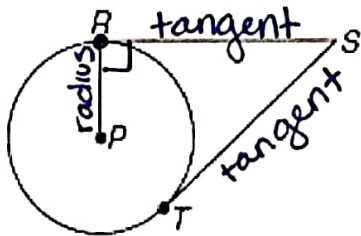


April 3

GUIDED NOTES: Tangents

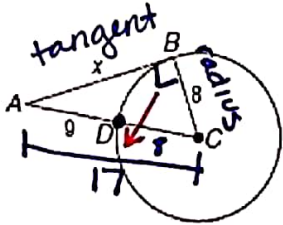
<p><u>Tangent to a Circle</u></p>	<p>A line in the plane of the circle that intersects the circle in <u>exactly one point</u>. <i>Ex: Segment AB is a tangent to Circle O.</i></p>	
<p><u>Point of Tangency</u></p>	<p>The point where a circle and a tangent intersect. <i>Ex: Point P is a point of tangency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

<p>Tangent Theorem 1:</p> <p>If a line is tangent to a circle, then it is perpendicular to the radius drawn to the point of tangency.</p>	<p>In My Own Words...</p> <p>A radius and a tangent make a right angle.</p>
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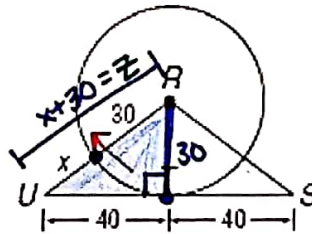
If RS is tangent, then $PR \perp RS$.
 ↑
 perpendicular

EX1: Solve for x.



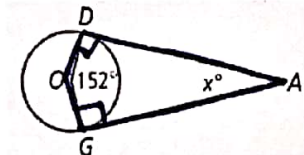
$$\begin{aligned}
 x^2 + 8^2 &= 17^2 \\
 x^2 + 64 &= 289 \\
 -64 &-64 \\
 \hline
 x^2 &= 225 \\
 \boxed{x = 15}
 \end{aligned}$$

EX2: Solve for x.



$$\begin{aligned}
 40^2 + 30^2 &= z^2 \\
 1600 + 900 &= z^2 \\
 \sqrt{2500} &= \sqrt{z^2} \\
 50 &= z \\
 50 - 30 &= \boxed{20 = x}
 \end{aligned}$$

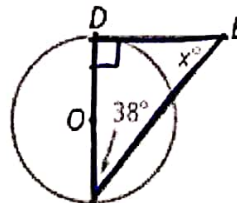
EX3: Solve for x.



*All quadrilaterals have 360° .

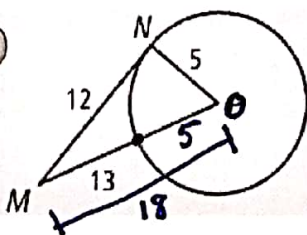
$$\begin{aligned}
 360 - 90 - 90 - 152 &= 28^\circ \\
 \boxed{x = 28^\circ}
 \end{aligned}$$

EX4: Solve for x.



$$\begin{aligned}
 180 - 90 - 38 &= 52 \\
 \boxed{x = 52^\circ}
 \end{aligned}$$

EX5: Is segment MN tangent to Circle O?



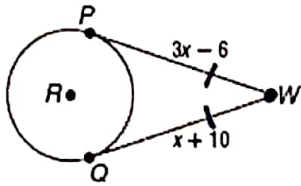
$$\begin{aligned}
 12^2 + 5^2 &= 18^2 \\
 144 + 25 &= 324 \\
 169 &\neq 324
 \end{aligned}$$

not a tangent.
 Pythagorean Theorem did not hold true.

Tangent Theorem 2:

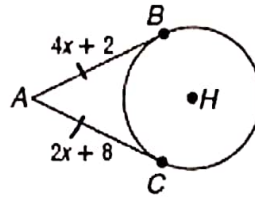
If two tangent segments to a circle share a common endpoint outside the circle, then the two segments are congruent.

6: Solve for x.



$$\begin{aligned}
 3x - 6 &= x + 10 \\
 -x & \quad -x \\
 \hline
 2x - 6 &= 10 \\
 +6 & \quad +6 \\
 \hline
 2x &= 16 \\
 \frac{2x}{2} &= \frac{16}{2} \\
 \boxed{x = 8}
 \end{aligned}$$

EX7: Solve for x.



$$\begin{aligned}
 4x + 2 &= 2x + 8 \\
 -2x & \quad -2x \\
 \hline
 2x + 2 &= 8 \\
 -2 & \quad -2 \\
 \hline
 2x &= 6 \\
 \frac{2x}{2} &= \frac{6}{2} \\
 \boxed{x = 3}
 \end{aligned}$$

Circumscribed vs. Inscribed

To **circumscribe** is when you draw a figure around another, touching it at points as possible.

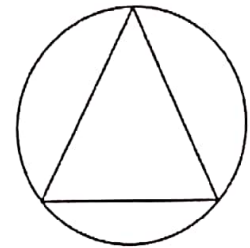
To **inscribe** is to draw a figure within another so that the inner figure lies entirely within the boundary of the outer.

My Own Words:

shape is outside the circle

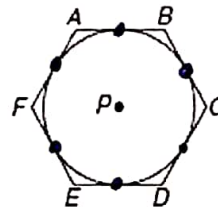
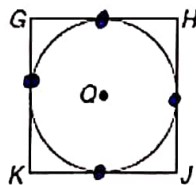
My Own Words:

shape is inside the circle

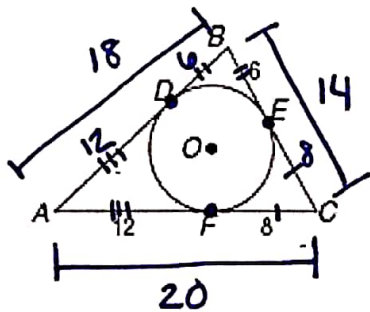


Tangent Theorem 3: (Circumscribed Polygons)

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



EX8: Triangle ABC is circumscribed about $\odot O$. Find the perimeter of triangle ABC.



$$\begin{aligned}
 P &= 18 + 14 + 20 \\
 \boxed{P = 52}
 \end{aligned}$$