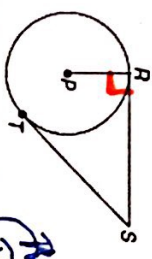


6.7 Tangent Lines of Circles

Tangent to a Circle Ex: (AB)	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.	
Point of Tangency	The point where a circle and a tangent intersect. Ex: Point P is a point of tangency on Circle O.	

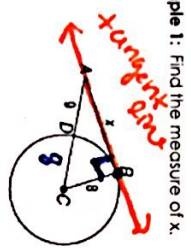
Tangent Theorem 1: If a line is tangent to a circle, then it is perpendicular to the radius drawn to the point of tangency.

In My Own Words: A tangent & radius are perpendicular.



Example: If RS is tangent, then PR ⊥ RS.

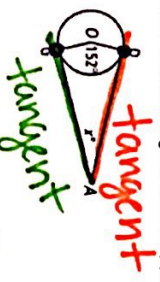
My Own Words: $R^2 + T^2 = C^2$



Example 1: Find the measure of x.

$x^2 + 8^2 = (4+x)^2$
 $x^2 + 64 = 17^2$
 $x = 15$

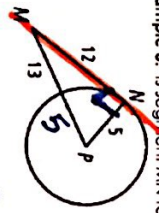
Example 2: Find x. All segments that appear tangent are tangent to Circle O.



tangent

$\angle D = 90^\circ < \angle G = 90^\circ$

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



$12^2 + 5^2 = (13+5)^2$

$144 + 25 = (18)^2$

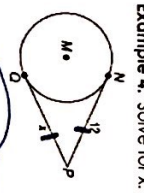
$169 \neq 324$

~~MN~~ MN is not a tangent line.

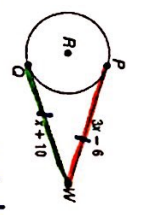
Tangent Theorem 2:

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.

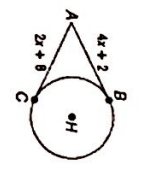


$x = 12$



$3x - 6 = x + 10$

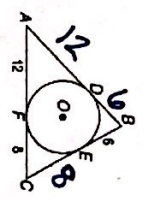
$2x = 16$
 $x = 8$



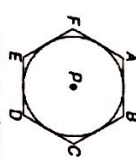
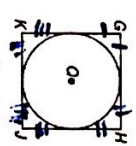
Circumscribed vs. Inscribed	
To circumscribe is when you draw a figure around another, touching it at points as possible.	To inscribe is to draw a figure within another so that the inner figure lies entirely within the boundary of the outer.
My Own Words: Shape drawn is on the outside	My Own Words: Shape drawn is on the inside

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.



$(12+6) + (6+8) + (12+8) = 18 + 14 + 20 = 52$



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

