

Geometry Notes Section 12-1
Lines That Intersect Circles

April 21

Lines and Segments That Intersect Circles

- A **chord** is a segment whose endpoints lie on a circle.
- A **secant** is a line that intersects a circle at two points.
- A **tangent** is a line in the same plane as a circle that intersects the circle at exactly one point, called the **point of tangency**.
- Radial and diameters also intersect circles.

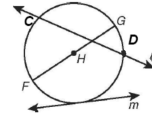
\overline{AB} and \overline{CD} are chords.
 \overline{CD} is a secant.
 l is a tangent.
 E is a point of tangency.

Tangent Circles

Two coplanar circles that intersect at exactly one point are called **tangent circles**.

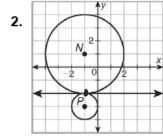
points of tangency

1. Identify each line or segment that intersects circle H .

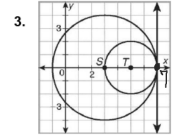


\overline{HG} radius
 \overline{CD} chord
 line m tangent
 \overline{FG} diameter
 line l secant

Identify the point of tangency and write the equation of the line at that point.



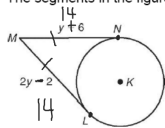
point of tangency $(0, 0)$
 equation of tangent line $y = -2$



point of tangency $(10, 0)$
 equation of tangent line $x = 7$

Theorem	Hypothesis	Conclusion
If two segments are tangent to a circle from the same external point, then the segments are congruent.	<p>\overline{EF} and \overline{EG} are tangent to circle C.</p>	$\overline{EF} \cong \overline{EG}$

4. The segments in the figure are tangent to circle K . Find LM . $= 14$

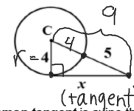


$$2y - 2 = y + 6$$

$$y = 8$$

Theorem	Hypothesis	Conclusion
If a line is tangent to a circle, then it is perpendicular to the radius at the point of tangency.	<p>l is tangent to $\odot A$</p>	$l \perp \overline{AB}$

5. Find the length of x in simplest radical form.

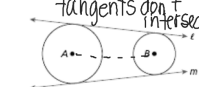


$$4^2 + x^2 = 9^2$$

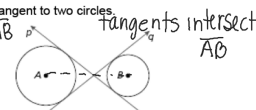
$$\sqrt{x^2} = \sqrt{65} = \sqrt{5 \cdot 13}$$

$$x = \sqrt{65}$$

A **common tangent** is a line that is tangent to two circles.



Lines f and m are common external tangents to circle A and circle B .



Lines p and q are common internal tangents to circle A and circle B .

