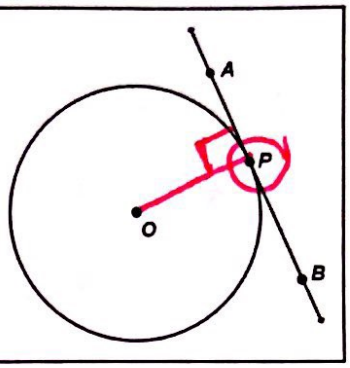
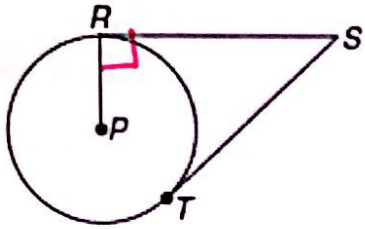
GUIDED NOTES: Tangents

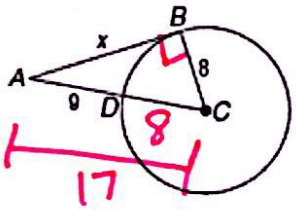
Tangent to a Circle	A line in the plane of the circle that intersects the circle in exactly one point. ***Ex:*** *Segment AB is a tangent to Circle O.*	
Point of Tangency	The point where a circle and a tangent intersect. ***Ex:*** *Point P is a point of tangency on Circle O.*	

Tangent Theorem 1:	In My Own Words...
If a line is tangent to a circle, then it is perpendicular to the radius drawn to the point of tangency.	tangent lines are ⊥ to ⊙



If RS is tangent, then PR ⊥ RS.

EX1: Solve for x.



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

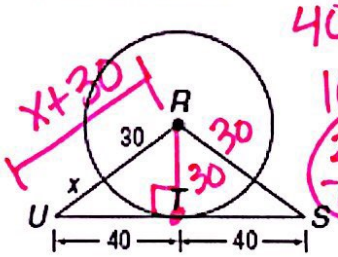
$x^2+64=289$

$-64 \quad -64$

$\sqrt{x^2}=\sqrt{225}$

$x=15$

EX2: Solve for x.



$40^2+30^2=(x+30)^2$

$1600+900=(x+30)(x+30)$

$2500=x^2+30x+30x+900$

$-2500 \quad -2500$

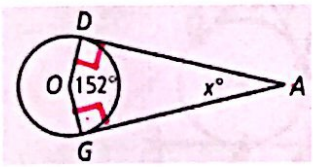
$0=x^2+60x-1600$

$x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$

$x=\frac{-60\pm\sqrt{60^2-4(1)(-1600)}}{2(1)}$

$x=-80, 20$

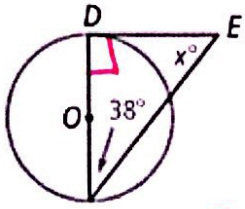
EX3: Solve for x.



$360-90(2)-152$

$x=28°$

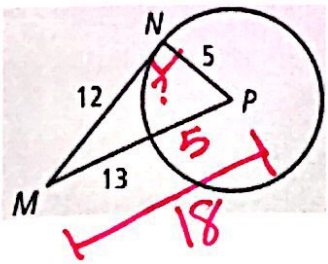
EX4: Solve for x.



$180-90-38$

$x=52°$

EX5: Is segment MN tangent to Circle O at P?



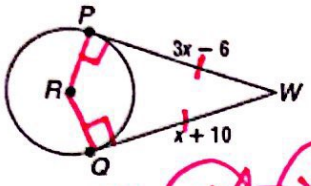
$5^2+12^2=18^2$

$169=324$

not tangent!

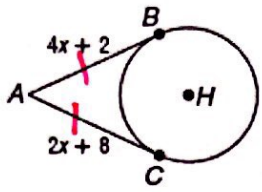
Tangent Theorem 2:	*If two tangent segments to a circle share a common endpoint outside the circle, then the two segments are congruent.*

EX6: Solve for x.



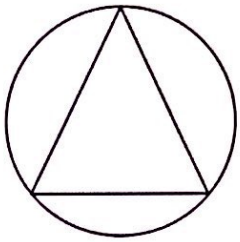
$3x-6=x+10$
$-x \quad +6 \quad -x \quad +6$
$\frac{2x}{2}=\frac{16}{2}$
$\boxed{x=8}$

EX7: Solve for x.

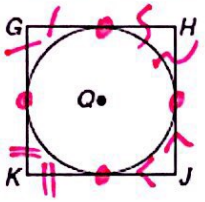


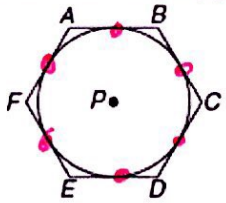
$4x+2=2x+8$
$-2x \quad +2 \quad -2x \quad -2$
$2x=6$
$\boxed{x=3}$

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: Circumscribe = touch outside ○	***My Own Words:*** inscribe = touch inside △

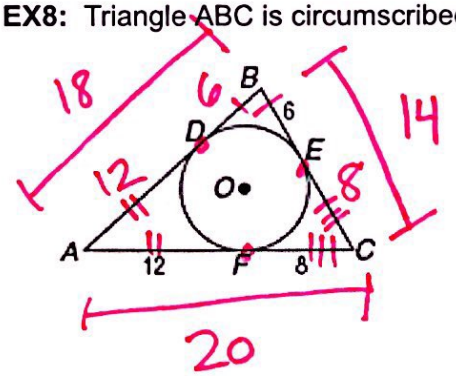


Tangent Theorem 3: (Circumscribed Polygons)	*When a polygon is circumscribed about a circle, all of the sides of the polygon are tangent to the circle.*





EX8: Triangle ABC is circumscribed about ⊙O. Find the perimeter of triangle ABC.



$18+20+14=\boxed{52}$