| TOPIC: **10.1 Use Properties of Tangents** | NAME: KEY<br>DATE: |
|---|---|

ESSENTIAL QUESTION: **How can you verify that a segment is a tangent to a circle?**

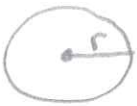
QUESTIONS:

**Vocabulary:**

**Circle**
set of all points in a plane that are equidistant from a given point (center)

**Center**


**Radius**
A segment from the center to a point on the circle




**Diameter**
A segment whose endpoints are on the circle and contains the center

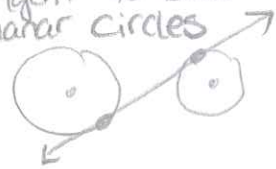
**Chord**
A segment whose endpoints are on the circle

**Secant**
A line that intersects a circle in two pts.

**Tangent**
A line that intersects the circle at exactly one point

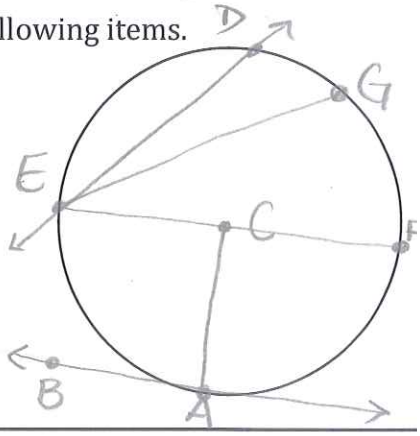
**Coplanar circles**
Circles in the same plane

**Common tangents**
A line, ray, or segment that is tangent to two coplanar circles



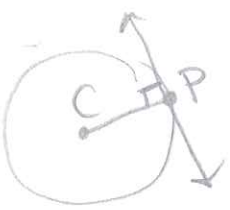
A1. Use the figure at the right to sketch the following items.

a. Tangent $\overleftrightarrow{AB}$, with point of tangency A
b. Center C
c. Radius $\overline{CA}$
d. Secant $\overleftrightarrow{DE}$
e. Diameter $\overline{EF}$
f. Chord $\overline{EG}$




SUMMARY:

A tangent to the circle is ⊥ to the radius of the circle at the endpoint



QUESTIONS:

A2. Use the diagram to find the following...

a. Radius of ⊙ $A$ — $r = 3$ un

b. Diameter of ⊙ $A$ — $d = 6$ un

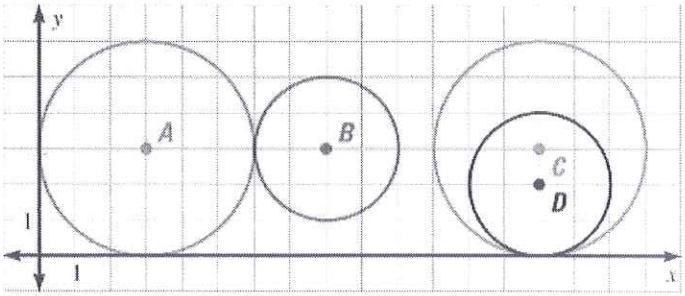
c. Radius of ⊙ $B$ — $r = 2$ un

d. Diameter of ⊙ $D$ — $d = 4$ un.

e. Radius of ⊙ $D$ — $r = 2$ un

f. CD — 1 un

g. BA — 5 un



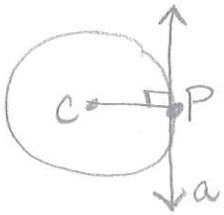

h. Area of ⊙ $A$

Area Circle $= \pi r^2$

$= \pi(3)^2 = 9\pi \text{ un}^2 \approx 28.27 \text{ un}^2$

**Theorem 10.1**

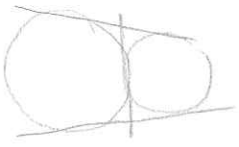
In a plane, a Segment, Line, or ray is tangent to a circle if and only if it is perpendicular to a radius of the circle at its endpoint on the circle.




Line a is ⊥ to radius $\overline{CP}$

A3. Use the diagram from A2 to find the number of common tangents the pair of circles have.

a. ⊙ $A$ and ⊙ $B$



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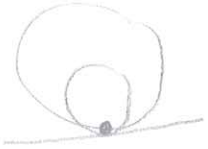
b. ⊙ $C$ and ⊙ $D$



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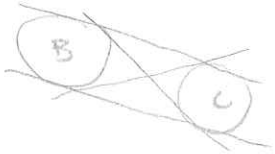
c. ⊙ $B$ and ⊙ $C$

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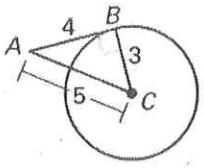
QUESTIONS:

A4. Determine if $\overline{AB}$ is a tangent of $\odot C$. Explain your reasoning.




Yes,

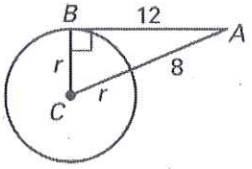
$3^2+4^2=5^2$

$9+16=25$

3,4,5 is a Pyth. triple

$\therefore \triangle ABC$ is a rt $\triangle$ with rt $\angle B$

A5. $\overline{AB}$ is a tangent of $\odot C$. Find *radius r*.




$r^2+12^2=(r+8)^2$

$r^2+144=(r+8)(r+8)$

$r^2+144=r^2+16r+64$

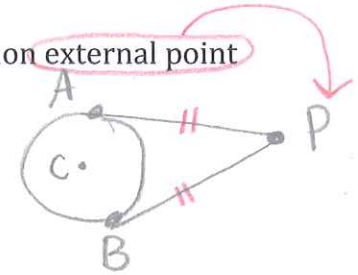
$-r^2 \quad -64 \quad -r^2 \quad -64$

$80=16r$

$r=5$ un

**Theorem 10.2**

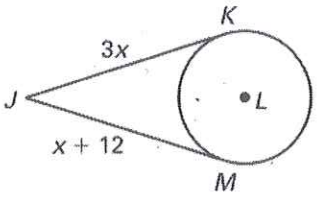
Tangent segments from a common external point are congruent.




$\overline{AP} \cong \overline{BP}$

$AP = BP$

A6. $\overline{JK}$ and $\overline{JM}$ are tangents of $\odot L$. Find the length of $\overline{JK}$.




$3x=x+12$

$-x$

$2x=12$

$x=6$

$JK=3x$

$=3(6)$

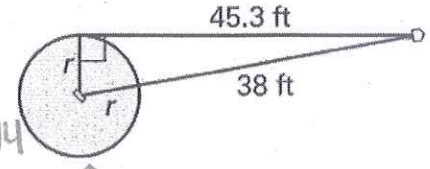
$JK=18$ un

A7. The distance from the edge of softball pitching mound to home plate is 38 feet. Home plate is 45.3 feet to a point of tangency on the pitching mound. Find the diameter of the pitching mound

$r^2+(45.3)^2=(r+38)^2$

$r^2+2052.09=(r+38)(r+38)$

$=r^2+38r+38r+1444$




pitching mound

$r^2+2052.09=r^2+76r+1444$

$-r^2 \quad -1444 \quad -r^2 \quad -1444$

$608.09=76r$

$r=8.00$

$d=2(8)=16$ ft