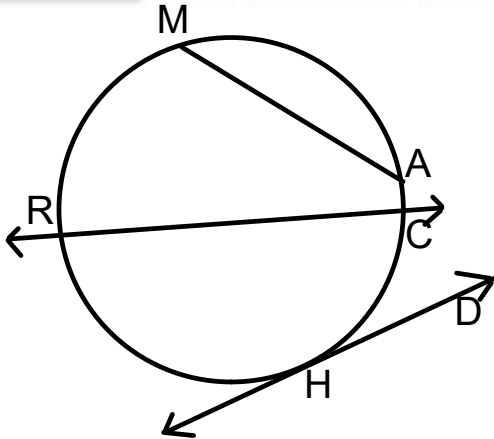


12-1

Lines That Intersect Circles



A _____ is a segment whose endpoints lie on a circle.

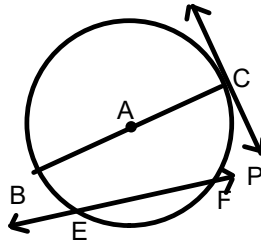
A _____ is a line that intersects a circle at two points.

A _____ is a line in the same plane as the circle, that intersects it at exactly one point. This point is called the _____ of _____.

Ex 1: Match each:

- \overline{EF}
- \overleftrightarrow{CP}
- \overline{AC}
- \overleftrightarrow{EF}
- \overline{BC}

- radius
- diameter
- chord
- secant
- tangent



This is circle A, circles are named by their center.

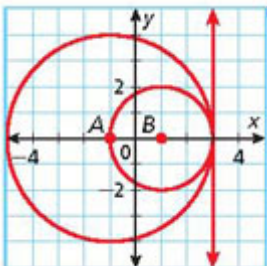
Congruent circles have _____

Concentric circles are coplanar with _____.

Tangent circles are coplanar circles that _____

Internally tangent

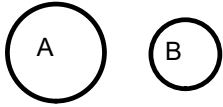
Externally tangent



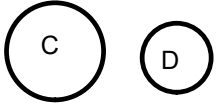
Ex 2: Find the length of each radius. _____
 Identify the point of tangency. _____
 Write the equation for the tangent line. _____

A common tangent is a line that is _____ to _____ circles.

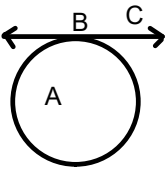
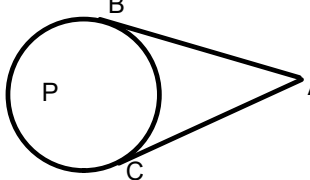
Draw common external tangent lines for OA and OB



Draw common internal tangent lines for OC and OD

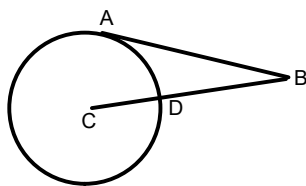


Theorems

<p>If a line is tangent to a circle, then it is _____ to the radius at the point of tangency. (Converse is also true)</p>	 <p>Given: OA, BC is tangent to OA Conclusion: _____</p>
<p>If two segments are tangent to a circle from the same external point, then the segments are _____.</p>	 <p>Given: AB and AC are tangent to OP Conclusion: _____</p>

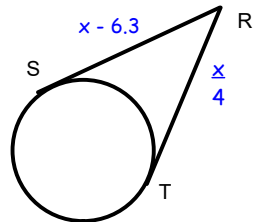
Ex 3: OC, AB = 8, AB is tangent, radius is 6

Find DB _____



Ex 4: RS and RT are tangents

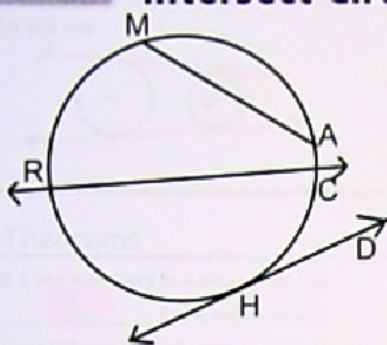
Find $x =$ _____ $RS =$ _____



Ex 5: The summit of Mount Everest is approximately 29,000 ft above sea level. What is the distance from the summit to the horizon to the nearest mile?



12-1 Lines That Intersect Circles

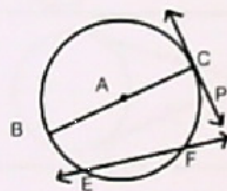
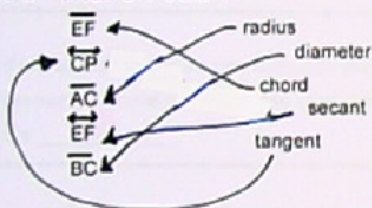


A chord is a segment whose endpoints lie on a circle.

A secant is a line that intersects a circle at two points.

A tangent is a line in the same plane as the circle, that intersects it at exactly one point. This point is called the point of tangency.

Ex 1: Match each:

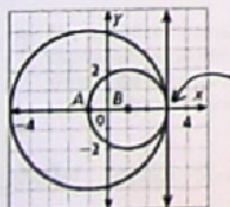
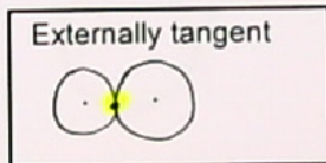
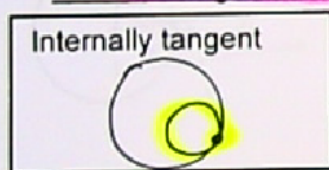


This is circle A, $\odot A$
circles are named by their center.

☺ Congruent circles have \approx radii

☺ Concentric circles are coplanar with the same center

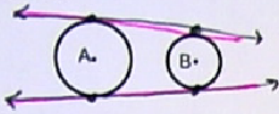
☺ Tangent circles are coplanar circles that intersect at exactly one point



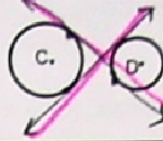
Ex 2: Find the length of each radius. $\odot A = 4$ $\odot B = 2$
Identify the point of tangency. $(3, 0)$
Write the equation for the tangent line. $x = 3$

A common tangent is a line that is tangent to 2 circles.

Draw common external tangent lines for OA and OB

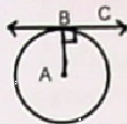


Draw common internal tangent lines for OC and OD



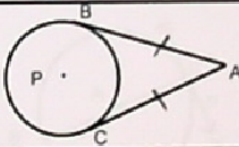
Theorems

If a line is tangent to a circle, then it is perpendicular to the radius at the point of tangency. (Converse is also true)



Given: \overline{OA} , \overline{BC} is tangent to $\odot A$
Conclusion: $\overline{BC} \perp \overline{BA}$

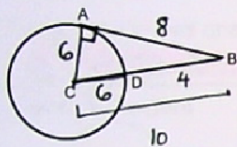
If two segments are tangent to a circle from the same external point, then the segments are congruent.



Given: \overline{AB} and \overline{AC} are tangent to $\odot P$
Conclusion: $\overline{AB} \cong \overline{AC}$

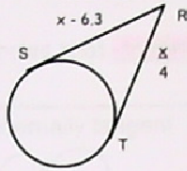
Ex 3: OC, AB = 8, AB is tangent, radius is 6

Find DB 4



Ex 4: \overline{RS} and \overline{RT} are tangents

Find $x = \underline{8.4}$ $RS = \underline{2.1}$



$$\frac{x}{4} = x - 6.3$$

$$x = 4(x - 6.3)$$

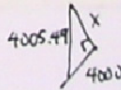
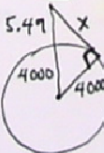
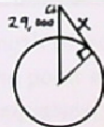
$$x = 4x - 25.2$$

$$-3x = -25.2$$

Ex 5: The summit of Mount Everest is approximately 29,000 ft above sea level. What is the distance from the summit to the horizon to the nearest mile?

Earth's radius ≈ 4000 mi

$$\frac{29000}{5280} \approx 5.49 \text{ mi}$$



$$x^2 - (4000)^2 = (4005.49)^2$$

$$x^2 + 16,000,000 = 16,043,600.4$$

$$x^2 = 43,600.4$$

$$x \approx 209.64$$

210 mi