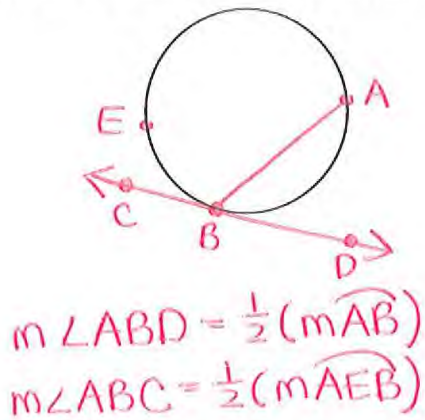
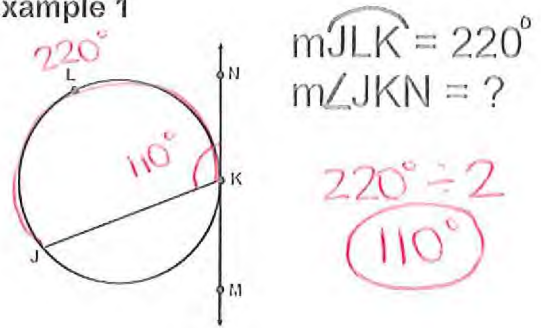


Angles Formed by Tangents, Secants and Chords

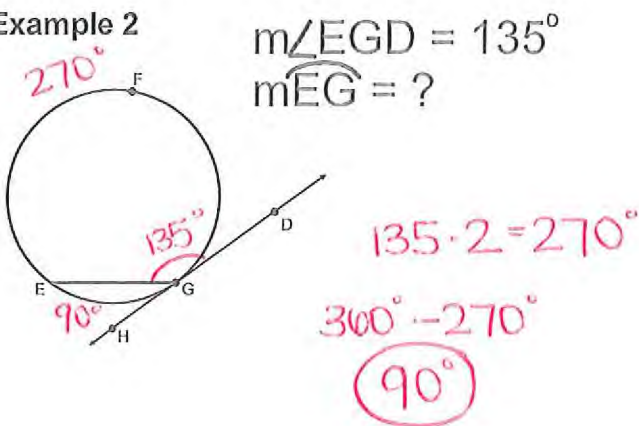
If a tangent and a chord intersect at a point on the circle, then the measure of the angle formed is one half the measure of its intercepted arc.



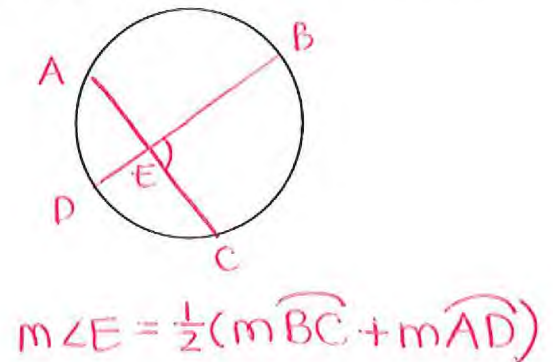
Example 1



Example 2

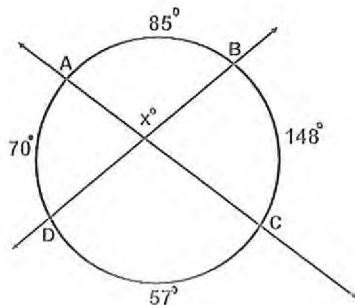


The measure of the angle formed when two chords or secants intersect inside a circle is equal to half the sum of the measures of its intercepted arcs.



Example 1

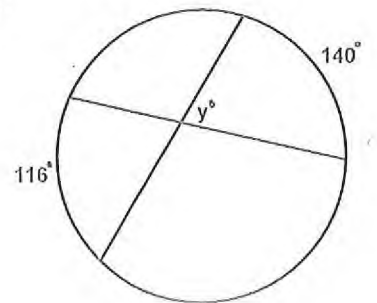
Find x.



$x = \frac{1}{2}(85 + 57)$
 $= \frac{1}{2}(142)$
 $= 71^\circ$

Example 2

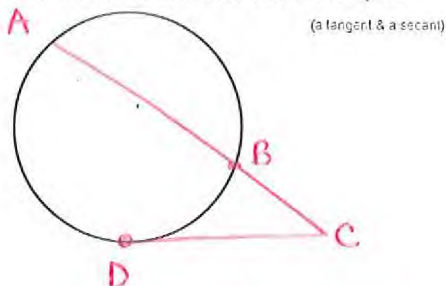
Find y.



$y = \frac{1}{2}(140 + 116)$
 $= \frac{1}{2}(256)$
 $= 128^\circ$

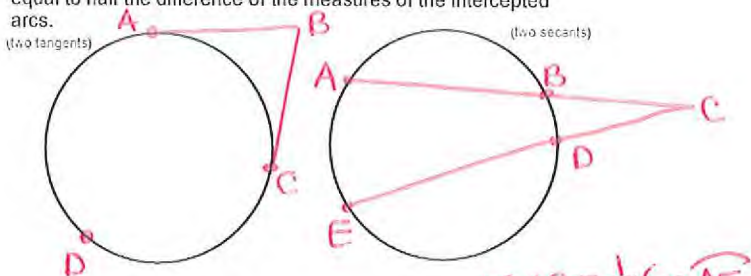
Angles Formed by Tangents, Secants and Chords

The measure of an angle formed by a tangent and a secant, two tangents, or two secants drawn from a point outside the circle is equal to half the difference of the measures of the intercepted arcs.



$$m\angle C = \frac{1}{2}(m\widehat{AD} - m\widehat{BD})$$

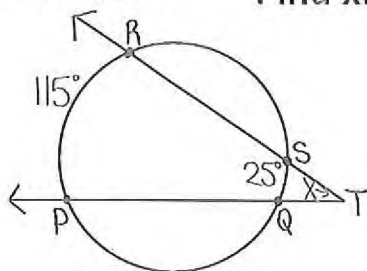
The measure of an angle formed by a tangent and a secant, two tangents, or two secants drawn from a point outside the circle is equal to half the difference of the measures of the intercepted arcs.



$$m\angle B = \frac{1}{2}(m\widehat{ADC} - m\widehat{AC})$$

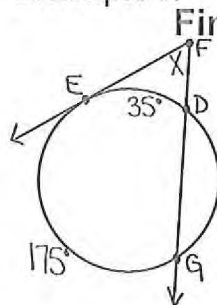
$$m\angle C = \frac{1}{2}(m\widehat{AE} - m\widehat{BD})$$

Example 1 Find x.



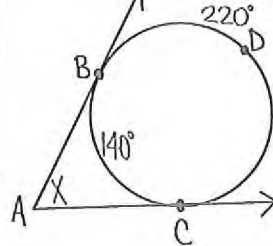
$$\begin{aligned} x &= \frac{1}{2}(115 - 25) \\ &= \frac{1}{2}(90) \\ &= \boxed{45} \end{aligned}$$

Example 2 Find x.



$$\begin{aligned} x &= \frac{1}{2}(175 - 35) \\ &= \frac{1}{2}(140) \\ &= \boxed{70} \end{aligned}$$

Example 3 Find x.



$$\begin{aligned} x &= \frac{1}{2}(220 - 140) \\ &= \frac{1}{2}(80) \\ &= \boxed{40} \end{aligned}$$

When the angle is formed INSIDE of the circle



$$\angle = \frac{1}{2}(n + n)$$

When the angle is formed OUTSIDE of the circle



$$\angle = \frac{1}{2}(N - n)$$