31 Line n is represented by the equation $3x + 4y = 20$. Determine and state the equation of line p, the image of line n, after a dilation of scale factor $\frac{1}{3}$ centered at the point $(4,2)$. [The use of the set of axes below is optional.]
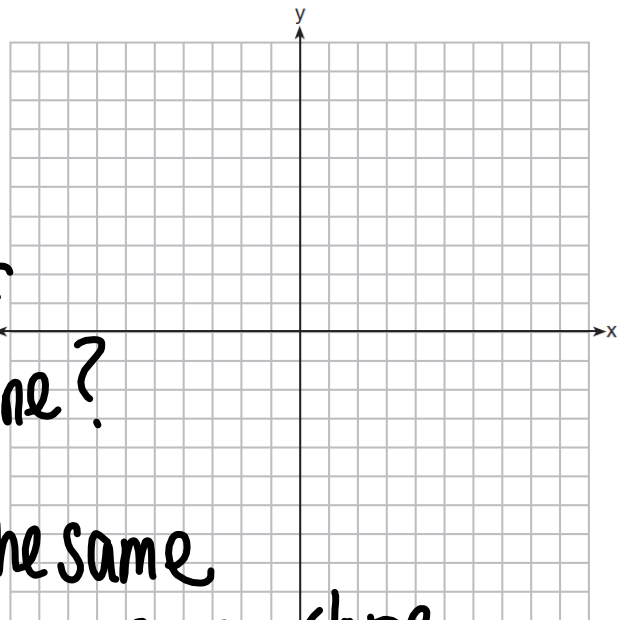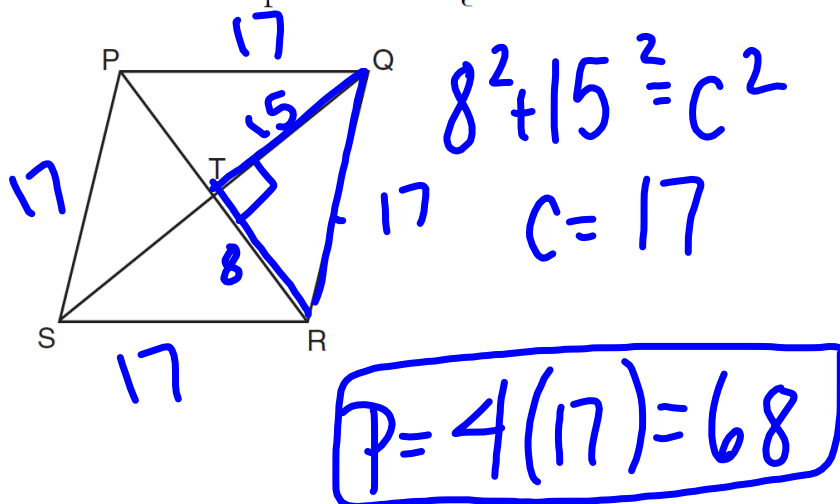
Explain your answer.

① $y =$ form

② graph

③ Is the center of dilation on the line?
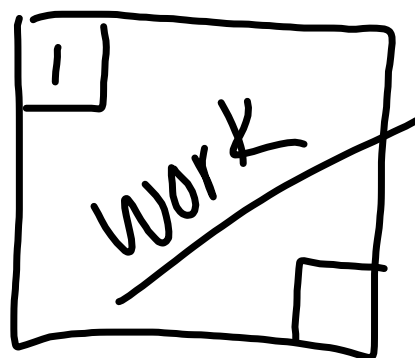
↳ yes → stays the same

↳ No → // line ⟨ same slope
                  y-int × scale fact.

26 In the diagram of rhombus $PQRS$ below, the diagonals $\overline{PR}$ and $\overline{QS}$ intersect at point T, $PR = 16$, and $QS = 30$. Determine and state the perimeter of $PQRS$.

$$8^2 + 15^2 = c^2$$

$$c = 17$$

$$P = 4(17) = 68$$

#'s 1 - 11
skip #4
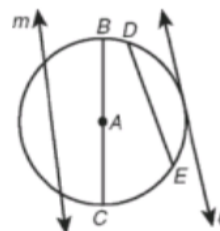Due Tues
QUIZ

work

LESSON	**Practice A**
11-1	*Lines That Intersect Circles*

For Exercises 1–5, match the letter of the part of the figure to the names. Use each letter once.

1. chord   _E_   A. $\overline{AB}$

2. tangent   _B_   B. ℓ

3. radius   _A_   C. m

4. secant   _C_   D. $\overline{BC}$

5. diameter   _D_   E. $\overline{DE}$

Use the figure for Exercises 6–8.

6. radius of ⊙P _2_   radius of ⊙Q _1_

7. coordinates of the point of tangency (_4_ , _2_)

8. equation of the tangent line at the point of tangency
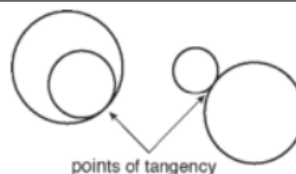
$$x = 4$$
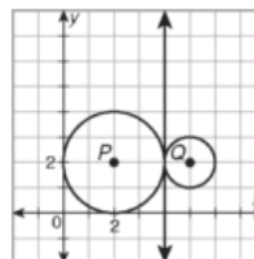
More Problems on other side!

LESSON 11-1

Reteach
Lines That Intersect Circles
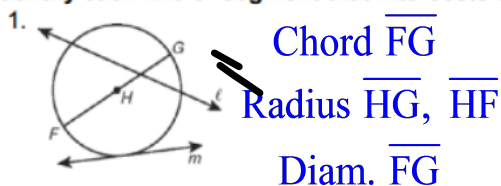
Lines and Segments That Intersect Circles

- 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.**
- Radii and diameters also intersect circles.

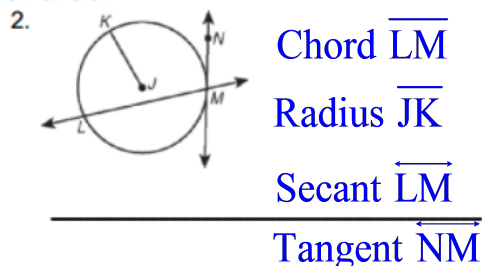$\overline{AB}$ and $\overline{CD}$ are chords.

$\overleftrightarrow{CD}$ is a secant.

ℓ is a tangent.

E is a point of tangency.
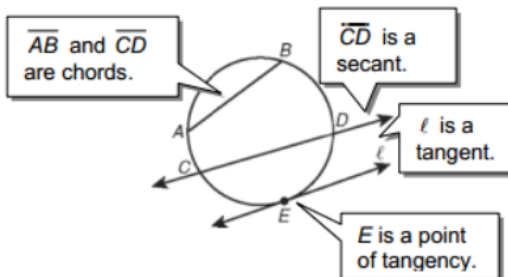
Tangent Circles

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

points of tangency

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

1.

Chord $\overline{FG}$

Radius $\overline{HG},\ \overline{HF}$

Diam. $\overline{FG}$

Secant l Tangent m

2.

Chord $\overline{LM}$

Radius $\overline{JK}$

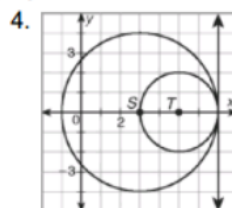Secant $\overleftrightarrow{LM}$

Tangent $\overleftrightarrow{NM}$

Find the length of each radius. Identify the point of tangency and write the equation of the tangent line at that point.

3.
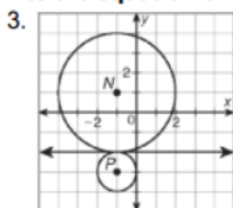
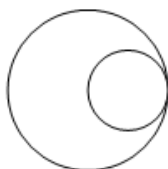Circle N: r = 3

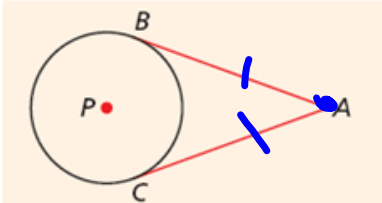Circle P: r = 1

(-1, -2) y = -2

4.

Circle S: r = 4

Circle T: r = 2

(7, 0) x = 7

Class Notes 5: Tangents - continued and Perpendicular Bisector of a Circle **2**

Warm-up: How many common tangents are there for the following circles?

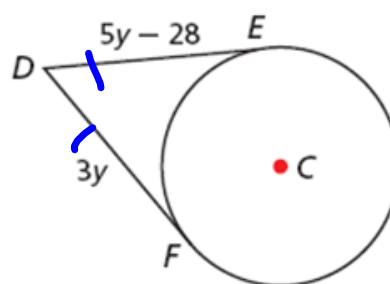| Theorem	Hypothesis	Conclusion
2 segments tangent to a circle from same exterior point → segments $\cong$	$\overline{AB}$ and $\overline{AC}$ are tangent to $\odot P$.	$\overline{AB} \cong \overline{AC}$

Example 1: Using Properties of Tangents

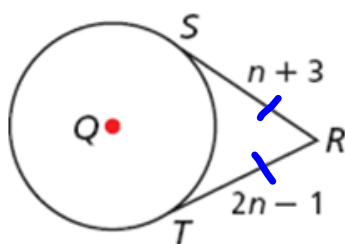$\overline{DE}$ and $\overline{DF}$ are tangent to $\odot C$. Find DF.

$$5y - 28 = 3y$$
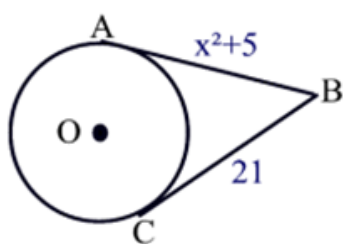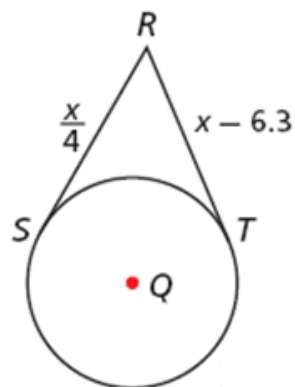$$y = 14$$
$$\boxed{DF = 3(14) = 42}$$

TRY IT!

$\overline{RS}$ and $\overline{RT}$ are tangent to $\odot Q$. Find RS.
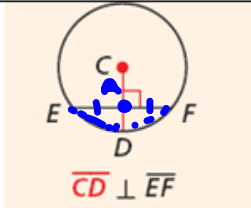
$n + 3$

$2n - 1$

$$n + 3 = 2n - 1$$

$$n = 4$$

$$RS = 7$$
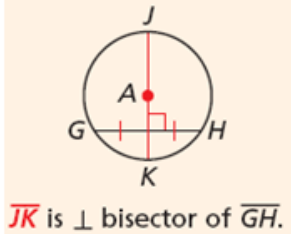
$\frac{x}{4}$

$x - 6.3$

$x^2 + 5$

21

$\overline{AB}, \ \overline{CB}$ tangents.

Find x.

Choose:

○ 21
○ 16
○ 8
○ 4

Perpendicular Bisector of a Circle

Theorem	Hypothesis	Conclusion
In a circle, if a radius (or diameter) is perpendicular to a chord, then it bisects the chord and its arc.	C • E ⋅ ⋅ ⋅ ⋅ F D $\overline{CD} \perp \overline{EF}$	$\overline{EA} \cong \overline{AF}$ ✱ $\overparen{ED} \cong \overparen{DF}$
In a circle, the perpendicular bisector of a chord is a radius (or diameter).	J A • G ⊢⊢⊢ H K $\overline{JK}$ is ⊥ bisector of $\overline{GH}$.	

Example 1: Using Radii and Chords

Find BD.

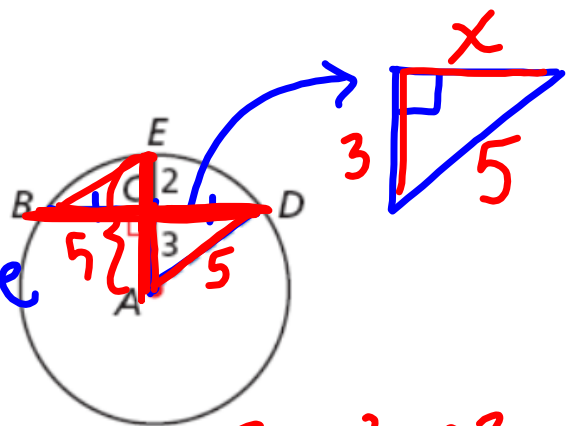Step 1: Draw in a radius to make

Step 2: a Rt. △

Use the pyth. Thm.

Step 3:
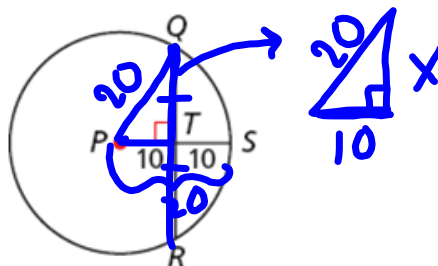
$$BD = 2(x) = 2(4) = 8$$

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

TRY IT!

A) Find **QR** to the nearest tenth.

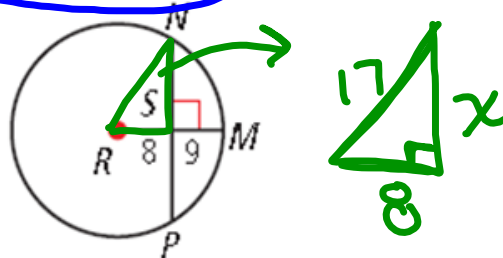Step 1:

Step 2: $10^2 + x^2 = 20^2$

$\sqrt{x^2} = \sqrt{300}$ $x = 17.3205$

Step 3: $QR = 2x = 2(\quad) = 34.6$

B) Find NP.

Step 1:

Step 2: $8^2 + x^2 = 17^2$

$x = 15$

Step 3: $NP = 30$