**Vocabulary** Apply the vocabulary from this lesson to answer each question.

1. A __?__ is a line in the plane of a circle that intersects the circle at two points.
   ((secant) or tangent)

2. Coplanar circles that have the same center are called __?__.
   ((concentric) or congruent)

3. ⊙Q and ⊙R both have a radius of 3 cm. Therefore the circles are __?__.
   (concentric or (congruent))

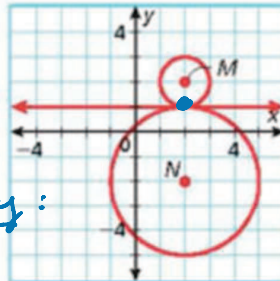**Identify each line or segment that intersects each circle.**

12.
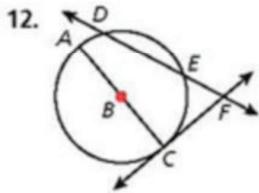
$\overline{AB}, \overline{BC}$ = radius

$\overline{AC}$ = diameter

$\overline{DE}, \overline{AC}$ = chord

$\overleftrightarrow{CF}$ = tangent

$\overleftrightarrow{DE}$ = secant

Multi-Step Find the length of each radius. Identify the point of tangency and write the equation of the tangent line at this point.
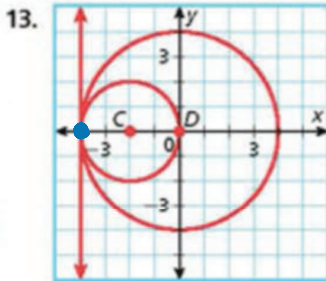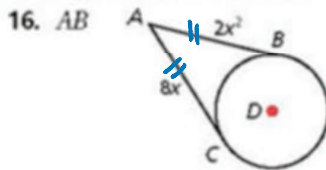
13.

Radii:

$OC = 2$

$OD = 4$

Pt of Tangency:

$(-4, 0)$

Equation: $x = -4$

14.

Radii:

$\odot M = 1$

$\odot N = 3$

Pt. of Tangency: $(2, 1)$

Equation: $y = 1$

The segments in each figure are tangent to the circle. Find each length.

16. AB

tangent-tangent:

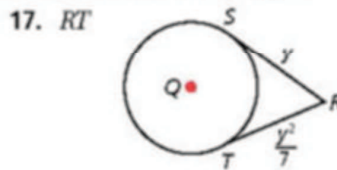$2x^2 = 8x$

Factor out GCF → $2x^2 - 8x = 0$

$2x(x-4) = 0$

$2x = 0 \quad x - 4 = 0$

$x = 0 \quad x = 4$

If $x = 0$: $AC = 0$

If $x = 4$: $AC = 8(4)$

$\boxed{AC = 32}$
& $AB = 32$

17. RT

tangent-tangent:

$7 \cdot y = \frac{y^2}{7} \cdot 7$

$7y = y^2$

$0 = y^2 - 7y$

Factor out GCF → $0 = y(y-7)$

$y = 0 \quad y - 7 = 0$
$\quad\quad\quad y = 7$

If $x = 0$, $SR = 0$ If $y = 7$, $SR = 7$
$\boxed{+ TR = 7}$

Tell whether each statement is sometimes, always, or never true.

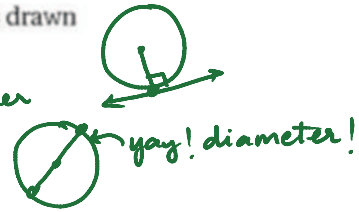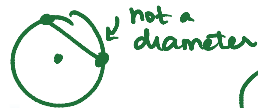18. Two circles with the same center are congruent. **S**

19. A tangent to a circle intersects the circle at two points. **N – only once**

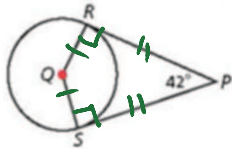20. Tangent circles have the same center. **N**

21. A tangent to a circle will form a right angle with a radius that is drawn to the point of tangency. **A**

22. A chord of a circle is a diameter. **S**

not a diameter

yay! diameter!

In each diagram, $\overline{PR}$ and $\overline{PS}$ are tangent to $\odot Q$. Find each angle measure.
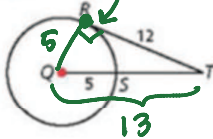
26. $m\angle Q$

$\angle Q + \angle R + \angle P + \angle S = 360°$ b/c it is a quadrilateral!
$\angle Q + 90 + 42 + 90 = 360$ (more specifically.... a kite)

$$\boxed{\angle Q = 138°}$$

✶ Algebra Assume the segments that appear to be tangent are tangent. Find each length.
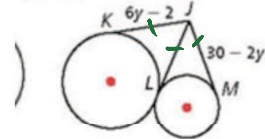
Radius – Tangent

31. *ST*

$ST = 13 - 5$

$$\boxed{ST = 8}$$

Tangent Tangent

33. *JL*

$6y - 2 = 30 - 2y$
$8y = 32$
$y = 4$
$JK = 6(4) - 2$
$JK = 22$ so $JL = 22$