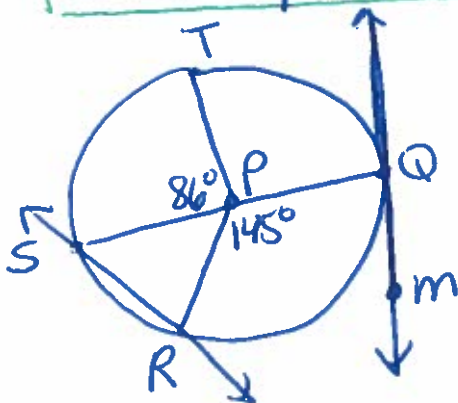


12-3 Inscribed Angles

Identify the following:

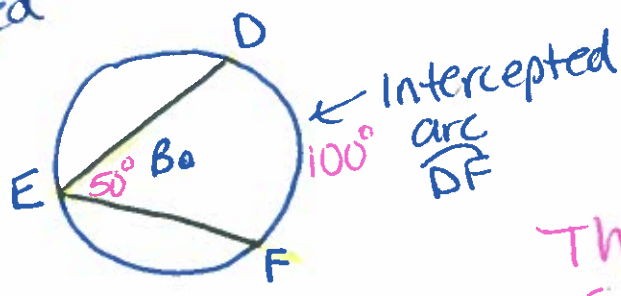
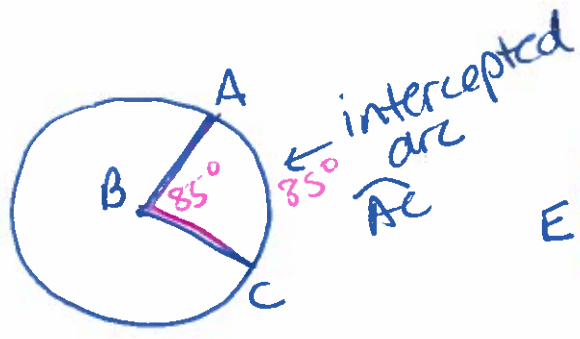


1. a semicircle $\widehat{STQ}, \widehat{SRQ}$
2. a minor arc $\widehat{ST}, \widehat{TQ}, \widehat{RS}, \widehat{RQ}$
3. a major arc $\widehat{SQR}, \widehat{RTQ}$
4. a central \angle (vertex must be P) $\angle SPT, \angle TPQ, \angle SPR$
5. a tangent line \overleftrightarrow{QM}
6. a secant line \overleftrightarrow{SR}
7. point of tangency Q

Find the measure of each arc in $\odot P$.

8. \widehat{ST} 86°
 9. \widehat{STQ} 180°

10. \widehat{RST} $35^\circ + 86^\circ = 121^\circ$
 11. \widehat{TQ} 94°
 $180 - 86$



central \angle is $\angle ABC$ (vertex is at the center of the circle).

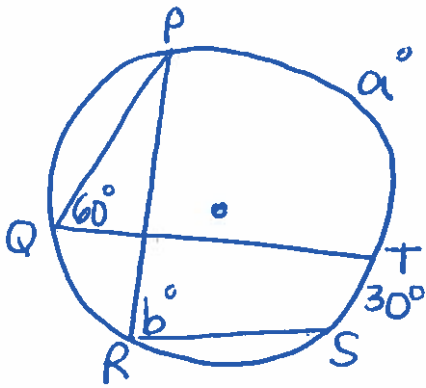
Inscribed \angle has its vertex and endpoints on the circle.

Thm 12-9 says that the measure of an inscribed \angle is equal to half the measure of the intercepted arc.

Central $\angle =$ intercepted arc

inscribed $\angle = \frac{1}{2}$ int. arc

EX.#1.



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

$$\Rightarrow 60^\circ = \frac{1}{2} a \cdot \frac{2}{1} \text{ (multiply by the reciprocal)}$$

$$\boxed{120 = a}$$

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

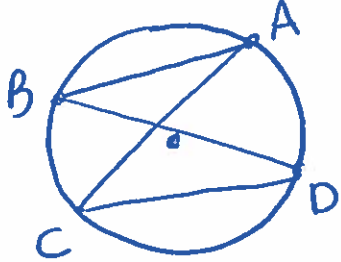
$$b = \frac{1}{2} (m\widehat{PT} + m\widehat{TS})$$

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

$$= \frac{1}{2} (150)$$

$$\boxed{b = 75^\circ}$$

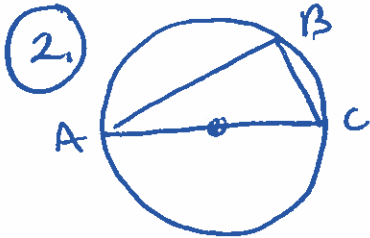
Corollaries to the Inscribed \angle Thm



①

$\angle ABD + \angle ACD$ are both inscribed \angle 's with an intercepted arc of \widehat{AD} , so both angles are \cong .

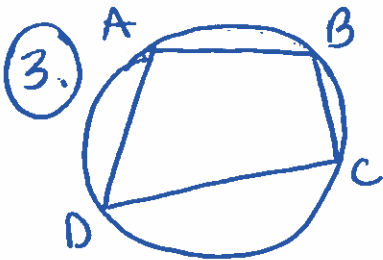
IF $m\widehat{AD} = 70^\circ$, then $m\angle ABD = 35^\circ = m\angle ACD$.



②

Any inscribed angle in a semicircle is 90° , (IF the endpoints of the \angle are the endpoints of the diameter.)

$$m\angle ABC = 90^\circ$$

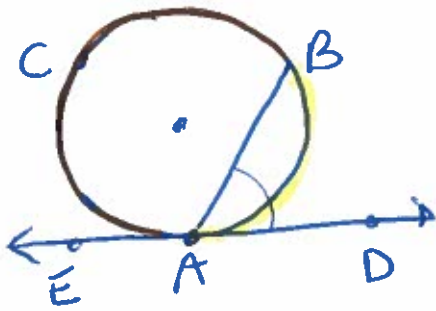


③

The opposite \angle 's of a quadrilateral inscribed in a circle are supplementary

$$m\angle A + m\angle C = 180^\circ$$

$$m\angle B + m\angle D = 180^\circ$$



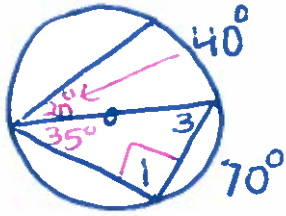
double angle to get arc
 $m\angle BAD = 50^\circ$, $\widehat{AB} = 100^\circ$
 $m\angle EAB = 130^\circ$, so $m\widehat{BCA} = 260^\circ$

the arcs add up to 360

$$\frac{130}{50}$$

the L's form a straight line = 180

(ex) Find $m\angle 1 + m\angle 3$.

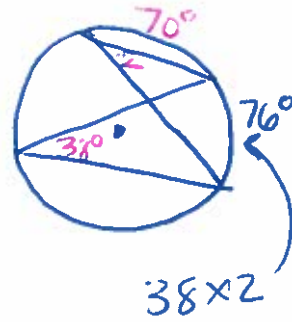


$$m\angle 1 = 90^\circ$$

$$m\angle 3 = 180 - 90 - 35$$

$$m\angle 3 = 55^\circ$$

(ex)



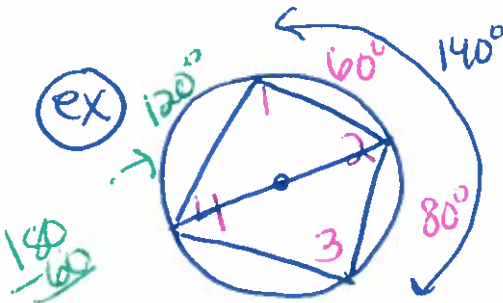
Find $m\angle 2$

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

Both intercept the same arc so the inscribed L's are \cong .

$$38 \times 2$$

(ex)



$$m\angle 4 = \frac{1}{2} \cdot 140^\circ = 70^\circ$$

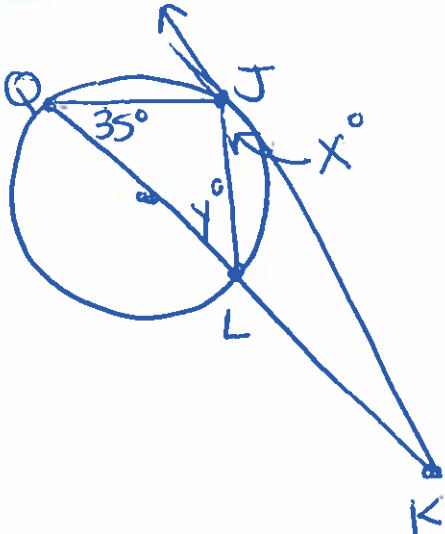
$$m\angle 2 = 180 - 70 = 110^\circ$$

(Both $\angle 2 + 4$ add up to 180)

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

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

(ex)



$$X = \frac{1}{2} m\widehat{JL}$$

$$= \frac{1}{2} m\angle Q$$

$$X = 35^\circ$$

$$Y = \frac{1}{2} m\widehat{QJ}$$

$$Y = \frac{1}{2} (m\widehat{QL} - m\widehat{JL})$$

$$= \frac{1}{2} (180 - 70)$$

$$Y = 55^\circ$$