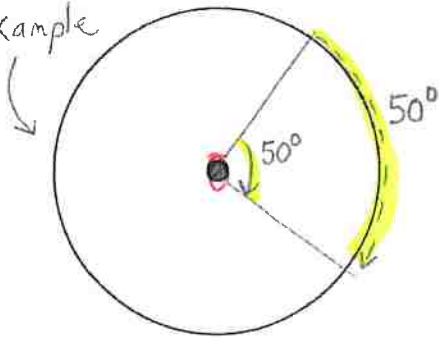


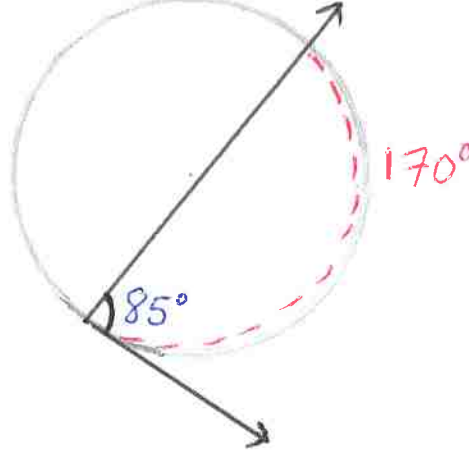
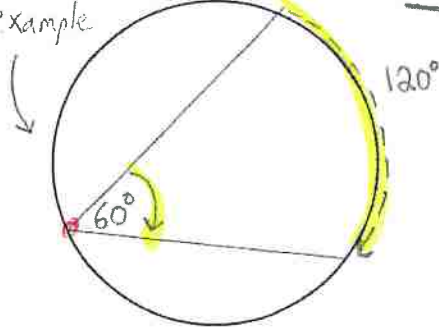
Central Angle \*central angle is equal to the arc between the endpoints

example

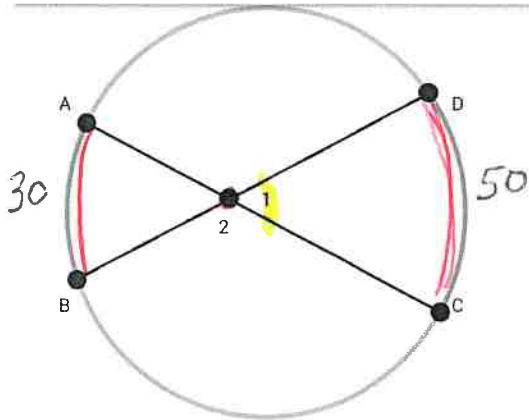


Inscribed Angle \*inscribed angle is half the measure of the arc between endpoints

example



Angle inside circle:



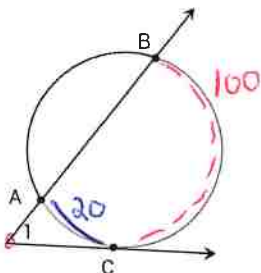
$$\angle 1 = \frac{1}{2} (\widehat{AB} + \widehat{CD})$$

$$\angle 2 = \frac{1}{2} (\widehat{AD} + \widehat{BC})$$

$$m\angle 1 = \frac{30 + 50}{2}$$

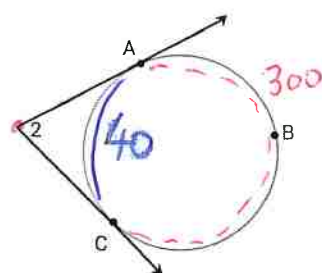
$$\text{angle} = \frac{\widehat{\text{arc 1}} + \widehat{\text{arc 2}}}{2}$$

Angle Outside circle:



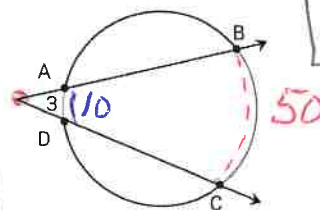
$$\angle 1 = \frac{1}{2} (\widehat{BC} - \widehat{AC})$$

$$m\angle 1 = \frac{100 - 20}{2}$$



$$\angle 2 = \frac{1}{2} (\widehat{ABC} - \widehat{AC})$$

$$m\angle 2 = \frac{300 - 40}{2}$$



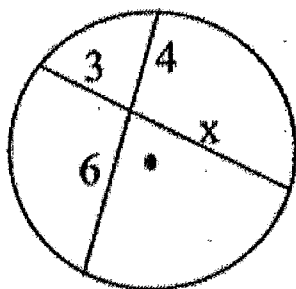
$$\angle 3 = \frac{1}{2} (\widehat{BC} - \widehat{AD})$$

$$m\angle 3 = \frac{50 - 10}{2}$$

$$\text{angle} = \frac{\widehat{\text{Big Arc}} - \widehat{\text{Smaller Arc}}}{2}$$

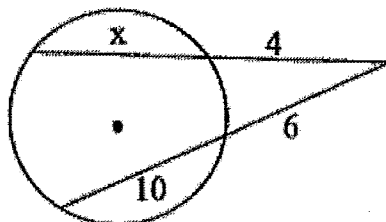
Chord segment lengths:

part \* part = part \* part



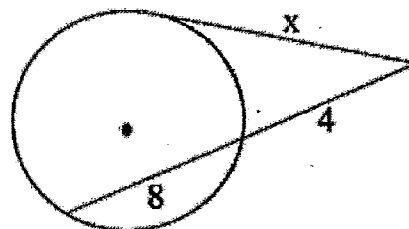
Secant segment lengths:

outside \* whole = outside \* whole



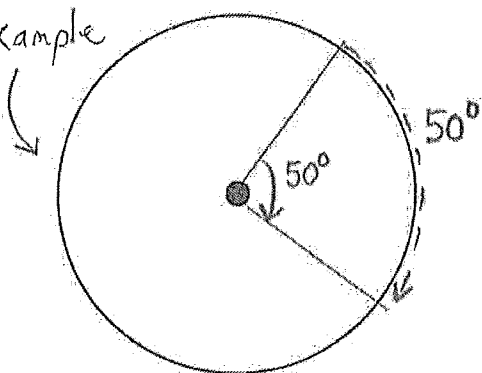
Secant/tangent segment lengths:

outside \* whole = outside \* whole



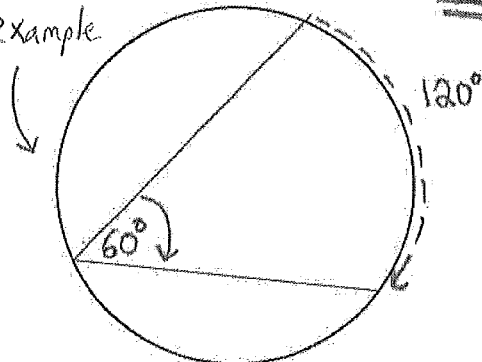
Central Angle \*central angle is equal to the arc between the endpoints

example

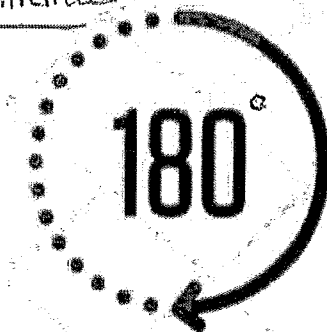


Inscribed Angle \*inscribed angle is half the measure of the arc between endpoints

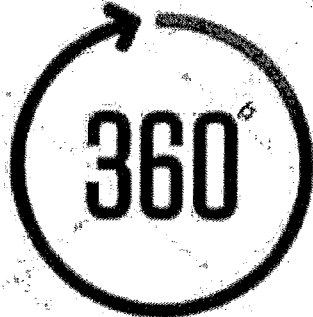
example



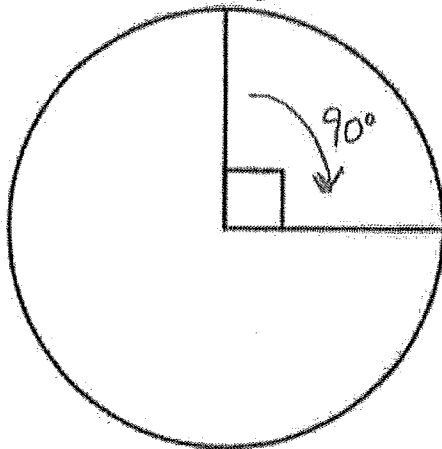
Semicircle



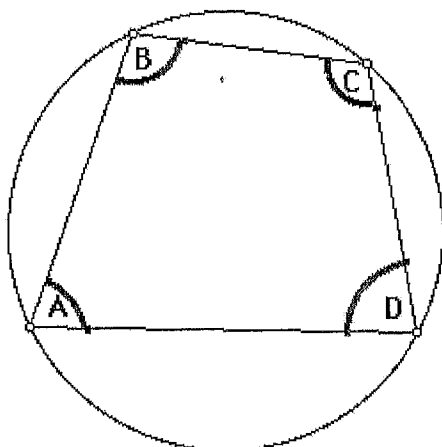
Full circle



90 degree central angle



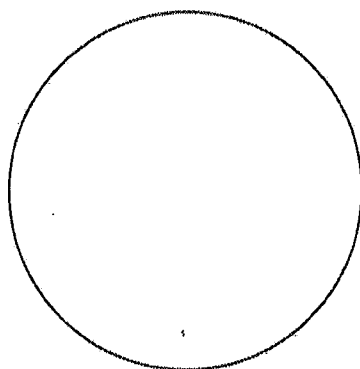
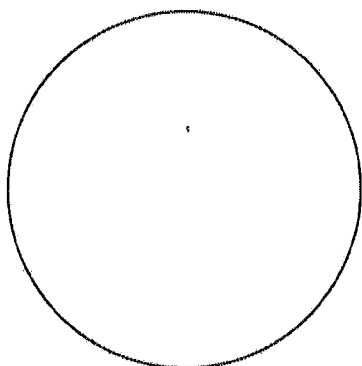
# Inscribed Quadrilateral



$$A + C = 180$$

$$B + D = 180$$

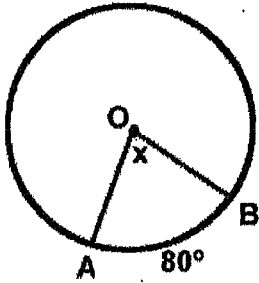
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Ch. 10 Circles Concept Review

Key

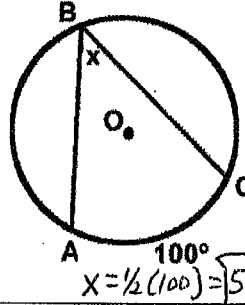
Central Angle:  $m\angle AOB = m\widehat{AB}$



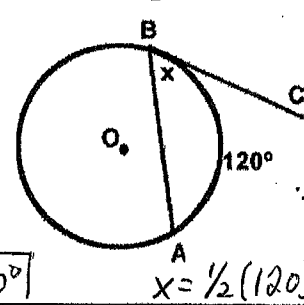
$$x = 80^\circ$$

Inscribed Angles:

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



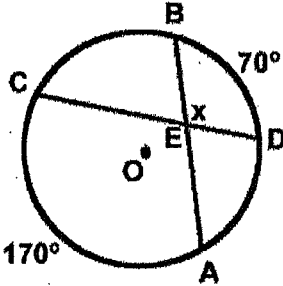
$$x = \frac{1}{2}(100) = 50^\circ$$



$$x = \frac{1}{2}(120) = 60^\circ$$

Intersecting Chords inside circle:

$$m\angle BED = \frac{1}{2} (m\widehat{BD} + m\widehat{AC})$$



$$x = \frac{1}{2} (70 + 170)$$

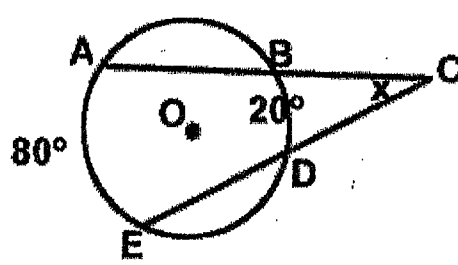
$$x = \frac{1}{2} (240)$$

$$x = 120^\circ$$

Angle outside circle formed by secants/tangents:

$$m\angle ACE = \frac{1}{2} (m\widehat{AE} - m\widehat{BD})$$

$$x = \frac{1}{2} (80 - 20)$$

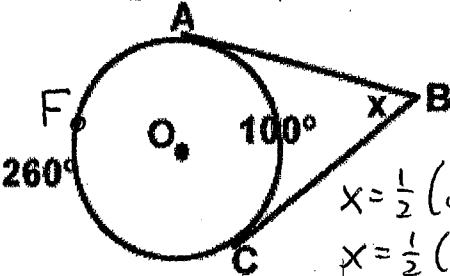


$$x = \frac{1}{2} (60)$$

$$x = 30^\circ$$

Angle outside circle formed by secants/tangents:

$$m\angle ABC = \frac{1}{2} (m\widehat{AFC} - m\widehat{AC})$$



$$x = \frac{1}{2} (260 - 100)$$

$$x = \frac{1}{2} (160)$$

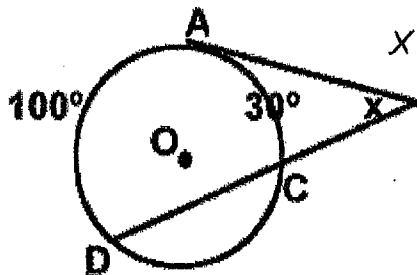
$$x = 80^\circ$$

Angle outside circle formed by secants/tangents:

$$m\angle ABD = \frac{1}{2} (m\widehat{AD} - m\widehat{AC})$$

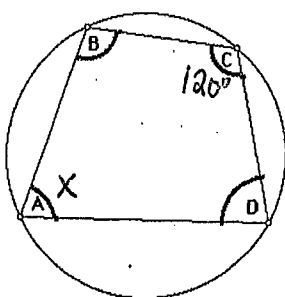
$$x = \frac{1}{2} (100 - 30)$$

$$x = \frac{1}{2} (70)$$



$$x = 35^\circ$$

Inscribed Quadrilateral Property:



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

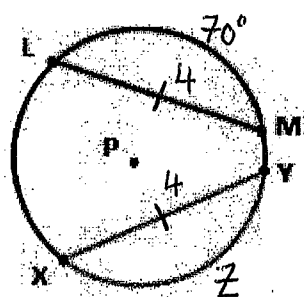
$$\angle A + 120 = 180$$

$$\angle A = 60^\circ$$

$$x = 60^\circ$$

$$\begin{aligned} A + C &= 180 \\ B + D &= 180 \end{aligned}$$

Congruent chords in circle:



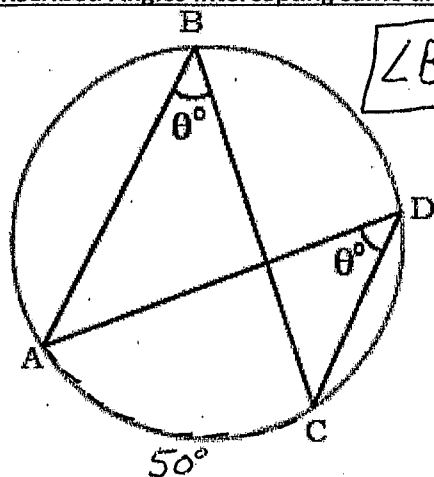
$$\widehat{LM} = \widehat{XY}$$

$$70 = z$$

$$z = 70^\circ$$

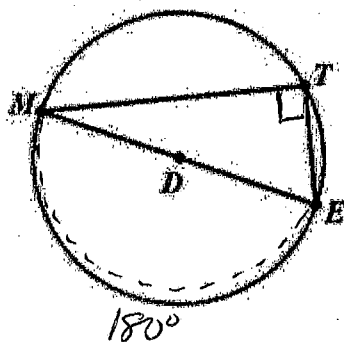
$$\overline{LM} \cong \overline{XY} \text{ and } \widehat{LM} \cong \widehat{XY}$$

Inscribed Angles intercepting same arc:



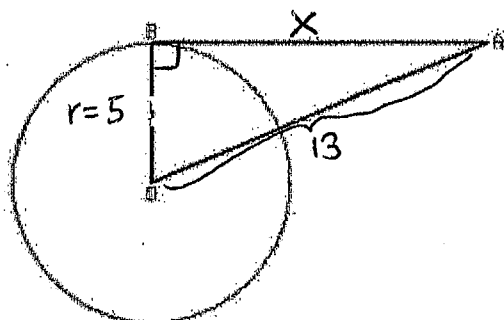
$$\angle B = \angle D = 50^\circ$$

Inscribed Angle Intercepting diameter:



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

Line tangent to circle is perpendicular to radius:

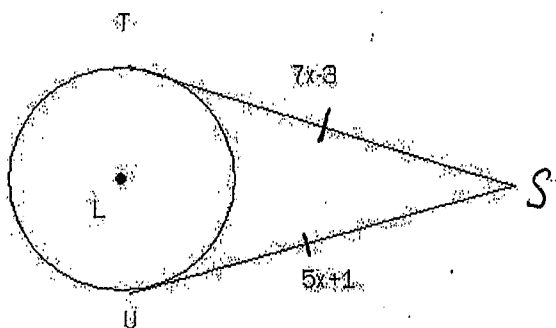


$$5^2 + x^2 = 13^2$$

$$x^2 = 13^2 - 5^2$$

$$x^2 = 144 \quad \boxed{x=12}$$

Tangents to circles are congruent: (party hat problems):



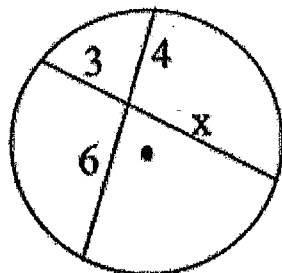
$$7x-3 = 5x+1$$

$$2x = 4$$

$$\boxed{x=2}$$

Chord segment lengths:

part \* part = part \* part



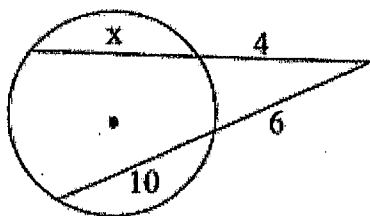
$$3x = 6(4)$$

$$3x = 24$$

$$\boxed{x=8}$$

Secant segment lengths:

outside \* whole = outside \* whole



$$4(x+4) = 6(10+6)$$

$$4x+16 = 6(16)$$

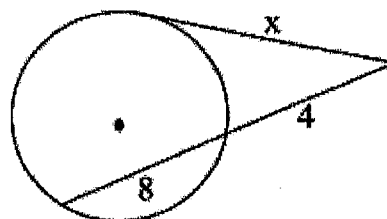
$$4x+16 = 96$$

$$4x = 80$$

$$\boxed{x=20}$$

Secant/tangent segment lengths:

outside \* whole = outside \* whole



$$x \cdot x = 4(4+8)$$

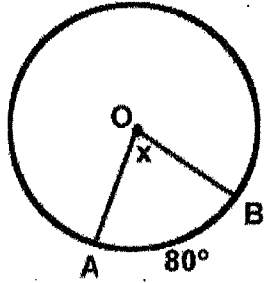
$$x^2 = 4(12)$$

$$x^2 = 48$$

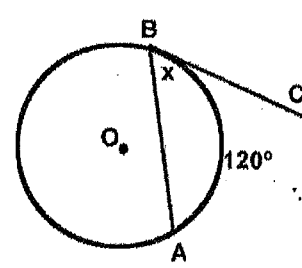
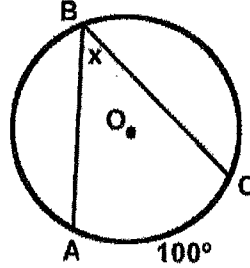
$$\boxed{x = \sqrt{48} = 4\sqrt{3} \approx 6.928}$$

**Ch. 10 Circles Concept Review**

**Central Angle:**  $m\angle AOB = m\widehat{AB}$

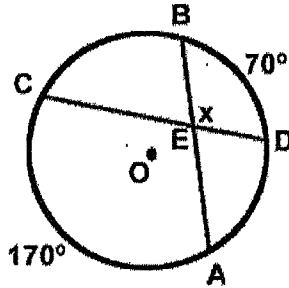


**Inscribed Angles:**  $m\angle ABC = \frac{1}{2}m\widehat{AC}$



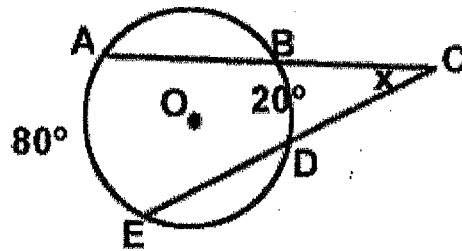
**Intersecting Chords inside circle:**

$$m\angle BED = \frac{1}{2}(m\widehat{BD} + m\widehat{AC})$$



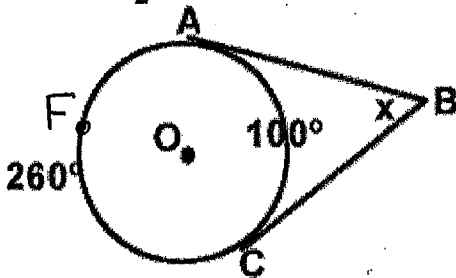
**Angle outside circle formed by secants/tangents:**

$$m\angle ACE = \frac{1}{2}(m\widehat{AE} - m\widehat{BD})$$



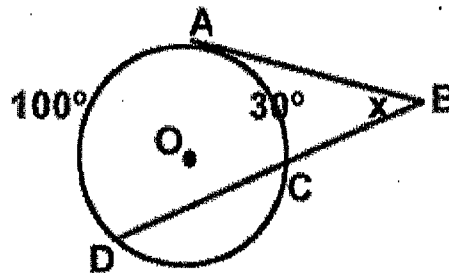
**Angle outside circle formed by secants/tangents:**

$$m\angle ABC = \frac{1}{2}(m\widehat{AFC} - m\widehat{AC})$$

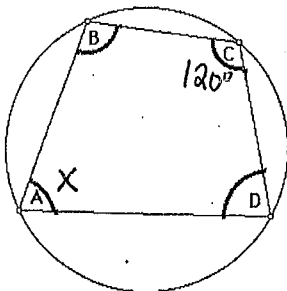


**Angle outside circle formed by secants/tangents:**

$$m\angle ABD = \frac{1}{2}(m\widehat{AD} - m\widehat{AC})$$

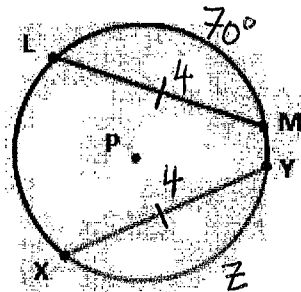


**Inscribed Quadrilateral Property:**



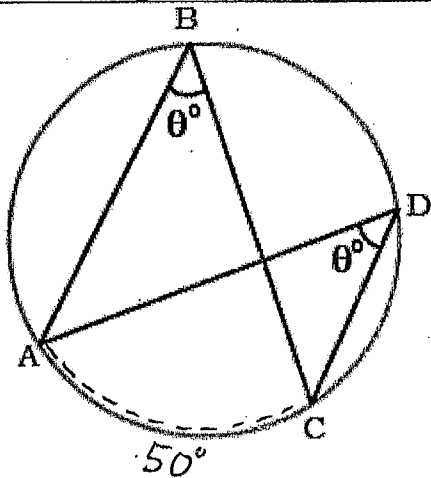
$$\begin{aligned} A + C &= 180 \\ B + D &= 180 \end{aligned}$$

**Congruent chords in circle:**

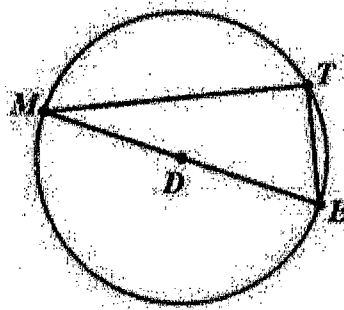


$$\overline{LM} \cong \overline{XY} \text{ and } \widehat{LM} \cong \widehat{XY}$$

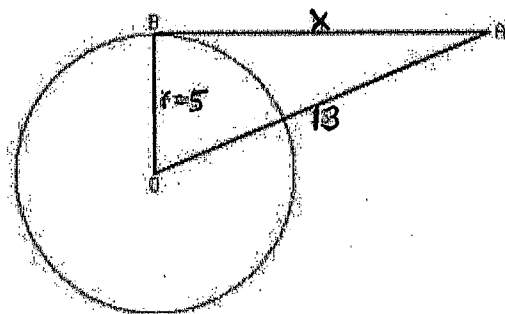
Inscribed Angles intercepting same arc:



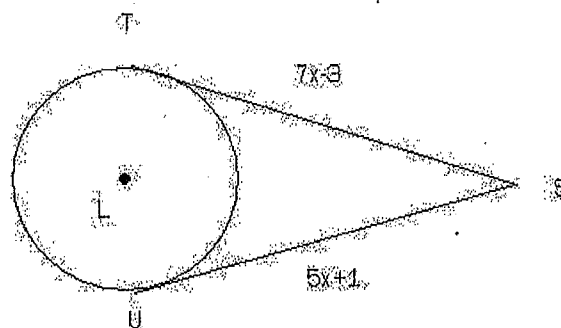
Inscribed Angle Intercepting diameter:



Line tangent to circle is perpendicular to radius:

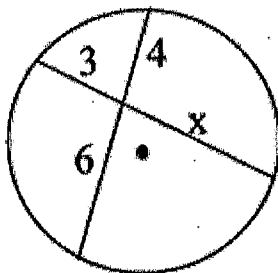


Tangents to circles are congruent: (party hat problems):



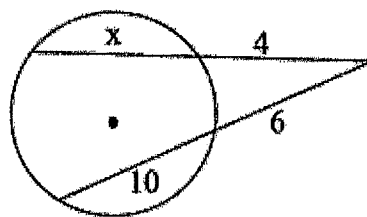
Chord segment lengths:

part \* part = part \* part



Secant segment lengths:

outside \* whole = outside \* whole



Secant/tangent segment lengths:

outside \* whole = outside \* whole

