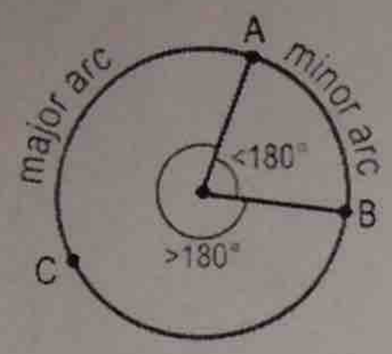
Math 3

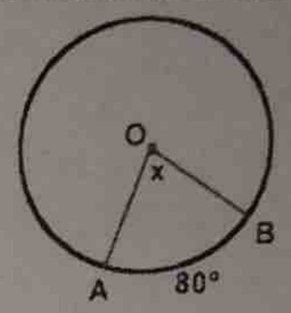
8.3 Inscribed Angles

Unit 8

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 ⊙P at the right. For parts d-f, find the measure of each arc in ⊙P.

a) A semicircle

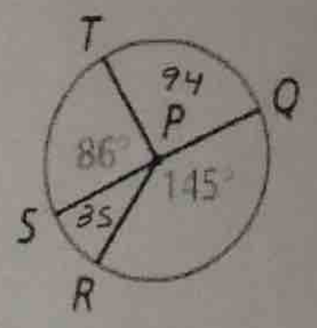
$\overset{\frown}{STQ}$

b) A minor arc

$\overset{\frown}{SR}$

c) A major arc

$\overset{\frown}{RTQ}$



d) $\overset{\frown}{ST}$

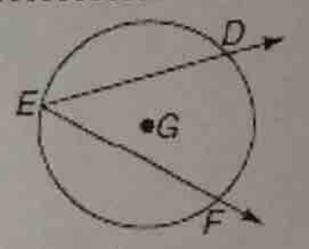
86°

e) $\overset{\frown}{STQ}$

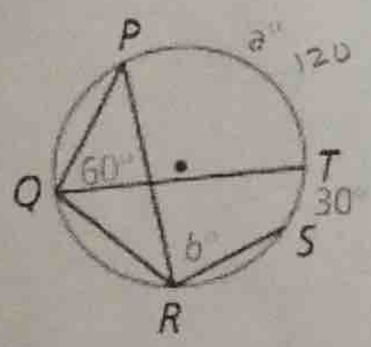
180°

f) $\overset{\frown}{RT}$

121°

Inscribed Angle:	An inscribed angle is an angle with its vertex "on" the circle, formed by two intersecting chords.	 $m\angle DEF = \frac{1}{2}m\overset{\frown}{DF}$
Inscribed Angle Theorem:	*The measure of an inscribed angle is half the measure of its intercepted arc.*	

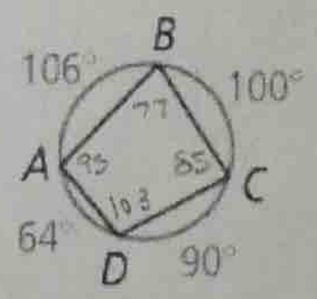
Example 2: What are the values of a and b?



$a = 120°$

$b = \frac{150}{2} = 75°$

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

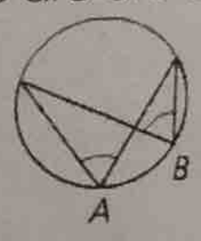
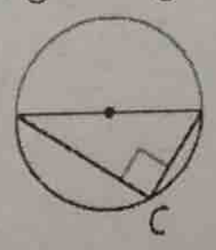
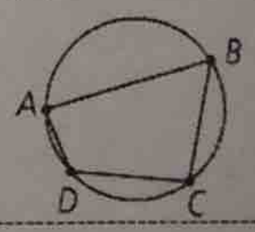


$\measuredangle A = 95°$

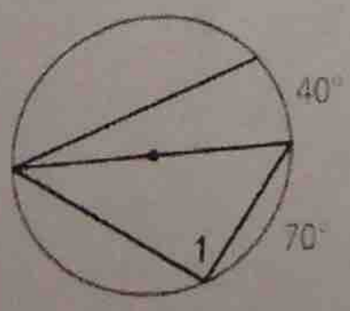
$\measuredangle B = 77°$

$\measuredangle C = 85°$

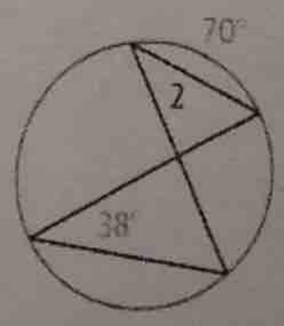
$\measuredangle D = 103°$

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) 

$\measuredangle 1 = 90°$

b) 

$\measuredangle 2 = 38°$

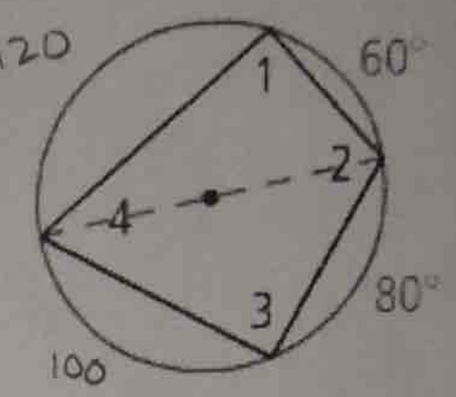
You Try! Find the measure of each numbered angle in the diagram to the right.

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

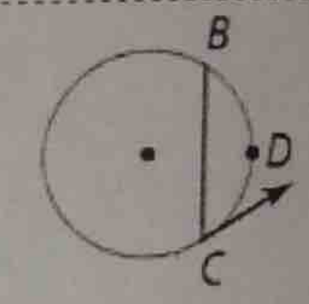
b) $m\angle 2 = 110^\circ$

c) $m\angle 3 = 90^\circ$

d) $m\angle 4 = 70^\circ$

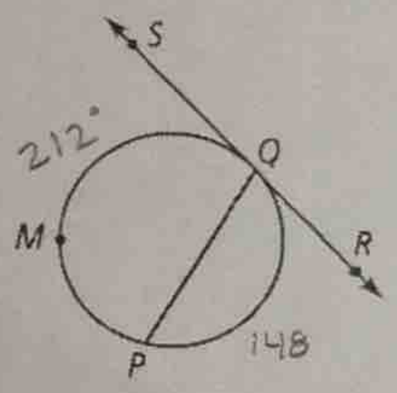


Tangent Chord Angle:	An angle formed by an intersecting tangent and chord has its vertex "on" the circle.
Tangent Chord Angle Theorem:	*The tangent chord angle is half the measure of the intercepted arc.* **Tangent Chord Angle = ½ (Intercepted Arc)**



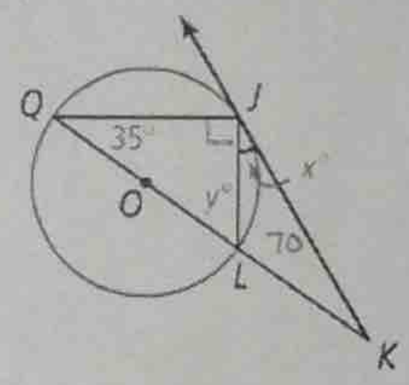
$m\angle C = \frac{1}{2} m\widehat{BDC}$

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



$m\angle PQR = 74^\circ$

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

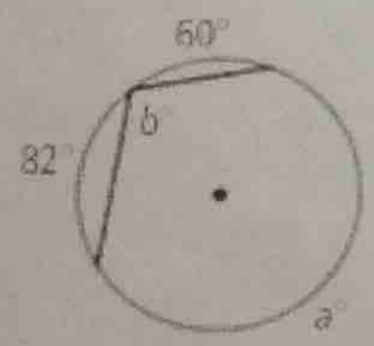


$y = 55^\circ$

$x = 35^\circ$

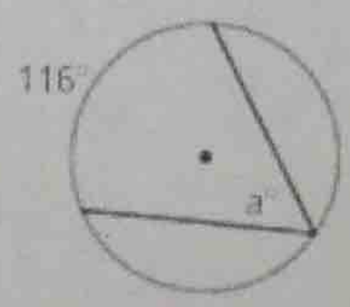
Practice: Find the value of each variable. For each circle, the dot represents the center.

1.



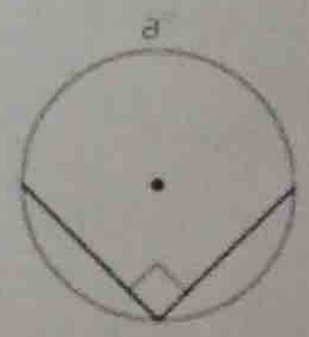
$a = 218$ $b = 109^\circ$

2.



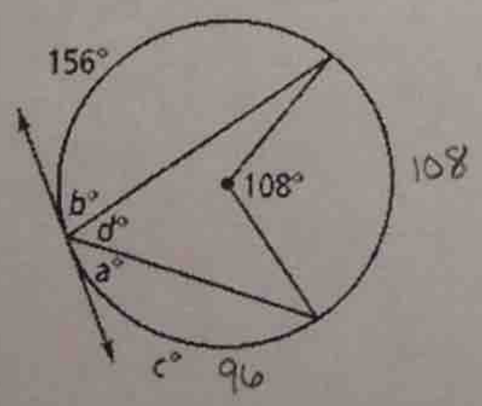
$a = 58^\circ$

3.



$a = 180^\circ$

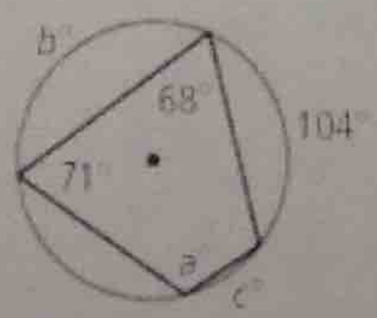
4.



$a = 48^\circ$ $c = 96^\circ$

$b = 78^\circ$ $d = 54^\circ$

5.

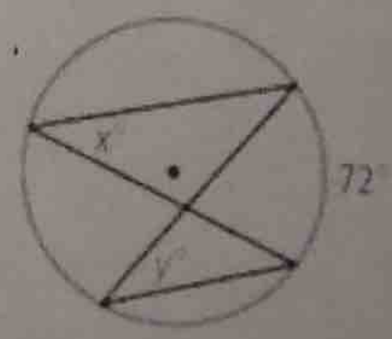


$a = 112^\circ$

$b = 120^\circ$

$c = 38^\circ$

6.



$x = 36^\circ$

$y = 36^\circ$