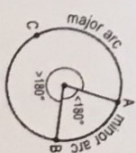


6.9 Inscribed Angles

SWBAT apply the rules and theorems of inscribed angles to solve for unknowns.



Major Arc:	Minor Arc:	Semicircle:
An arc of a circle measuring more than or equal to 180°	An arc of a circle measuring less than 180°	An arc of a circle measuring 180°

Central Angle: A central angle is an angle formed by two intersecting radii such that its vertex is at the center of the circle.

Central Angle Theorem: In a circle, or congruent circles, congruent central angles have congruent arcs.

Example 1: Identify the following in $\odot P$ at the right. For parts d-f, find the measure of each arc in $\odot P$.

a) A semicircle \overline{SRQ}

b) A major arc \overline{ST}

c) A minor arc \overline{ROT}

d) $m\widehat{SR} = 86^\circ$

e) $m\widehat{STQ} = 180^\circ$

f) $m\widehat{RT} = 121^\circ$

Inscribed Angle: An inscribed angle is an angle with its vertex "on" the circle, formed by two intersecting chords.

Inscribed Angle Theorem: The measure of an inscribed angle is half the measure of its intercepted arc.

$m\angle DEF = \frac{1}{2}m\widehat{FR}$

Example 2: What are the values of a and b?

$m\angle(2) = 120^\circ - a$

$120 + 30 = \frac{150}{2}$

$b = 75$

You Try! What are the $m\angle A$, $m\angle B$, $m\angle C$, and $m\angle D$?

Corollary 1:	Corollary 2:	Corollary 3:
Two inscribed angles that intercept the same arc are congruent.	An angle inscribed in a semicircle is a right angle.	The opposite angles of a quadrilateral inscribed in a circle are supplementary.

Example 3: What is the measure of each numbered angle?

a) $m\angle 1 = 90^\circ$

b) $m\angle 2 = 38^\circ$

You Try! Find the measure of each numbered angle in the diagram to the right.

- a) $m\angle 1 = 90^\circ$
- b) $m\angle 2 = 110^\circ$
- c) $m\angle 3 = 90^\circ$
- d) $m\angle 4 = 70^\circ$

Tangent Chord Angle Theorem: An angle formed by an intersecting tangent and chord has its vertex "on" the circle.

The tangent chord angle is half the measure of the intercepted arc.

Tangent Chord Angle = $\frac{1}{2}$ (Intercepted Arc)

$m\angle C = \frac{1}{2}m\widehat{BD}$

Example 4: In the diagram, \overline{SR} is tangent to the circle at Q. If $m\widehat{PMQ} = 212$, what is the $m\angle PQR$?

$\frac{360}{2} - \frac{212}{2} = 148$

$\frac{148}{2} = 74^\circ$

You Try! In the diagram, \overline{KI} is tangent to $\odot O$. What are the values of x and y?

$y = 55^\circ$

$x = 35^\circ$

Practice: Find the value of each variable. For each circle, the dot represents the center.

1. $a = 218^\circ$, $b = 109^\circ$

2. $\angle A = 58^\circ$

3. $m\widehat{AC} = 180^\circ$

4. $a = 48^\circ$, $b = 78^\circ$, $c = 96^\circ$, $d = 54^\circ$

5. $a = 112^\circ$, $b = 120^\circ$, $c = 38^\circ$

6. $x = 36^\circ$, $y = 36^\circ$