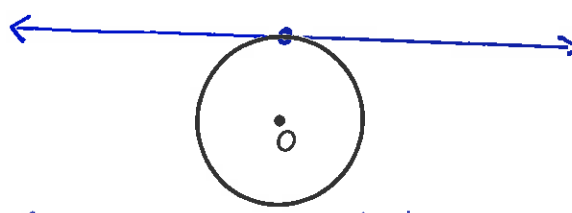
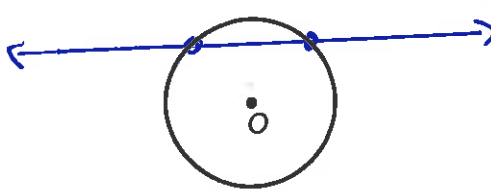
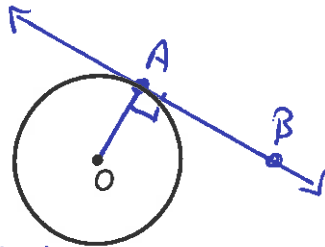


Angles Formed by Chords, Tangents & Secants

Vocabulary:

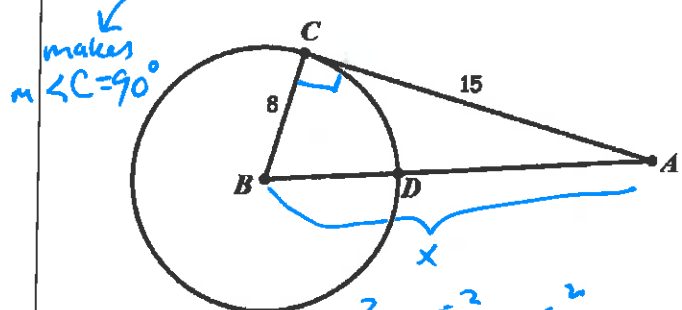
<p>Tangent</p>  <p>1 intersection point</p>	<p>Secant</p>  <p>2 intersection points.</p>
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Theorem: A tangent is perpendicular to the radius it is drawn to.



Tangent \overleftrightarrow{AB}
 $m\angle OAB = 90^\circ$

Example: Tangent \overline{AC} . Find AB.



makes $\angle C = 90^\circ$

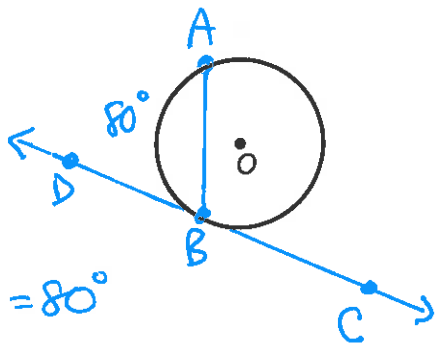
$$8^2 + 15^2 = x^2$$

$$64 + 225 = x^2$$

$$289 = x^2$$

$x = 17$

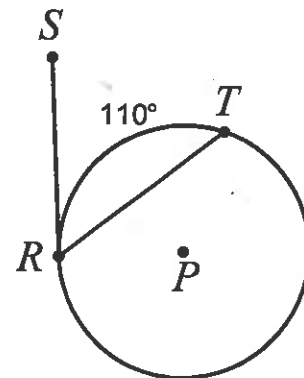
Theorem: The angle made by a tangent and chord is half the measure of the arc cut.



$$m\widehat{AB} = 80^\circ$$

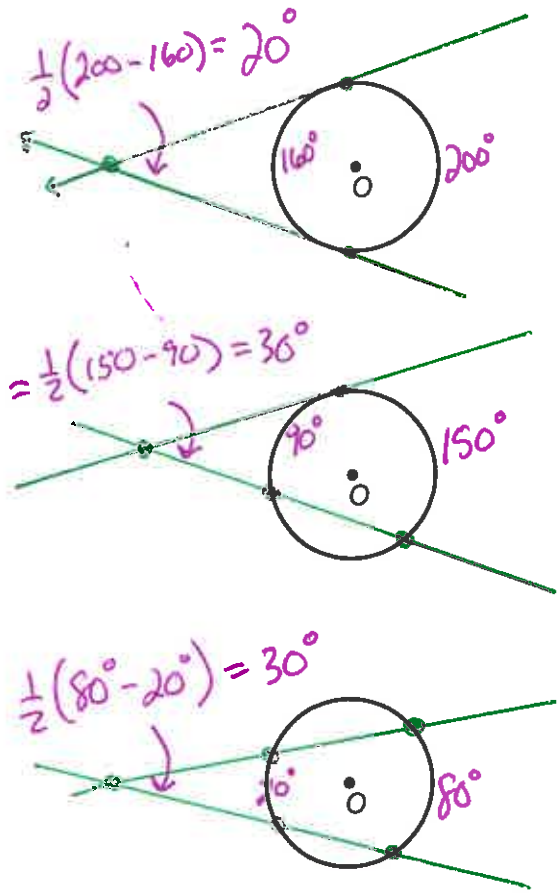
$$\Rightarrow m\angle ABC = 40^\circ$$

Example: $m\widehat{RT} = 110^\circ$. Find $m\angle SRT$

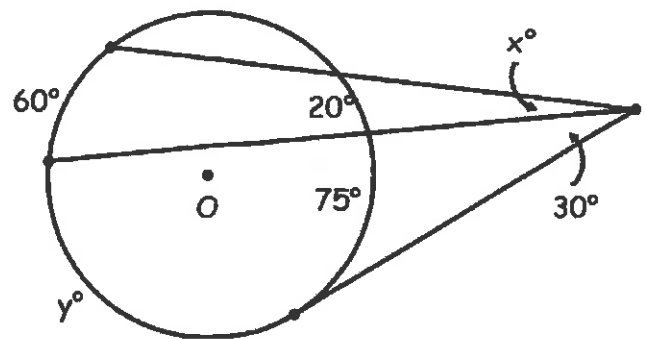


$$m\angle SRT = \frac{1}{2}(110) = 55^\circ$$

Theorem: The angle formed by two tangents or secants that intersect **outside** a circle = to **half the difference** of the arcs that are cut.



Example: Find x and y.



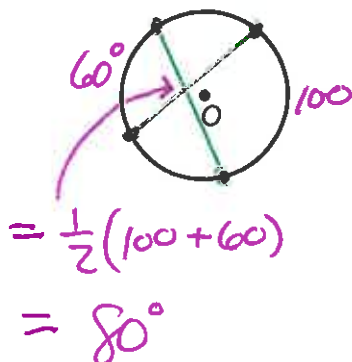
$$x = \frac{1}{2}(60 - 20) = 20^\circ$$

$$2(30) = y - 75$$

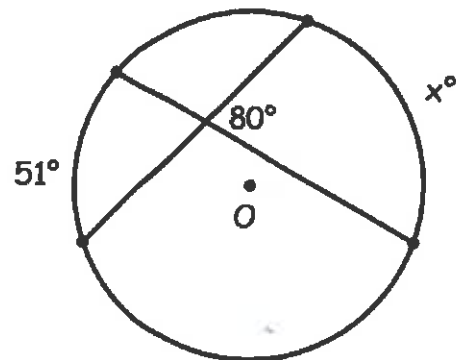
$$60 = y - 75$$

$$135 = y$$

Theorem: The angle formed by two chords that intersect **inside** a circle = **half the sum** of the arcs that are cut.



Example: Find x.

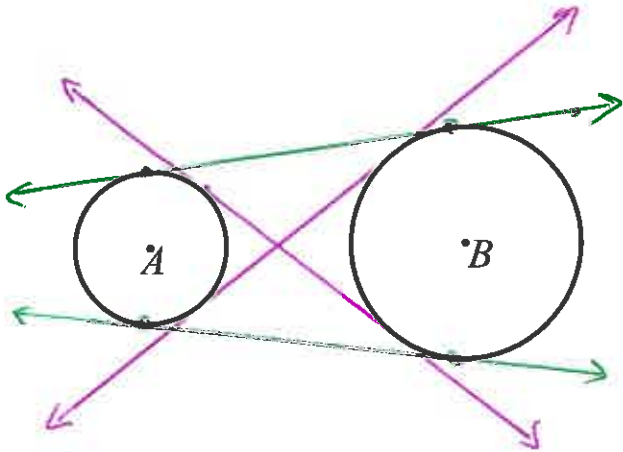


$$2(80) = x + 51$$

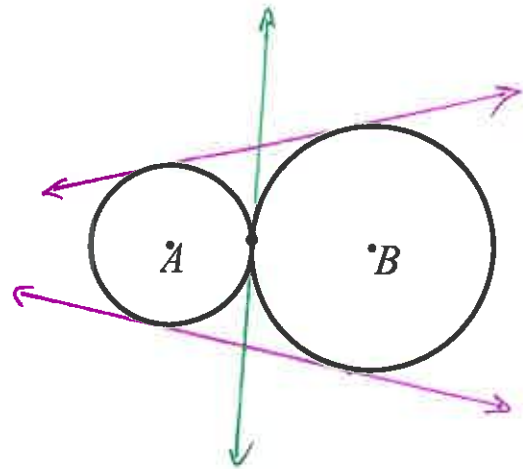
$$160 = x + 51$$

$$x = 109^\circ$$

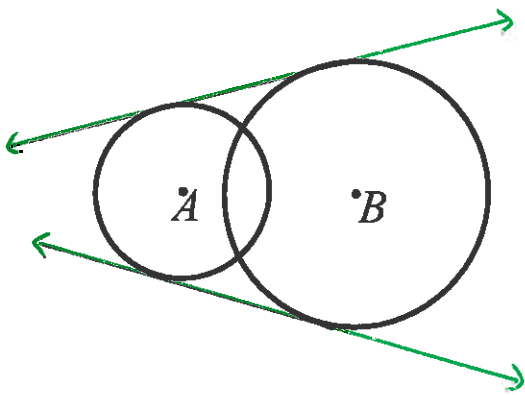
Common Tangents



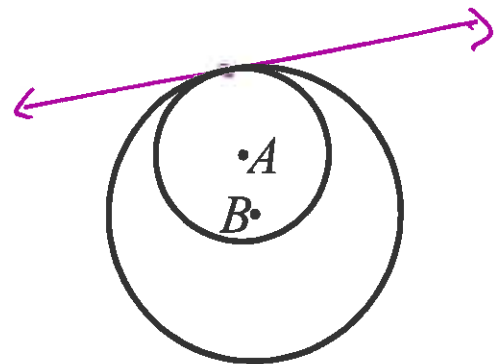
4 common Tangents.



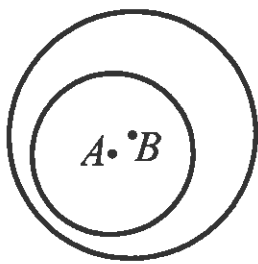
3 common Tangents



2 common Tangents.



1 common Tangent.



0 common Tangents.