Lesson 10.5: Tangents

* $\overleftrightarrow{AC}$ is **tangent** to circle P because it intersects the circle at only \_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_.
* This point (point B) is called the:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Theorem**: If a line is tangent to a circle, then it is perpendicular to the radius drawn to the point of tangency.

**Example 1)** $\overbar{BC}$ is tangent to circle A at point C. Find x.

**Theorem:** If a radius is perpendicular to a line on the circle, then that line is a tangent.

**Example 2)** Is $\overbar{MN}$ tangent to circle L? Justify.

**Theorem:** Two segments from the same exterior point that are tangent are congruent.

10.8: Equations of Circles

**Definition of a circle:** The locus of all points in a plane equidistant from a given point.

**General equation of a circle:**

Where the center is located at \_\_\_\_\_\_\_\_\_\_\_ and the radius is \_\_\_\_\_\_

**Ex 1:** (x – 1 )2 + ( y – 7)2 = 25 Center: \_\_\_\_\_\_\_ Radius: \_\_\_\_\_\_

**Ex2:** (x – 4)2 + ( y + 6)2 = 25 Center: \_\_\_\_\_\_\_ Radius: \_\_\_\_\_\_

**Ex3:** x 2 + y 2 = 25 Center: \_\_\_\_\_\_\_ Radius: \_\_\_\_\_\_

**Ex4:**  Center (0, 4) radius = 9 Equation: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Ex 5:**  Center (-3, 7) radius = $\sqrt{15}$ Equation: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Ex 6:**  Center (0, 4) Point on the circle: P(1, 2) Equation: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Ex 7:** Endpoints of the diameter are (-1, 3) and (-5, 7) Equation: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Ex8:** What is the exact circumference of the circle with equation (x – 1 )2 + ( y – 7)2 = 25 ?

**Ex9:** Find the radius of the circle that has the equation (x – 5)2 + ( y – 3)2 = r2 and passes through the point (5, 1)

**Graphing Circles**

1. Locate the center of the circle
2. Use the radius to plot 4 points from the center of the circle
3. Connect the dots into something that looks as “circley” as possible ☺

**Ex10)** Graph (x + 2)2 + ( y – 1)2 = 9 **Ex 11)** Graph x2 + ( y + 1)2 = 16

**Ex12)** Equation: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Circles Day #2: Equations of Circles + Completing the Square!

Write the equation of the following circles in standard form:

**Ex1)** x2 + 2x + y2 = 55 + 10y

**Ex2)** 8x + 32y + y2 = –263 – x2