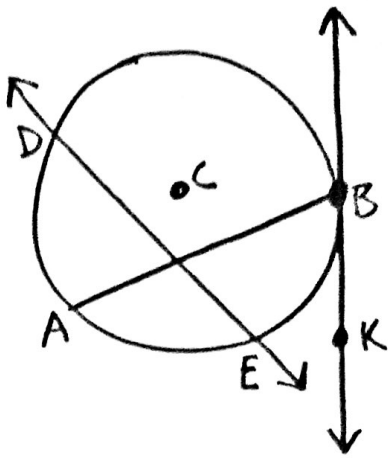
8.4 Secants, Tangents, Chords

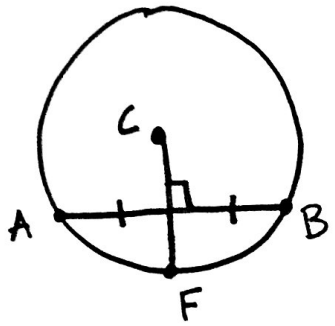


Chord - segment with endpoints on circle that does not go through center ex: $\overline{AB}$

Secant - line through circle ex: $\overleftrightarrow{DE}$

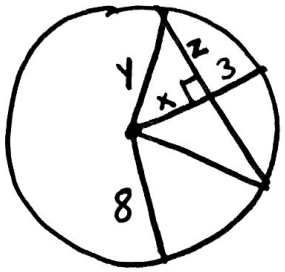
Tangent - line that has one point on the edge of the circle ex: $\overleftrightarrow{BK}$

ex:



If the radius is perpendicular to a chord, then the radius is a perpendicular bisector of that chord.

ex:



$x+3=8$

$\boxed{x=5}$

$\boxed{y=8}$ (radius)

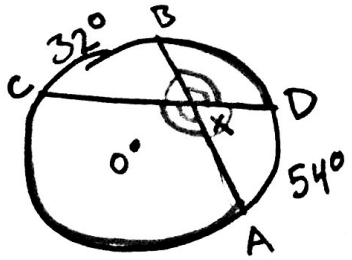
$64=25+z^2$

$\sqrt{39}=\sqrt{z^2}$

$\boxed{\sqrt{89}=z}$

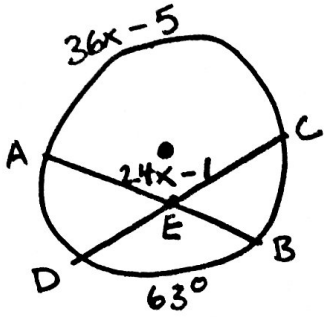
$5^2+z^2=8^2$

Two Chords: The angle formed by two chords is half the measure of their combined arcs



$x=\frac{32+54}{2}=\frac{86}{2}=\boxed{43^\circ}$

ex. Find $m\angle AEC$



$2(24x-1)=36x-5+63$

$48x-2=36x+58$

$12x=60$

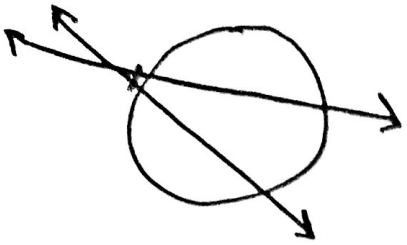
$x=5$

$24x-1=\frac{36x-5+63}{2}$

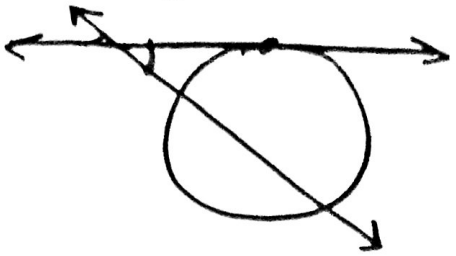
$m\angle AEC=24(5)-1$

$=\boxed{119^\circ}$

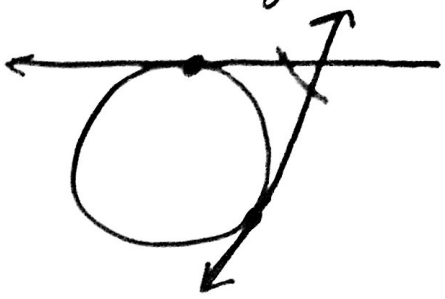
Two Secants



Tangent-Secant

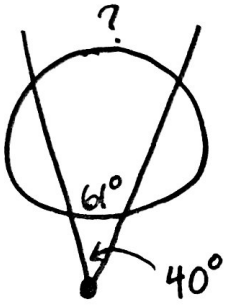


Two Tangents



Outside angle is half the diference of the intercepted arcs. $\text{Angle} = \frac{\text{Big arc} - \text{little arc}}{2}$

ex:

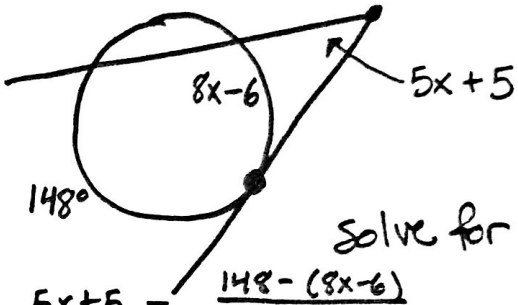


$40 = \frac{x - 61}{2}$

$80 = x - 61$

$\boxed{141^\circ} = x$

ex:



Solve for x.

$5x+5 = \frac{148 - (8x-6)}{2}$

$2(5x+5) = 148 - (8x-6)$

$10x + 10 = 148 - 8x + 6$

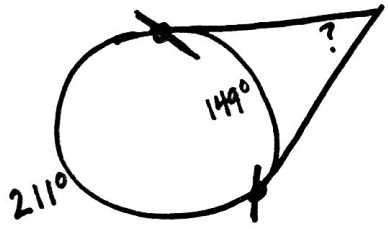
$10x + 10 = 154 - 8x$

$+8x \quad -10 \quad -10 \quad +8x$

$18x = 144$

$\boxed{x = 8}$

ex:



$\frac{211 - 149}{2} = \boxed{31^\circ}$

*Two tangents: arcs add to 360°

Tangent-Chord: The angle is half the measure of the intercepted arc.