# Investigation 1: Exploring Inscribe Angles

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

What is the measure of the intercepted arc $\hat{AB}$? $m\hat{AB}=\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_$
2. Now draw 4 inscribed angles with endpoints *A* and *B* , and vertices on the major arc $\hat{AB}$.

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 $∠B$ and diameter $\overbar{AB}$.
**Prove:** $m∠ABC=\frac{1}{2}m\hat{AC}$

# Inscribed Angle Corollaries:

* Two inscribed angles that intercept the same arc are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* An angle inscribed in a semicircle is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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* The opposite angles of a quadrilateral inscribed in a circle are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_



# Investigation 2: Chord-Tangent Angles

1. What is the slope of segment $\overbar{AP}$?
2. Find the equation of a line that is perpendicular to $\overbar{AP}$ 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 $\overbar{AC}$. Measure the acute angle made by the chord $\overbar{AC}$ and this tangent line.
4. Measure $∠CPA=\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_$
5. Find $m\hat{CA}=\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_$
6. How do the measurement s 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.**