- Grade Sheets
- Go Over Quiz
- Distance Questions?
- Circle Equations :)

Name: ___Key___

Geometry R: Coordinate Geometry

Show **all formulas and work** on a separate sheet of paper.

$x\ \frac{18}{}$

1. Find an equation of a line with a slope of 2/3 and that passes through the point (-3, 1).

$$y - y = m(x - x)$$
$$\rightarrow y - 1 = \frac{2}{3}(x - (-3))$$
$$y - 1 = \frac{2}{3}(x + 3)$$

$$y - 1 = \frac{2}{3}x + 2$$
$$+1$$
$$\boxed{y = \frac{2}{3}x + 3}$$

2. Write the equation of a line that passes through the points (4, -3) and (-5, 6).

$$y - y = m(x - x)$$
$$\rightarrow y - 6 = -1(x - (-5))$$
$$y - 6 = -1(x + 5)$$

$$y - 6 = -x - 5$$
$$+6$$
$$\boxed{y = -x + 1}$$

$$m = \frac{6 + (+3)}{-5 - 4} = \frac{9}{-9} = -1$$

3. Are these lines parallel? $\begin{array}{l} 5x - 8y = 14 \\ 5x - y = 9 \end{array}$

$$5x - 8y = 14$$
$$\frac{-8y}{-8} = \frac{-5x}{-8} + \frac{14}{-8}$$
$$y = \frac{5}{8}x - \frac{7}{4}$$

$$5x - y = 9$$
$$-y = -5x + 9$$
$$y = 5x - 9$$

Not Parallel

4. Write the equation of a line that is parallel to the line y = 6 and that passes through (-3, 8).

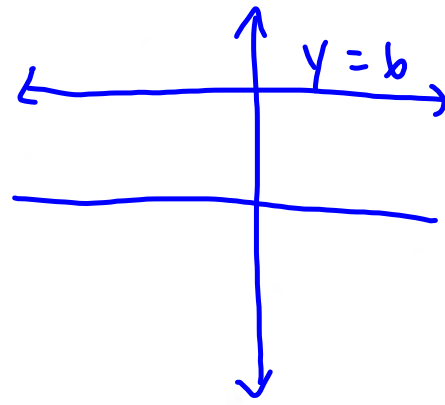$$\boxed{m = 0}$$

$$y - y = m(x - x)$$
$$y - 8 = 0(x - (-3))$$
$$y - 8 = 0(x + 3)$$
$$y - 8 = 0$$
$$\boxed{y = 8}$$

$y = b$

5. Write the equation of a line that is (parallel) to the line $3x - y = -1$ that passes through $(-2, 0)$.

$$-y = -3x - 1$$
$$\frac{-y}{-1} = \frac{-3x}{-1} \frac{-1}{-1}$$
$$y = 3x + 1$$

$$y - 0 = 3(x - (-2))$$
$$y - 0 = 3(x + 2)$$
$$y = 3x + 6$$

6. Write the equation of a line that goes through $(-2, 5)$ and is perpendicular to $2x + 3y = 6$.

$$3y = -2x + 6$$
$$y = -\frac{2}{3}x + 2$$

$$y - 5 = \frac{3}{2}(x - (-2))$$
$$y - 5 = \frac{3}{2}(x + 2)$$

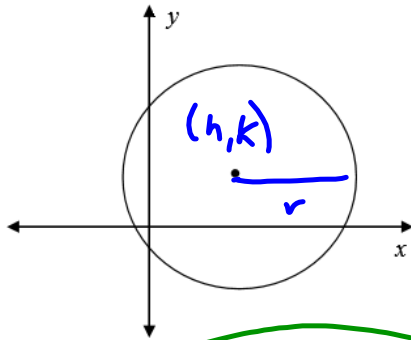$$\frac{1}{?} = \frac{3}{2}$$

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.
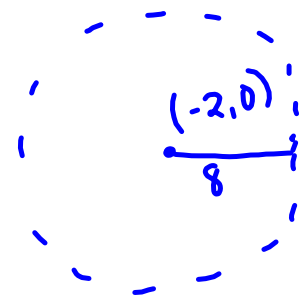
$$(x - h)^2 + (y - k)^2 = r^2$$

Center

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

$$(x - 3)^2 + (y-(-7))^2 = 5^2$$

$$(x - 3)^2 + (y + 7)^2 = 25$$

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

$$(x -(-2))^2 + (y - 0)^2 = 8^2$$

$$(x + 2)^2 + y^2 = 64$$

(-2,0)
8

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

$$(x - 0)^2 + (y-0)^2 = r^2 \quad (0,0)$$

$$x^2 + y^2 = r^2$$

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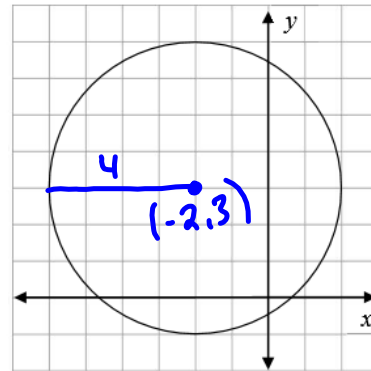
radius

Center
OPP

Center: $(4, -5)$

Radius $= \sqrt{36} = 6$

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

$$(x-(-2))^2 + (y-3)^2 = 4^2$$

$$(x+2)^2 + (y-3)^2 = 16$$

4

$(-2,3)$

$$(1,-2)$$

$(3,1)$

A
$(-1,-5)$
center

B

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

$$M = \left(\frac{x+x}{2}, \frac{y+y}{2} \right)$$

$$= \left(\frac{-1+3}{2}, \frac{-5+1}{2} \right)$$

$$= \left(\frac{2}{2}, \frac{-4}{2} \right)$$

$$= (1, -2)$$

$$(x-1)^2 + (y-(-2))^2 = (\sqrt{13})^2$$

$$(x-1)^2 + (y+2)^2 = 13$$

Radius $d = \sqrt{(x-x)^2 + (y-y)^2}$

$$= \sqrt{(3-1)^2 + (1+(+2))^2}$$
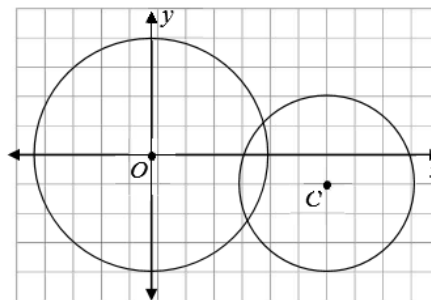
$$= \sqrt{2^2 + 3^2}$$

$$= \sqrt{4+9}$$

$$= \sqrt{13} \quad \leftarrow \text{radius}$$

Name:_____ Date:_____

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.

$$A = \pi r^2$$

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

$$C = \pi d$$

6. Solve the following system of equations graphically: $(x-3)^2 + y^2 = 25$
$$y = \frac{1}{2}x + 1$$

7. a. Graph $\triangle RAT$ 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 $\triangle RAT$. 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?