Circles

title

Circle—the set of all points in a plane that are equidistant from a given point, called the center of the circle

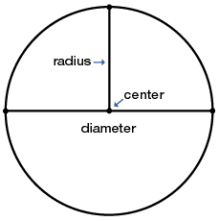
- A circle with center *P* is called "circle *P*," written $\odot P$

Radius—the distance/segment from the center of a circle to a point on the circle

- Plural is *radii*.
- All radii of a circle are congruent.

Diameter—the distance/segment across a circle through its center

- The diameter is twice the radius.

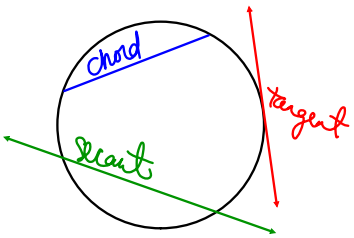


circle

Chord—a segment whose endpoints are on a circle

Secant—a line that intersects a circle in two points

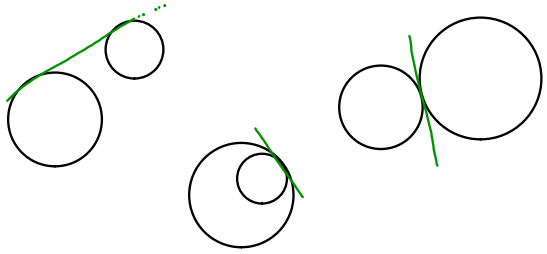
Tangent—a line that intersects a circle in exactly one point, called the point of tangency



segments & lines

Common tangent—a line, segment, or ray that is tangent to two circles

- *internal*: intersects the segment that joins the centers of the two circles
- *external*: does not intersect the segment that joins the centers of the two circles



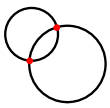
common tangents

Coplanar Circles

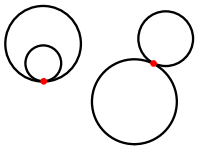
Tangent circles—circles that intersect in one point

Concentric circles—circles that have a common center

2 points of intersection

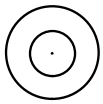


1 point of intersection



tangent circles

no points of intersection

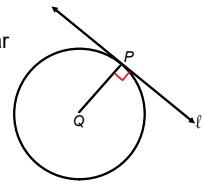


concentric circles

coplanar circles

Theorem

A tangent to a circle is perpendicular to the radius of the circle at the point of tangency.



tangent thms

Determine whether segment *AB* is tangent to circle *C*. *Explain*.

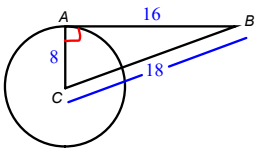
$a^2+b^2=c^2$

$8^2+16^2=18^2$

$64+256=324$

$320 \neq 324$

AB is not a tangent



examples

Find the value(s) of the variable.

$a^2+b^2=c^2$

$r^2+55^2=(r+25)^2$

$r^2+3025=(r+25)(r+25)$

$r^2+3025=r^2+25r+25r+625$

$r^2+3025=r^2+50r+625$

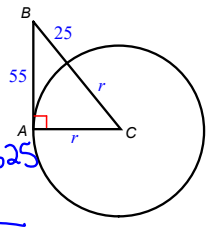
$-r^2 \quad -r^2$

$3025=50r+625$

$-625 \quad -625$

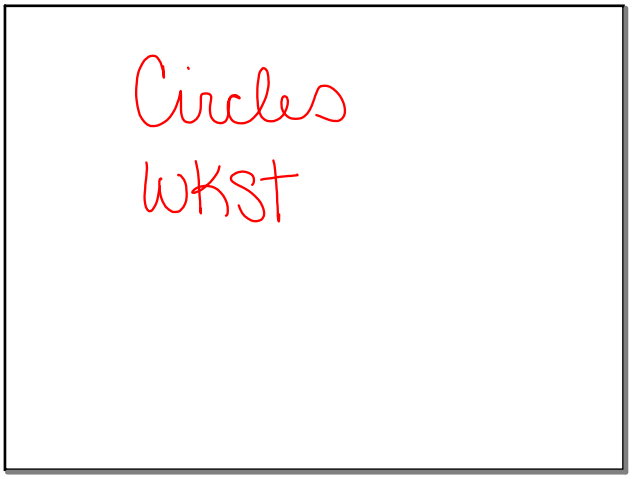
$\frac{2400}{50}=\frac{50r}{50}$

$48=r$



$r=48$

examples



Apr 17-12:03 PM