

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Period ; \_\_\_\_\_

### Circles Worksheet Day #1

Write an equation of a circle given the following information.

	Center	Radius	Equation
1.	(2, -4)	4	_____
2.	(-7, 1)	15	_____
3.	(3, 0)	1/3	_____
4.	(-5, -3)	$3\sqrt{2}$	_____

Write an equation of each circle described below. Show work!

5. Given a circle with center (3, -4) and passing through (6, 2).
6. Given a circle with the center (5, 1) and a point on the circle (8, -2).
7. Given a circle with the center at the origin and passing through (4, 3).

Extension (*Hint: find the coordinates of the center first*)

8. Given a circle with (5, 1) and (3, -1) as the endpoints of the diameter.
9. Given a circle with (2, 1) and (6, -3) as the endpoints of the diameter.
10. Given a circle with (4, -3) and (2, 1) as the endpoints of the diameter.

# Circles – Notes Day 1

**General Form of the Equation of a Circle:**

$$( \quad - \quad )^2 + ( \quad - \quad )^2 = \underline{\quad}^2$$

Center: (  $\quad$  ,  $\quad$  ) and radius =  $\underline{\quad}$

Given the **center and radius**, write the equation.

1. **C (5, 2) r = 7**

$$( \quad - \quad )^2 + ( \quad - \quad )^2 = \underline{\quad}^2$$

Equation: \_\_\_\_\_

2. **C (-3, 4) r =  $2\sqrt{5}$**

$$( \quad - \quad )^2 + ( \quad - \quad )^2 = \underline{\quad}^2$$

Equation: \_\_\_\_\_

Given the **center and another point on the circle**, write the equation.

To find  $r^2$  either plug in the point or use the distance formula,  $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ .

3. **C (4, -7) and (5, 3)**

$$( \quad - \quad )^2 + ( \quad - \quad )^2 = \underline{\quad}^2$$

Equation: \_\_\_\_\_

Find  $r^2$  by plugging in the point (  $\quad$  ,  $\quad$  ):

4. **C origin and (-5, 2)**

$$( \quad - \quad )^2 + ( \quad - \quad )^2 = \underline{\quad}^2$$

Equation: \_\_\_\_\_

Find  $r^2$  using the distance formula:

## Circles Notes Day 2

### Part 1: Rewriting equation in standard form

If the quadratic equation isn't in the standard form for a circle:

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

we must first **complete the square** to get it in the correct form.

1.  $x^2 + y^2 + 16x - 22y - 20 = 0$

#### Steps to complete the square.

First, prepare the terms:

- ✓ Group \_\_\_\_\_ and leave a space.
- ✓ Group \_\_\_\_\_ and leave a space.
- ✓ Move the constant and leave \_\_\_\_\_.

Then, complete the square:

- ✓  $\frac{1}{2}$  the linear term and square it.
- ✓ Add to both sides.
- ✓ Do this for both x and y.
- ✓ Factor and simplify.

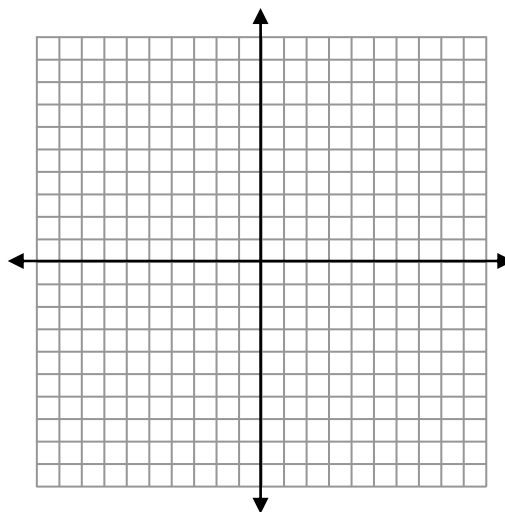
2.  $x^2 + y^2 - 12x + 8y + 32 = 0$

## Part 2: Graphing Circles

1.  $(x)^2 + (y)^2 = 36$

$C = ( \quad , \quad )$

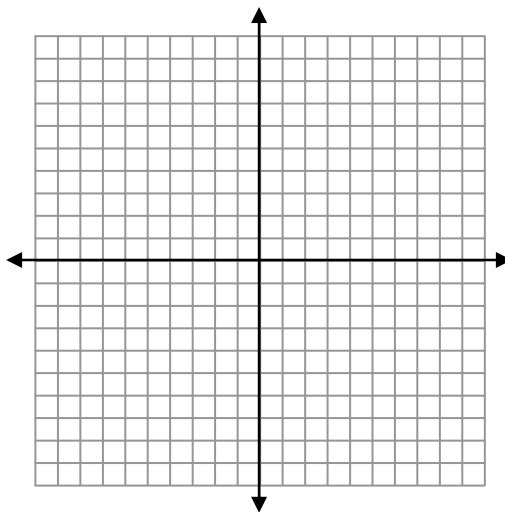
$r = \underline{\hspace{2cm}}$



2.  $(x-3)^2 + (y-4)^2 = 25$

$C = ( \quad , \quad )$

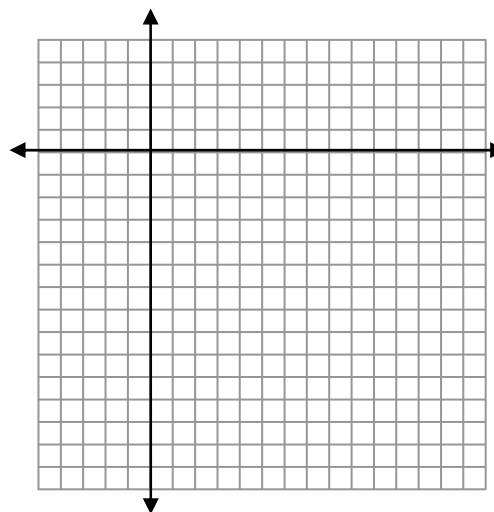
$r = \underline{\hspace{2cm}}$



3.  $(x-5)^2 + (y+4)^2 = 41$

$C = ( \quad , \quad )$

$r = \underline{\hspace{2cm}}$



Name \_\_\_\_\_

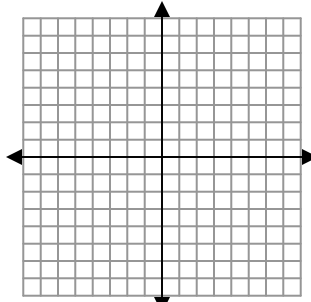
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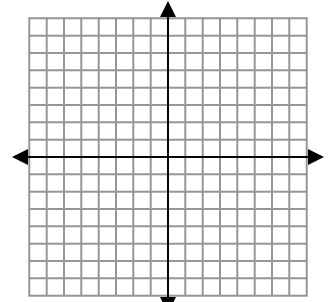
## Circles Worksheet Day #2

Put each equation in standard form and graph the circle.

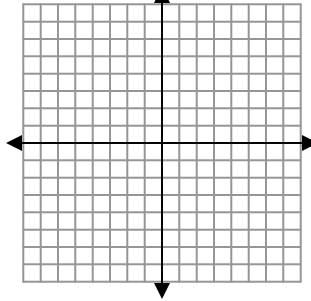
1.  $x^2 = 9 - y^2$



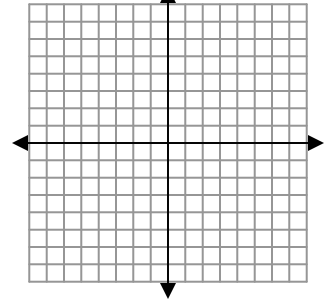
2.  $2x^2 + 2y^2 - 8 = 0$



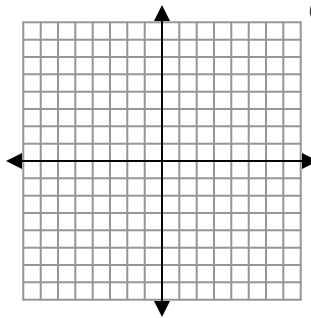
3.  $x^2 + y^2 + 4y + 4 = 9$



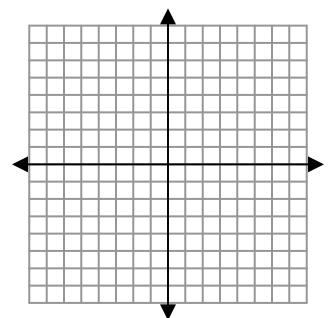
4.  $x^2 + 6x + y^2 = 7$



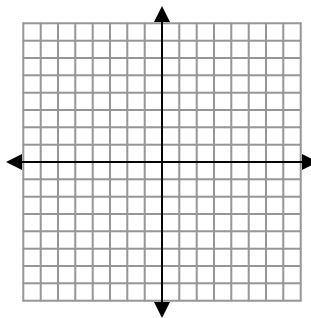
5.  $y^2 + x^2 + 4x - 4y - 1 = 0$



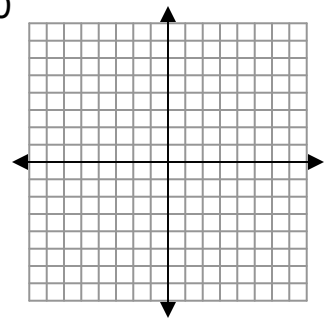
6.  $5x^2 + 20x + 5y^2 = 35$



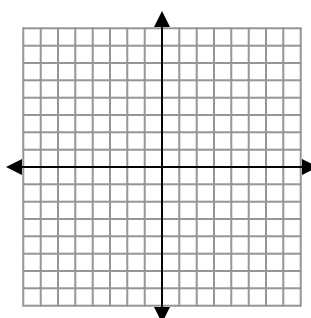
7.  $4x^2 + 4y^2 + 32y - 36 = 0$



8.  $x^2 + y^2 - 3x + 8y = 20$



9.  $x^2 - 12x + 84 = -y^2 + 16y$



10.  $x^2 + y^2 + 2x + 4y = 11$

