Properties of Tangent Lines to a Circle

Name _____

Date _____ Period _____

What is a Tangent Line?

A tangent line is a line that intersects the circle at exactly one point.

The point of intersection between a circle and the tangent line is called the point of tangency.
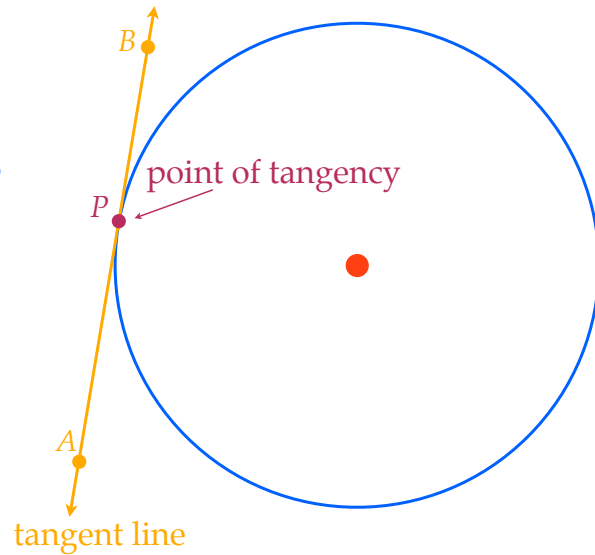
B

point of tangency

P

A

tangent line

Tangent Line Theorem

If a line is tangent to a circle, then that line is perpendicular to the radius drawn to the point of tangency.

tangent line

90º

B

point of tangency

*P*

90º

A

90º

90º

tangent line
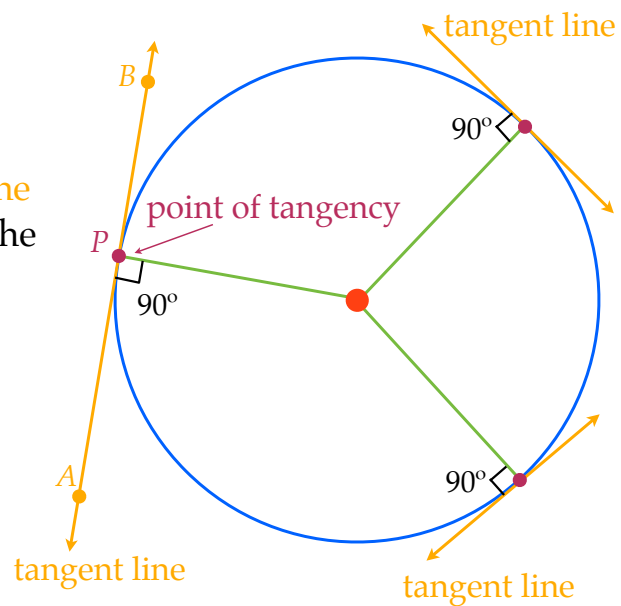
tangent line

Tangent Line Theorem

If a line is tangent to a circle, then that line is perpendicular to the radius drawn to the point of tangency.

## Converse of Tangent Line Theorem

If a line is perpendicular to the radius at the endpoint on the circle, then that line is tangent to the circle.

tangent line

B

point of tangency

P

90°

90°

A

90°

tangent line

tangent line
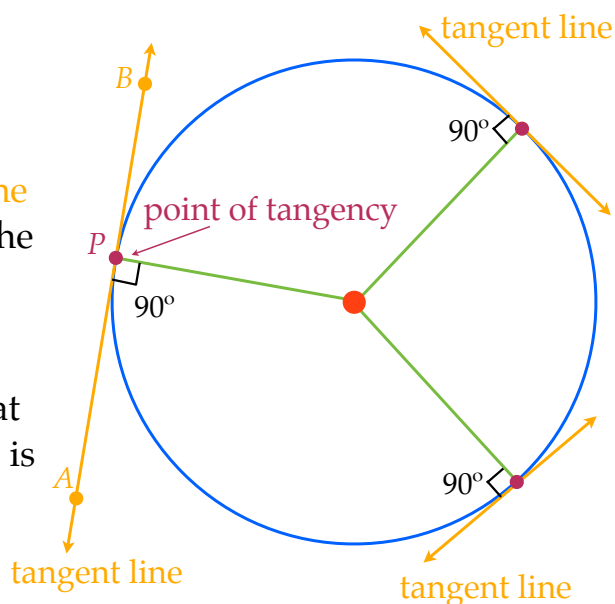
Segment Tangent Theorem

If two segments are tangent to a circle from the same point outside the circle, then they are congruent segments.

Y

C

Z

X

Properties of Tangent Lines to a Circle
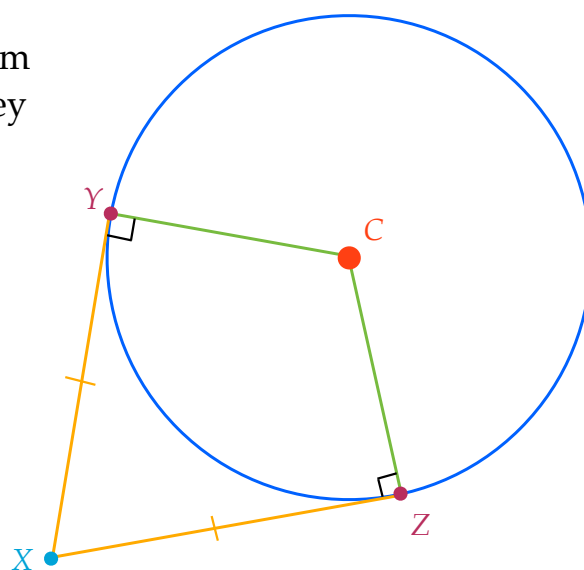
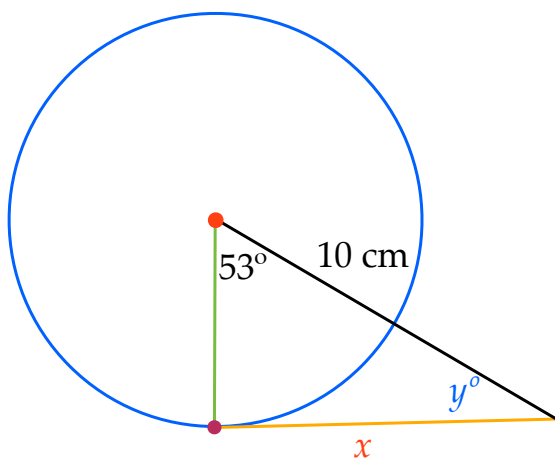Inscribed - a circle is "inscribed" in a polygon if the sides of the polygon are tangent to the circle.

The circle is "inscribed" within the quadrilateral

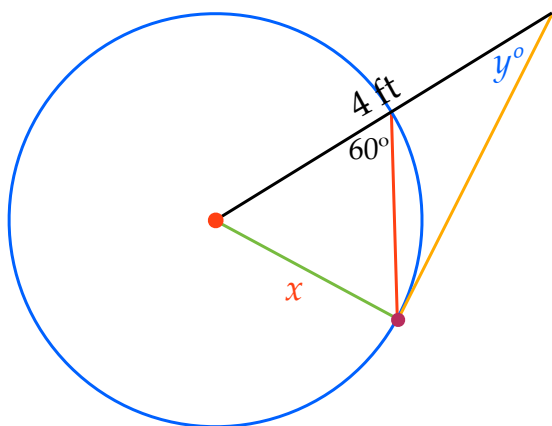The quadrilateral is "circumscribed" around the circle
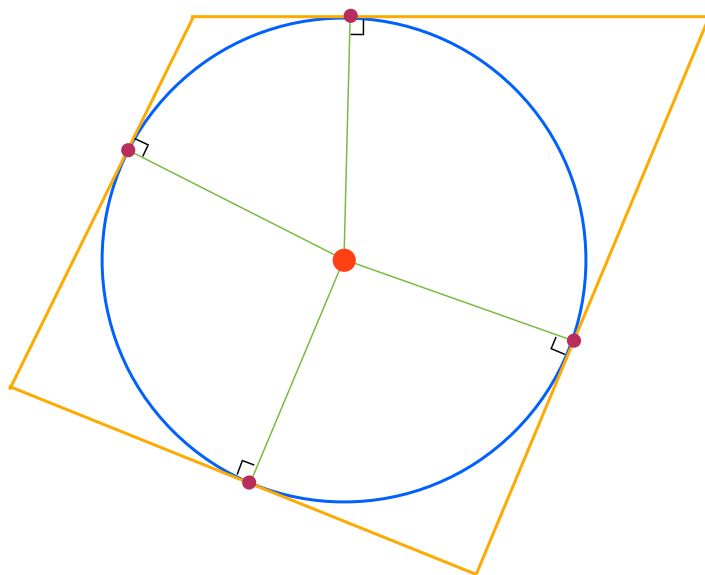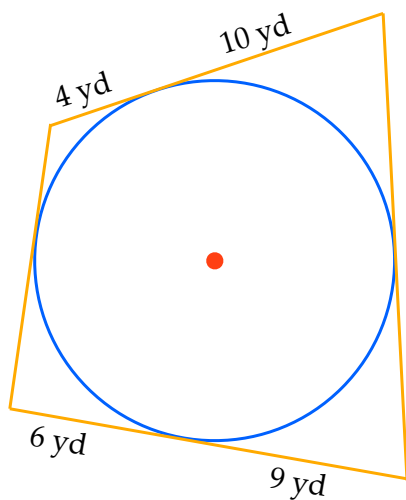
Solve for the value of x and y.

diameter = 12 cm

53°   10 cm

y^o

x

Properties of Tangent Lines to a Circle

Solve for the value of x and y.

4 ft
60°
$y°$
x

Find the perimeter of the polygon

10 yd
4 yd
6 yd
9 yd

Statements	Reasons

Given: $\overline{XZ}$ is tangent to $\bigcirc A$ at Y

$\overline{XY} \cong \overline{YZ}$

Prove: $\overline{AX} \cong \overline{AZ}$

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