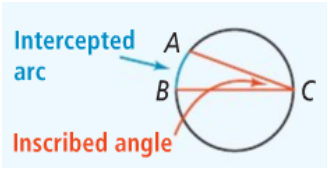
Lesson 12.3 Inscribed Angles (Clickers)

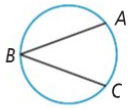
Three high-school soccer players practice kicking goals from the points shown in the diagram. All three points are along an arc of a circle. Player A says she is in the best position because the angle of her kicks toward the goal is wider than the angle of the other players' kicks. Do you agree? Explain.

An angle whose vertex is on the circle and whose sides are chords of the circle is an inscribed angle. An arc with endpoints on the sides of an inscribed angle, and its other points in the interior of the angle is an intercepted arc. In the diagram, inscribed ∠C intercepts arc AB.



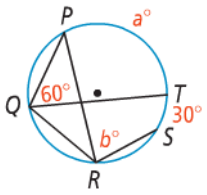
Theorem 12-11 Inscribed Angle Theorem

The measure of an inscribed angle is half the measure of its intercepted arc.

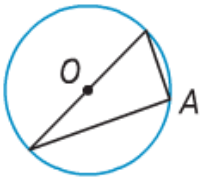


$$m\angle B = \frac{1}{2}m\overset{\frown}{AC}$$

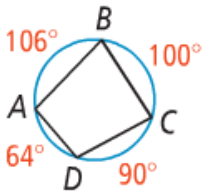
Ex. What are the values of a and b?



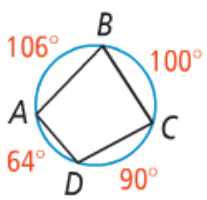
1 What is m∠A?



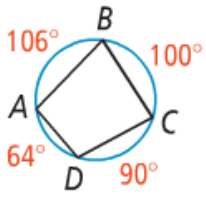
2 What is the m∠A?



3 What is the measure of ∠B?

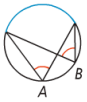


4 What is the measure of <C?



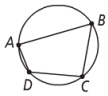
Corollaries to Theorem 12-11: The Inscribed Angle Theorem

Corollary 1
Two inscribed angles that intercept the same arc are congruent.

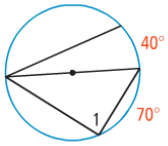


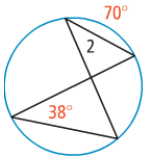
Corollary 2
An angle inscribed in a semicircle is a right angle.

Corollary 3
The opposite angles of a quadrilateral inscribed in a circle are supplementary.

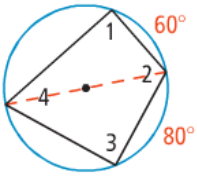


Ex. What is the measure of each numbered angle?

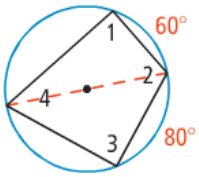




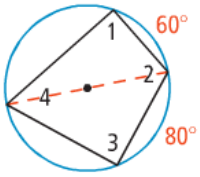
5 In the diagram below, what is the measure of <4?



6 In the diagram below, what is the measure of <2?

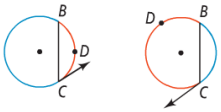


7 What is the measure of <3?



Theorem 12-12

The measure of an angle formed by a tangent and a chord is half the measure of the intercepted arc.



$$m\angle C = \frac{1}{2}m\overset{\frown}{BDC}$$

From the diagram, segment KJ is tangent to circle O. What are the values of x and y?