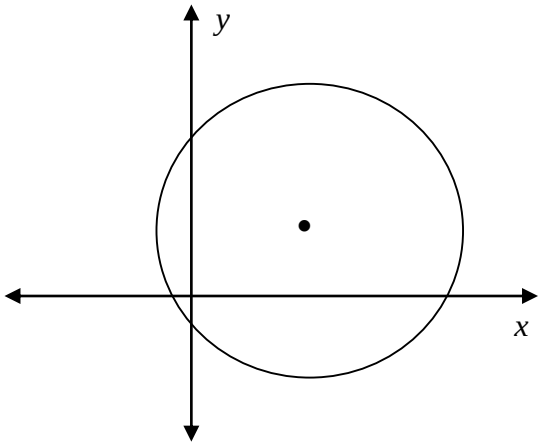
Name:_____ **Date:**_____

Geometry Notes CG - 5: Circles

Review: A circle is a set of points that are

Let the coordinates of the center of a circle by (h, k) and the radius be r. Find the equation of the circle.



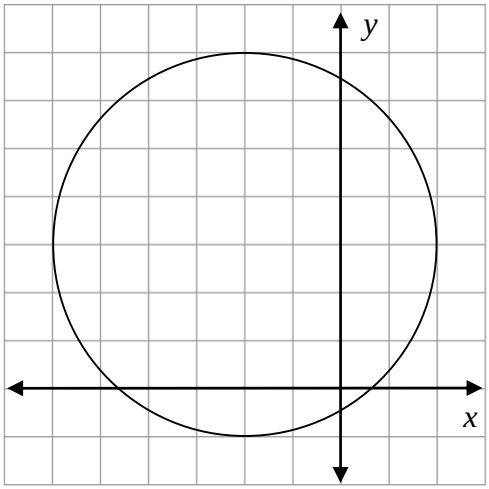
Ex: What is the equation of the circle having center (3, −7) and radius 5?

Ex: What is the equation of the locus of points that are 8 units from the point (−2, 0)?

Ex: What is the equation of a circle with center at the origin and radius r?

Ex: Describe fully the set of points defined by the equation $(x-4)^2+(y+5)^2=36$.

Ex: Write the equation of the circle graphed at right.



Ex: What is the equation of the circle having diameter $\overline{AB}$ with coordinates $A(-1, -5)$ and $B(3, 1)$?

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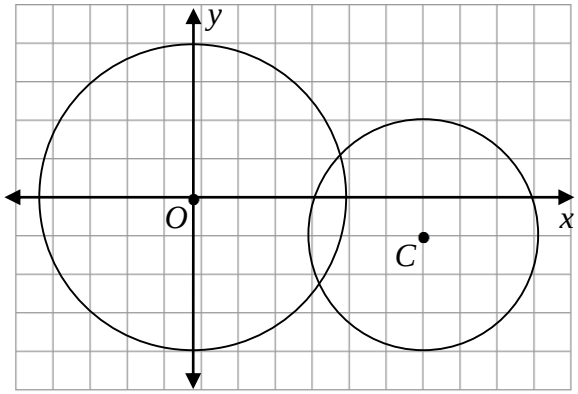
Geometry HW: CG – 5

1. For *each* circle in the diagram at right, identify the
   a. coordinates of the center,
   b. length of the radius, and
   c. equation of the circle.



2. For each of the following circles, find the length of the radius and the coordinates of the center:
   a. $x^2 + y^2 = 36$

   b. $(x - 3)^2 + (y + 12)^2 = 20$

   c. $(x - 2)^2 + y^2 = 12^2$

3. Write equations for the following circles:
   a. Center at the origin; radius 8

   b. Center at (–2, 5); radius $\sqrt{30}$

4. a. Write an equation of the set of all points that are 13 units from the origin.

   b. Tell which of the following points are in the set from part *a*:
   (1) (0, 13) (2) (6, 7) (3) (–5, 12)

5. a. Write the equation of the circle having a diameter with endpoints (–5, 1) and (3, 5).

   b. Find the area of the circle to the nearest tenth.

   c. Find the circumference of the circle to the nearest tenth.

6. Solve the following system of equations graphically: $(x-3)^2 + y^2 = 25$

$$y = \frac{1}{2}x + 1$$

7. a. Graph ΔRAT having vertices $R(-4, 2)$, $A(0, 10)$ and $T(12, 2)$.
   b. The point $C(4, 3)$ is called the *circumcenter* of the circle (more on that later in the course). Show that C is equidistant from all three vertices of ΔRAT. Call that distance r.
   c. Write the equation of the circle having its center at C and radius r. Graph the circle. What is special about this circle?