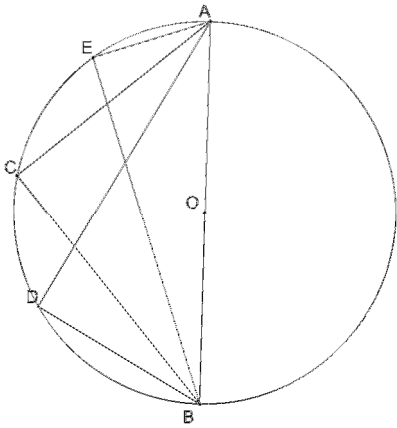


Inscribed Angle Corollaries:

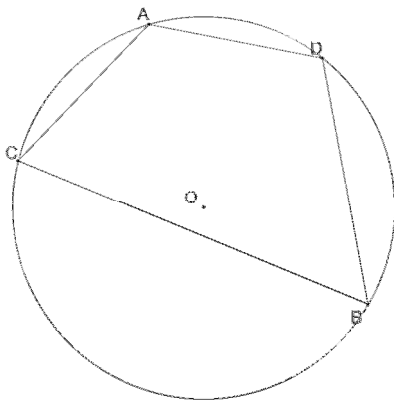
- Two inscribed angles that intercept the same arc are _____



- An angle inscribed in a semicircle is a _____

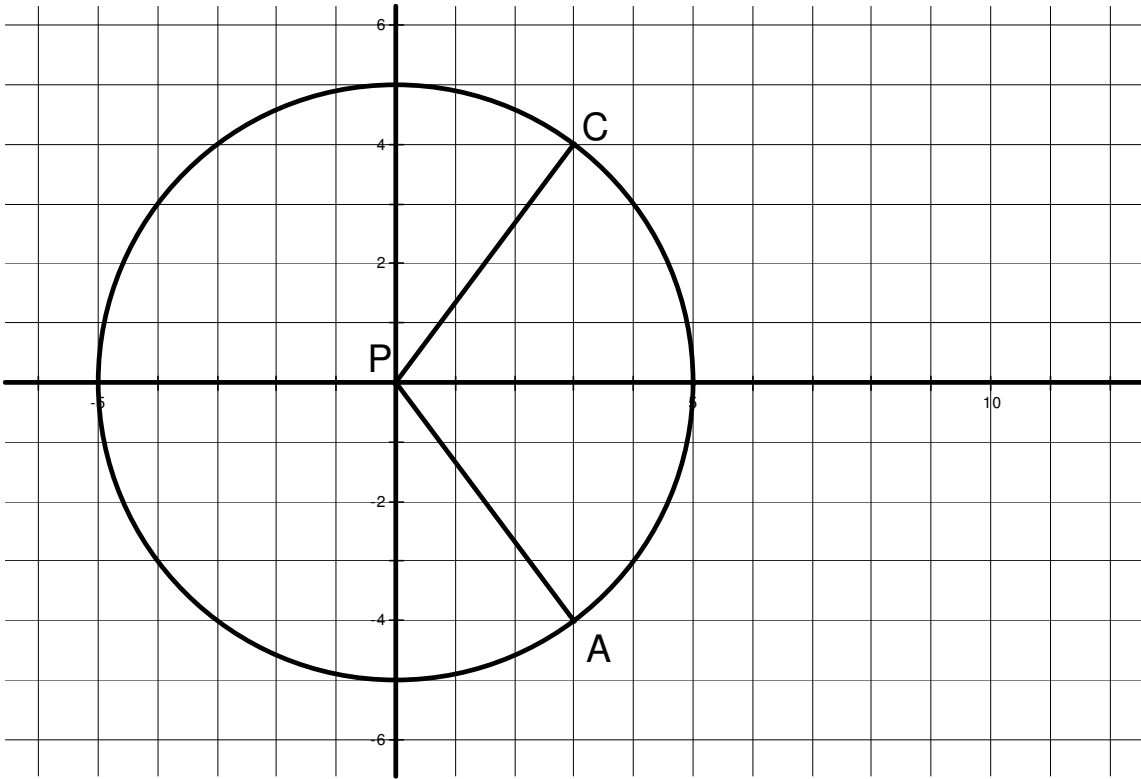


- The opposite angles of a quadrilateral inscribed in a circle are _____



Investigation 2: Chord-Tangent Angles

1. What is the slope of segment \overline{AP} ?



2. Find the equation of a line that is perpendicular to \overline{AP} that goes through point A.

Draw in this perpendicular line (without using a protractor). What kind of line is this in relation to the circle?

3. Draw in chord \overline{AC} . Measure the acute angle made by the chord \overline{AC} and this tangent line.
4. Measure $\angle CPA =$ _____
5. Find $m\widehat{CA} =$ _____
6. How do the measurements in (3) and (5) relate?

Theorem: The measure of an angle formed by a tangent and a chord is

_____ **the measure of the intercepted arc.**

