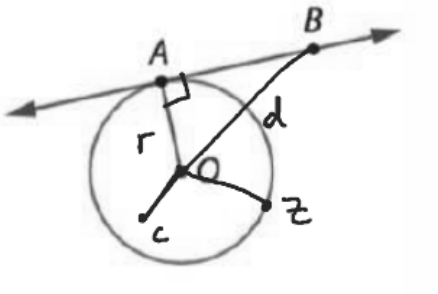
What you will learn about:
Properties of Circles

Tangents

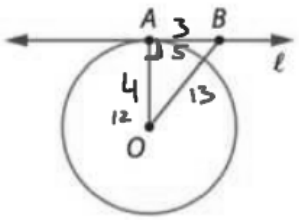
If a radius (diameter) intersects a tangent at the point of tangency then the radius (diameter) are perpendicular.



Points on the interior, exterior, or on the circle.

Refer to the figure on the right.

If line *l* is tangent to circle O at point A, the radius of the circle is 4 inches, and AB is =3 inches, what is the length BO? Explain.



$3^2+4^2=BO^2$

$9+16=BO^2$

$25=BO^2$ $5=BO$

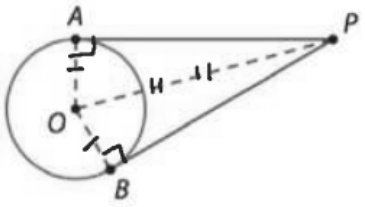
If AB=5 cm, and AO=12 cm, and BO= 13 cm, why is it correct to conclude that line *l* must be tangent to the circle at point A? $5^2+12^2=13^2$

$25+144=169$

$169=169$

SSS
SAS
ASA
AAS
HL

Now suppose you are given that $\overline{PA}$ *and* $\overline{PB}$ are tangents to a circle centered at O. To help prove that $\overline{PA} \cong \overline{PB}$, auxiliary line segments $\overline{OA}, \overline{OB}$, *and* $\overline{OP}$ are drawn in the figure.



$\triangle AOP \cong \triangle BOP$

CPCTC

How could you use congruent triangles to prove $\overline{PA} \cong \overline{PB}$?

Statement	Reason.

How could you use the Pythagorean Theorem to show that $\overline{PA} \cong \overline{PB}$?

State in words the theorem you have proved about tangents drawn to a circle from an exterior point.