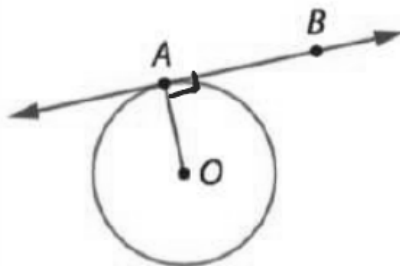


What you will learn about:
Properties of Circles

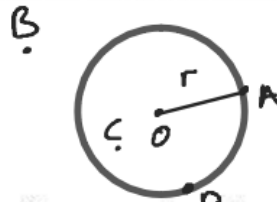
Tangents

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



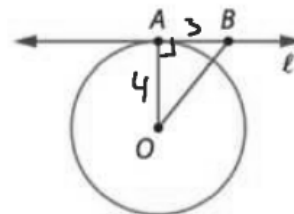
\longleftrightarrow
AB - tangent
Point A - Point of tangency

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.

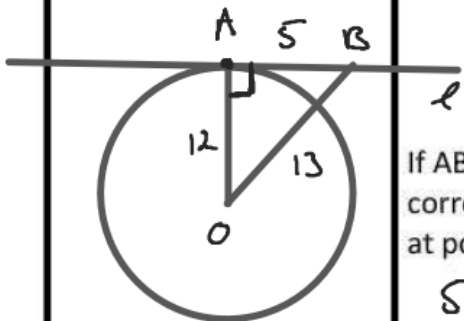


$$4^2 + 3^2 = OB^2$$

$$16 + 9 = OB^2$$

$$25 = OB^2$$

$$OB = 5$$



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?

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

$$25 + 144 = 169$$

SAS

ASA

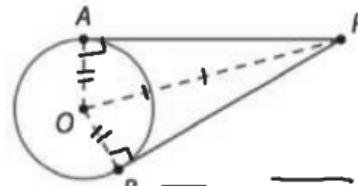
AAS

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SSS

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.



$\overline{PA} \cong \overline{PB}$

CPCTC

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

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.

Tangents to a circle from the same external point are congruent