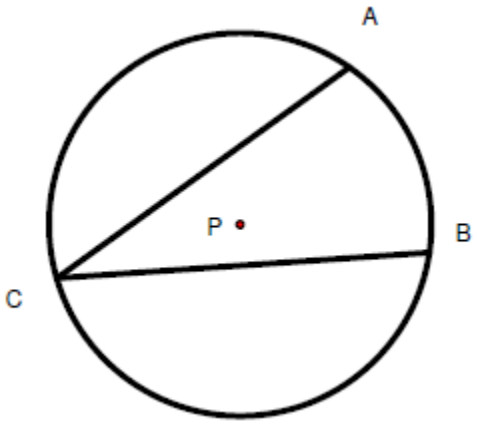
Lesson 2 Investigating Angle Relationships in Circles

In this task, you will be investigating, discovering, and proving two theorems that involve circles and their inscribed angles. Afterwards, you will be expected to memorize and apply these theorems, and several others that you will be shown, to solve problems.

Part 1: Inscribed Angles

Definition: an **inscribed angle** is an angle whose vertex lies on the circle and whose sides are chords of the circle.

In ○P, ∠ACB is an inscribed angle.



1. Sketch another inscribed angle in ○P.

2. Now, you need to investigate the measure of an inscribed angle and its intercepted arc by following your teacher's instructions.

3. Write your conjecture here:

Remember that a conjecture is not a theorem until it has been proved.

Part 2: Quadrilaterals Inscribed in a Circle

4. Define quadrilateral.

A polygon is **inscribed** in a circle when every vertex of the polygon is on the circle.

5. Sketch a picture of a circle P with an inscribed quadrilateral ABCD.

6. Now, you will investigate the relationships among the angles of the quadrilateral inscribed in a circle.

7. Write your conjecture here:

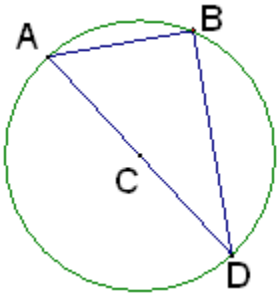
8. Write a proof of the theorem using your sketch from above.

Part 3: Graphic Organizer for Angle Theorems

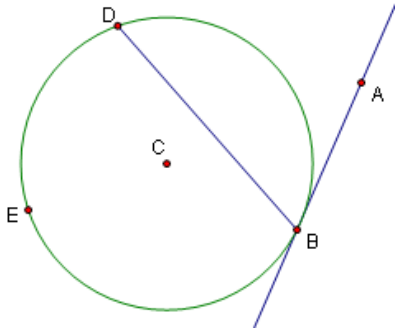
Location of the Vertex	Picture	Theorem
Inside the circle **At the Center**		
Not at the center		
Outside of the circle		
On the circle		

Part 4: Apply these theorems to solve these special cases of inscribed angles.

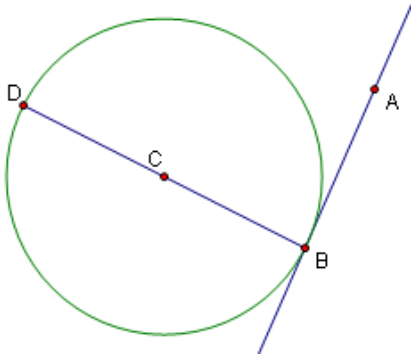
1. Find the m∠ABD, the inscribed angle of ○C.



2. Find the m∠ABD, the inscribed angle of ○C, if $m\widehat{BED} = 300°$.



3. Find the m∠ABD, the inscribed angle of ○C.



*****More Practice – BIG CIRCLES WS**