

### 6.3 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 $180^\circ$ .	An arc of a circle measuring less than $180^\circ$ .	An arc of a circle measuring $180^\circ$ .

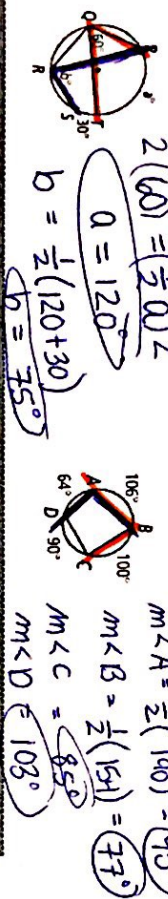
Central Angle Theorem:	In a circle, or congruent circles, congruent central angles have congruent arcs.	Corollary 1 = ARC
Diagram:		

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

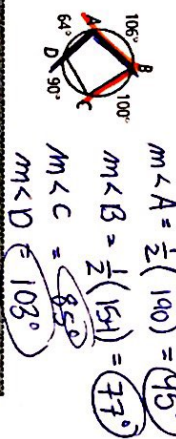
- a) A semicircle  $\widehat{QTS}$
  - b) A minor arc  $\widehat{TS}$
  - c) A major arc  $\widehat{TRQ}$
  - d)  $m\widehat{S}$   $86^\circ$
  - e)  $m\widehat{TRQ}$   $180^\circ$
  - f)  $m\widehat{RT}$   $35^\circ$
- 1)  $m\widehat{RT} = 180 - 145 = 35$   
 $35 + 86 = 121^\circ$

Inscribed Angle Theorem:	An inscribed angle is an angle with its vertex on the circle formed by two intersecting chords.	Diagram:
Inscribed Angle Theorem:	The measure of an inscribed angle is half the measure of its intercepted arc.	Diagram:

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



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

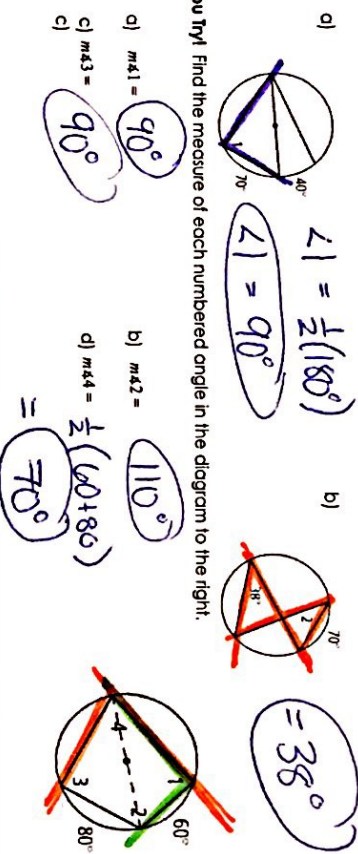


Corollary 1:	Two inscribed angles that intercept the same arc are congruent.	Diagram:
Corollary 2:	An angle inscribed in a semicircle is a right angle.	Diagram:
Corollary 3:	The opposite angles of a quadrilateral inscribed in a circle are supplementary.	Diagram:

\* Angles line up with same arc have same measure

$\angle B$  and  $\angle D$   
 $\angle A$  and  $\angle C$   
 will add to  $180^\circ$

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

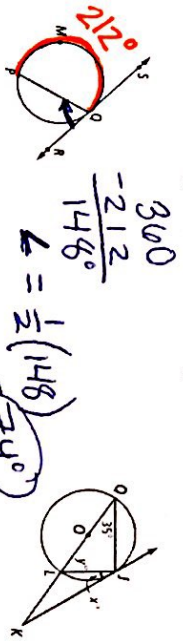


You Try! Find the measure of each numbered angle in the diagram to the right.

Tangent Chord Angle Theorem:	An angle formed by an intersecting tangent and chord has its vertex on the circle.	Diagram:
Tangent Chord Angle Theorem:	The tangent chord angle is half the measure of the intercepted arc.	Diagram:

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

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



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



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

- Diagram 1:  $82^\circ$ ,  $60^\circ$ ,  $a^\circ$
- Diagram 2:  $116^\circ$ ,  $a^\circ$
- Diagram 3:  $a^\circ$
- Diagram 4:  $155^\circ$ ,  $108^\circ$ ,  $a^\circ$
- Diagram 5:  $71^\circ$ ,  $68^\circ$ ,  $104^\circ$ ,  $b^\circ$ ,  $c^\circ$
- Diagram 6:  $72^\circ$