

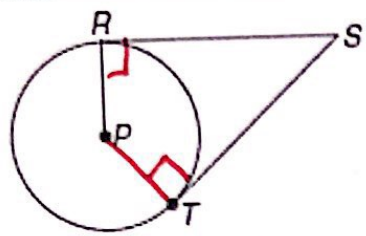
Unit 6 Tangent Lines of Circles

Math 3

SWBAT solve for unknown variables using theorems about tangent lines of circles.

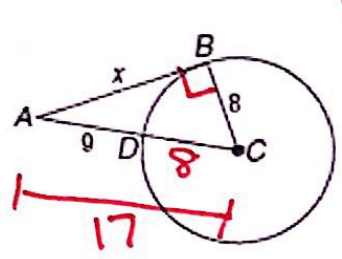
<p>Tangent to a Circle Ex: (AB)</p>	<p>A line in the plane of the circle that intersects the circle in exactly one point. Ex: Segment AB is a tangent to Circle O.</p>	
<p>Point of Tangency</p>	<p>The point where a circle and a tangent intersect. Ex: Point P is a point of tangency on Circle O.</p>	

<p>Tangent Theorem 1: <i>makes a 90 degree angle</i> If a line is tangent to a circle, then it is <u>perpendicular</u> to the radius drawn to the point of tangency.</p>	<p>Converse Theorem 1: If a line is perpendicular to the radius of a circle at its endpoint on a circle, then the line is tangent to the circle.</p>
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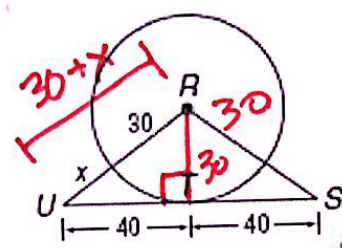


Example: If RS is tangent, then $PR \perp RS$.

Example 1: Find the measure of x.

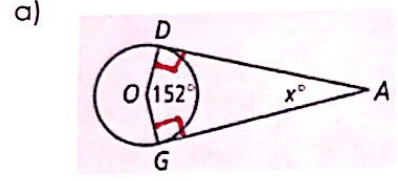


$8^2 + x^2 = 17^2$
 $x = 15$

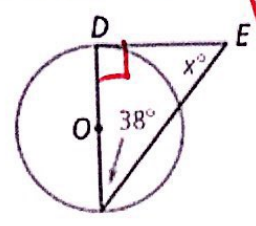


$40^2 + 30^2 = (x+30)^2$
 $2500 = (x+30)(x+30)$
 $2500 = x^2 + 60x + 900$
 $0 = x^2 + 60x - 1600$
 $x = \frac{-60 \pm \sqrt{60^2 - 4(1)(-1600)}}{2(1)}$
 $x = 20$

Example 2: Find x. All segments that appear tangent are tangent to Circle O.

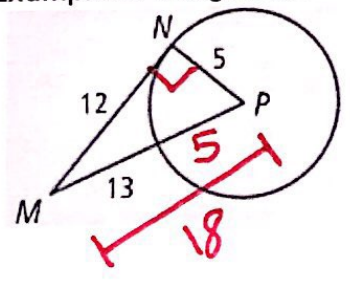


$360 - 90(2) = 152$
 $x = 28$



$180 - 90 - 38$
 $x = 52$

Example 3: Is segment MN tangent to Circle O at P? Explain.

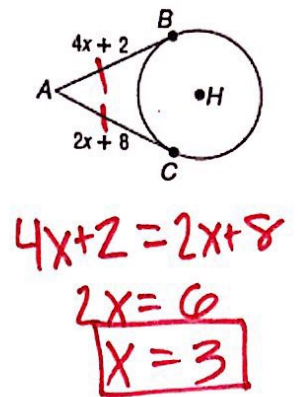
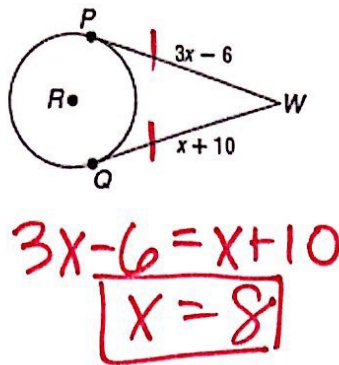
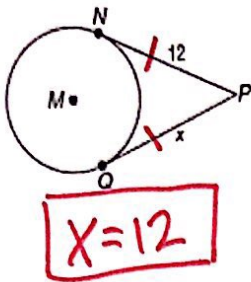


$5^2 + 12^2 = 18^2$
 $169 \neq 324$
no, \overline{MN} is not tangent to $\odot P$ at N.

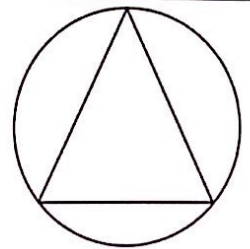
Tangent Theorem 2:

If two tangent segments to a circle share a common endpoint outside the circle, then the two segments are congruent.

Example 4: Solve for x.

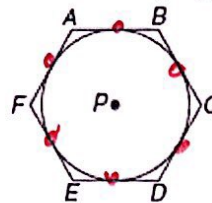
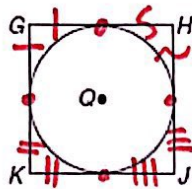


Circumscribed vs. Inscribed	
To circumscribe is when you draw a figure around another, touching it at points as possible.	To inscribe is to draw a figure within another so that the inner figure lies entirely within the boundary of the outer.
Ex: The circle is circumscribed about the triangle.	Ex: The triangle is inscribed in the circle.

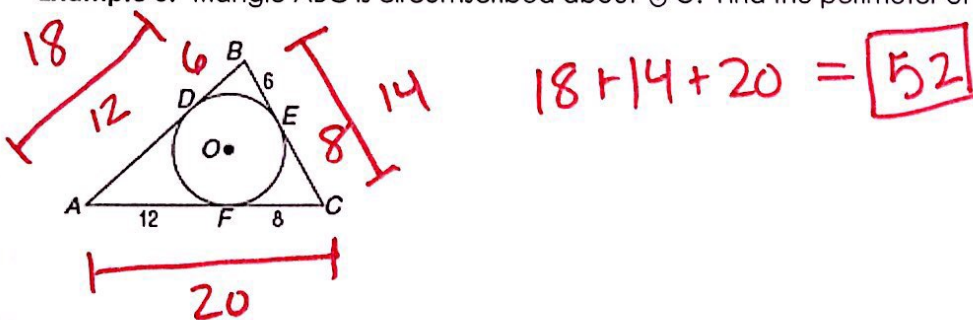


Tangent Theorem 3: (Circumscribed Polygons)

When a polygon is circumscribed about a circle, all of the sides of the polygon are tangent to the circle.



Example 5: Triangle ABC is circumscribed about $\odot O$. Find the perimeter of triangle ABC.



You Try! Find x. Assume that segments that appear to be tangent are tangent.

