

Name:

Date:

Period: 5

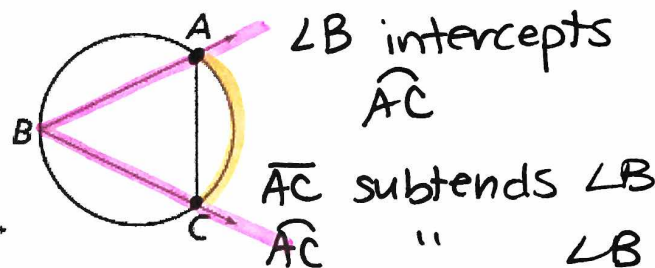
Inscribed Angles and Polygons in Circles

Lesson Objective **WBAT** find inscribed $\angle$ measures and intercepted arcs;

Inscribed Angle: an inscribed angle is an angle whose vertex is on a circle and whose sides are chords of the circle

Intercepted arc: An arc on a circle that lies between two lines, rays, or segments

If the endpoints of a chord or arc lie on the sides of the inscribed angle, then the chord or arc is said to "subtends" the angle



Exploration: Measures of Inscribed Angles

- Using the circle tool, create a circle of any size.
- Next, use the point tool to create two more points on the circle.
- Next, use the segment tool to create the INSCRIBED ANGLE ($\angle BCD$) and the CENTRAL ANGLE ($\angle BAD$)

STOP HERE BEFORE MOVING ON

- Now use the angle measure tool to find $m\angle BCD$ and $m\angle BAD$. What do you notice about these measures?

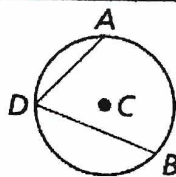
~~95~~ 46° 92°

- Move points around to change the size of your circle and/or inscribed and central angles. Does your observation from #4 still hold?

central $\angle$ is $2 \times$ inscribed $\angle$

Measure of an Inscribed Angle Theorem

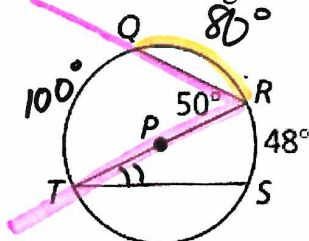
The measure of an inscribed angle is half the measure of its intercepted arc/central $\angle$



$$m\angle ADB = \frac{1}{2} m\widehat{AB}$$

Examples:

- Given the diagram...

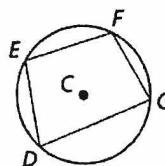


a. Find $m\angle T$ 24°

b. Find $m\widehat{QR}$ 80°

Inscribed Quadrilateral Theorem

A quadrilateral can be inscribed in a circle if and only if its opposite angles are supplementary.

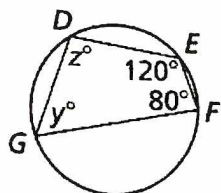


$$m\angle D + m\angle F = 180$$

$$m\angle E + m\angle G = 180$$

Example:

5. Find the values of y and z in the diagram.

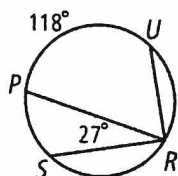


$$z = 100$$

$$y = 60$$

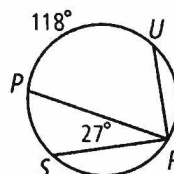
6. Find each measure.

- a. $m\angle PRU$



$$59^\circ$$

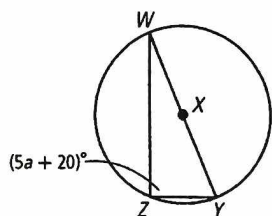
- b. $m\widehat{SP}$



$$54^\circ$$

7. Find each value.

- a. Find a .

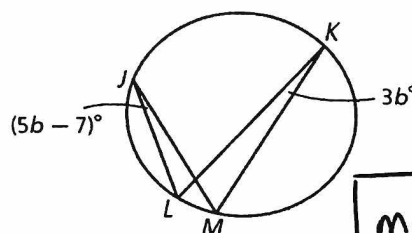


$$5a + 20 = 90$$

$$5a = 70$$

$$a = 14$$

- b. Find $m\angle LJM$

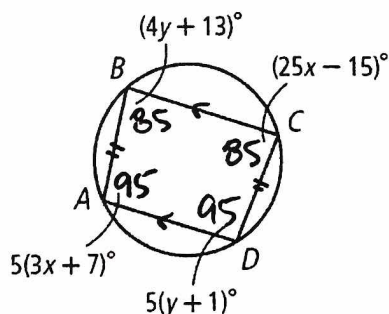


$$3b + 7 = 5b$$

$$b = 3.5$$

$$m\angle LJM = 10.5^\circ$$

8. Find $m\angle A$ and $m\angle B$.



$$4y + 13 + 5y + 5 = 180$$

$$9y = 162$$

$$y = 18$$

$$m\angle B = 85^\circ$$

$$15x + 35 + 25x - 15 = 180$$

$$40x = 160$$

$$x = 4$$

$$m\angle A = 95^\circ$$