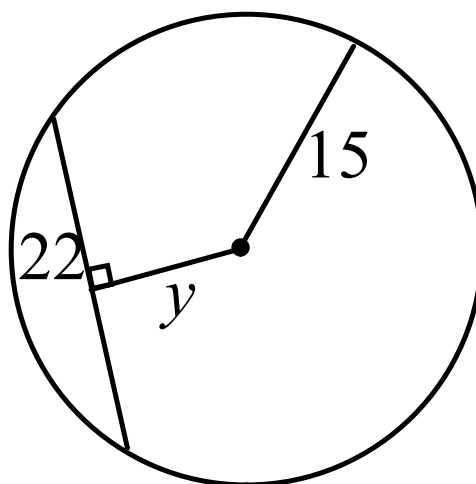


Warm Up:

Solve for y .



Learning Goal: Today I will learn about inscribed angles and intercepted arcs.

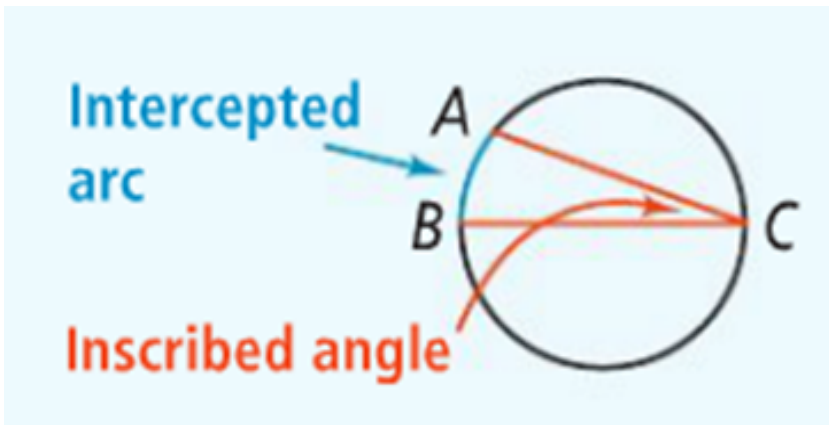
Success Criteria: I am able to solve for angles using the inscribed angles and intercepted arc properties.

12-3 Inscribed Angles

*Inscribed Angles

ys

An angle whose **vertex** lies on the circle and whose **sides** are **chords** of the circle.



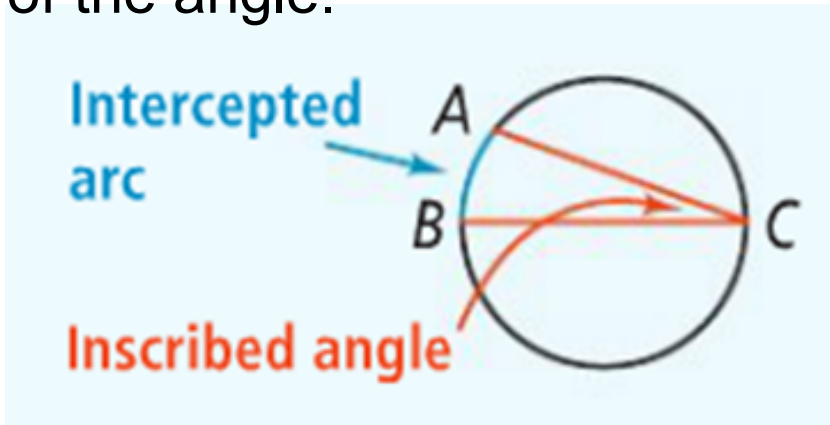
The perpendicular bisector of a chord goes through the center of the circle



*Intercepted Arc

ys

An arc with **endpoints** on the **side** of an inscribed angle and its other points in the **middle** of the angle.



The perpendicular bisector of a chord goes through the center of the circle



*Inscribed Angles

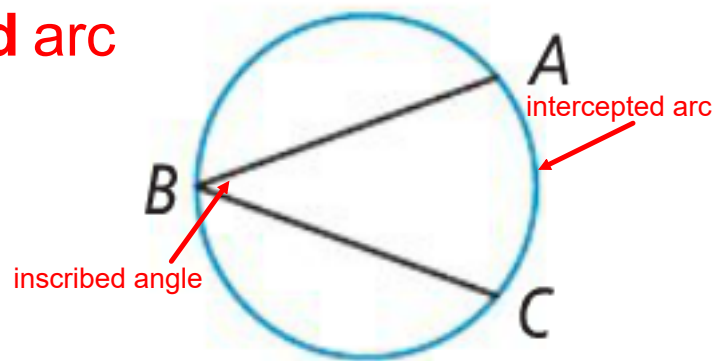
gs

Theorem 12-11

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

\widehat{AC} is the **intercepted arc**

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



The perpendicular bisector of a chord goes through the center of the circle

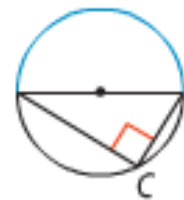


Corollaries to Theorem 12-11 The Inscribed Angle Theorem gs

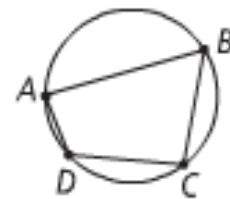
Corollary 1: Two inscribed angles that intercept the **same** arc are **congruent**.



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

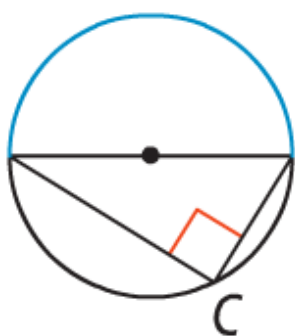


Corollary 3: The **opposite** angles of a **quadrilateral** (inscribed in a circle) are **supplementary**.



Inscribed Angles

Think about this:



Same arc = same inscribed angle

Inscribed angle of a semi-circle is
always 90°

Inscribed quadrilateral - opposite angles are
supplementary



Problem 1 Using the Inscribed Angle Theorem

What are the values of a and b ?

$$m\angle PQT = \frac{1}{2} m\widehat{PT}$$

Inscribed Angle Theorem

$$60 = \frac{1}{2} a$$

Substitute.

$$120 = a$$

Multiply each side by 2.

$$m\angle PRS = \frac{1}{2} m\widehat{PS}$$

Inscribed Angle Theorem

$$m\angle PRS = \frac{1}{2} (m\widehat{PT} + m\widehat{TS})$$

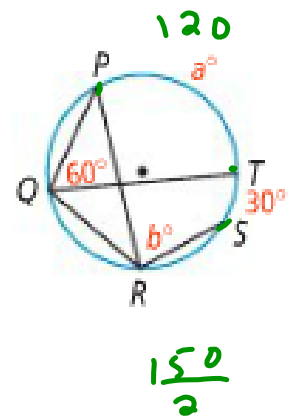
Arc Addition Postulate

$$b = \frac{1}{2} (120 + 30)$$

Substitute.

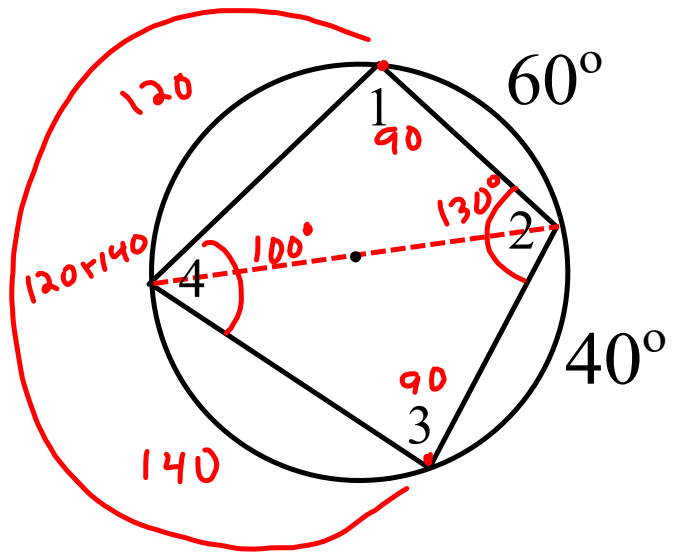
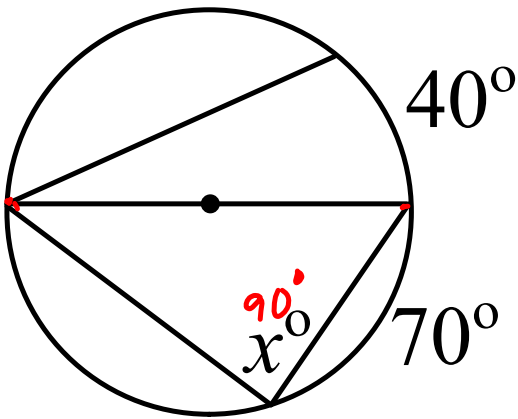
$$b = 75$$

Simplify.



Inscribed Angles

Find the missing angles:



Inscribed quadrilateral - opposite angles are supplementary

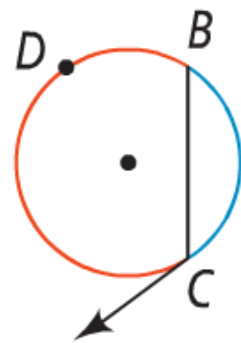
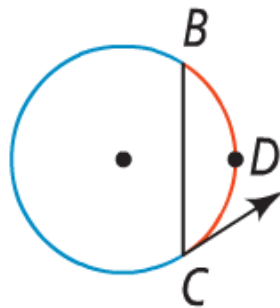
*Inscribed Angles

gs

Theorem 12-12

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

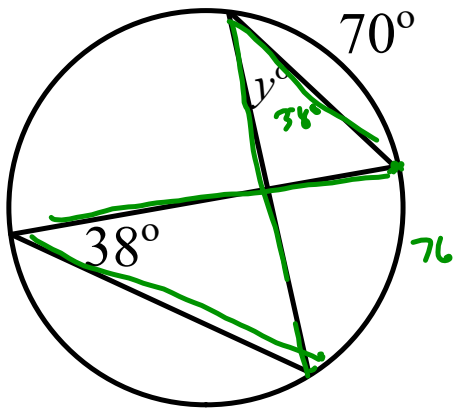
$$m\angle C = \frac{1}{2} m\widehat{BDC}$$



Inscribed quadrilateral - opposite angles are supplementary

Inscribed Angles

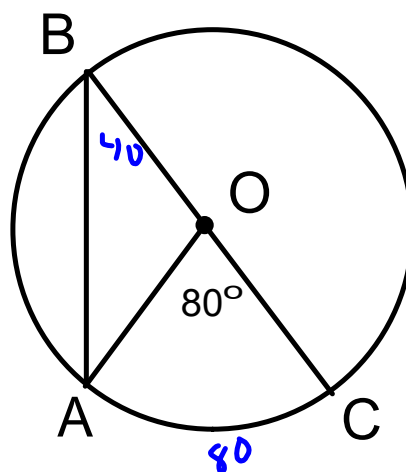
Find the values of the variables.



Inscribed quadrilateral - opposite angles are supplementary

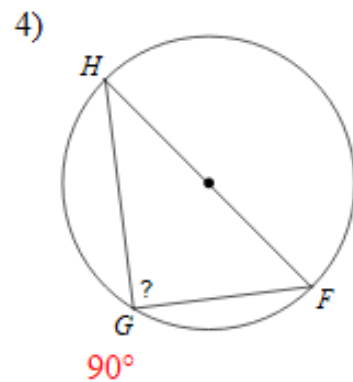
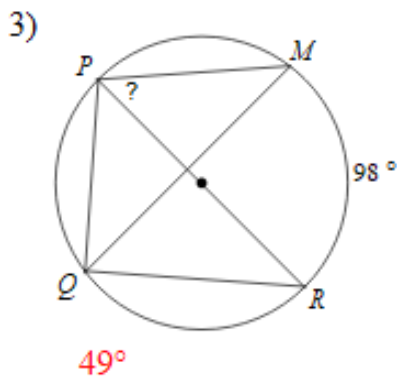
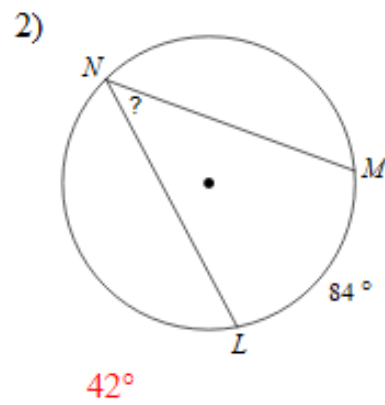
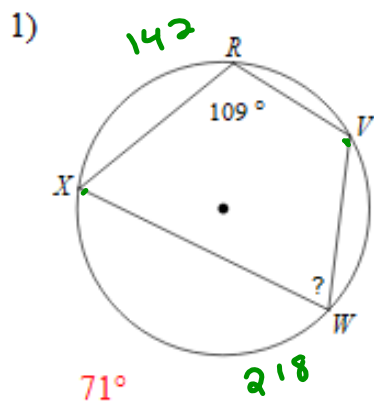
Inscribed Angles

1. What is $m\widehat{AC}$?
2. What is $m\angle B$?

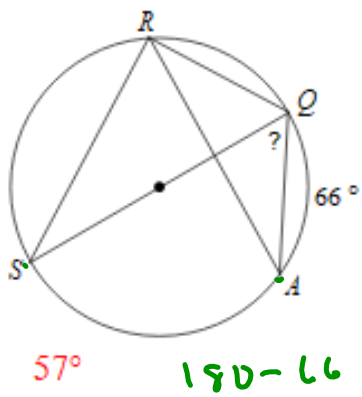


Closure: Today I learned the properties of inscribed angles and intercepted arcs.

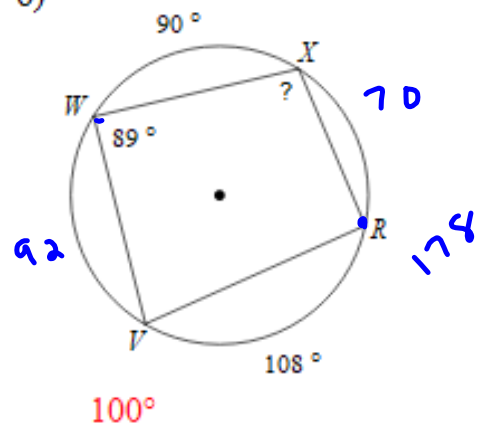
Find the measure of the arc or angle indicated.



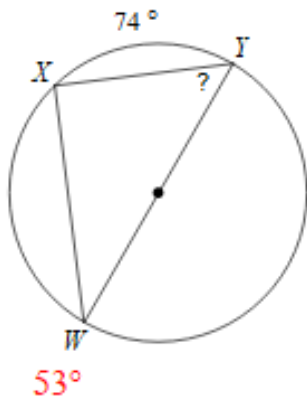
5)



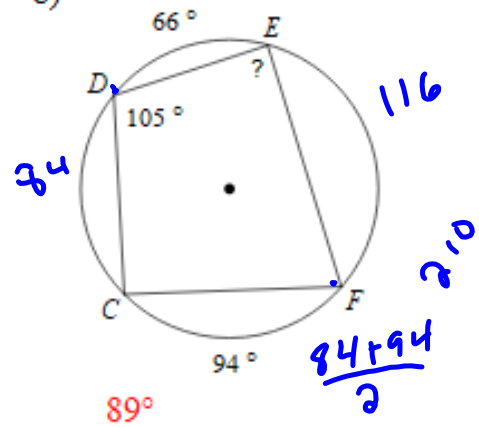
6)



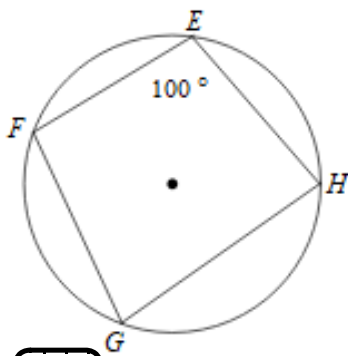
7)



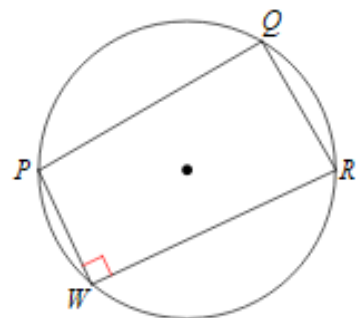
8)



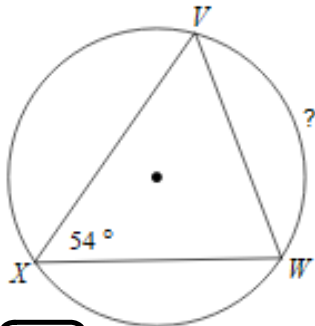
9) Find $m\widehat{HGF}$



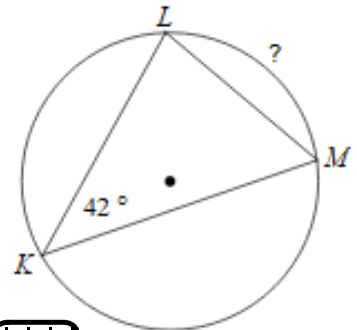
10) Find $m\widehat{PQR}$



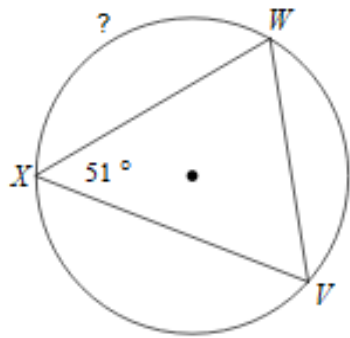
11)



12)



13)



138°



14)

