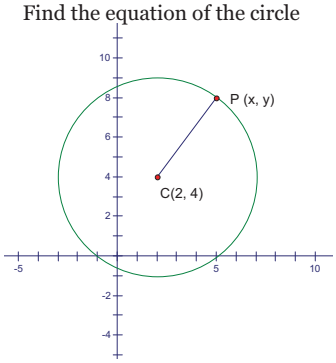
The set of all points *P (x, y)* in the plane that are 5 unit from the point *C*(2, 4) is a *circle*

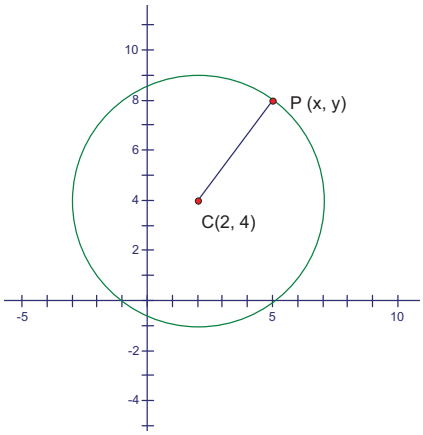
Find the equation of the circle



Use your Distance Formula!!

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

What do you know that the distance of *CP* has to be?



In General

If *P (x, y)* is on the circle with center *C (h, k)* and radius *r*, then:

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

Write the equation of the circle:

- Center (0, 0) and Radius = 4
- Center (-1, 7) and Radius = 3
- Center (4, -4) and Radius = 9
- Center (-3, -10) and Radius = 6

Find the Center and Radius for each of the following 4 equations

$$(x-4)^2+(y-2)^2=16$$
$$(x+5)^2+(y-1)^2=20$$
$$(x-9)^2+y^2=48$$
$$x^2-6x+y^2+20y+84=0$$

$$x^2-6x+y^2+20y+84=0$$

We need to COMPLETE THE SQUARE!!!

Name: _____ Date: _____

Period: _____ Pre-Calculus: 6.2 Circles Extra Practice

Directions: Complete the square for the following conics in standard form. After writing the equation in (h, k) form, identify the center, radius, and draw a sketch.

Follow these steps!!

1. Group like terms together and move the constant to the other side.
2. Complete the square for x and y. (Take half of the coefficient of x and y, square it, and add it to both sides) *You may not always complete the square for both x and y!
3. Factor each perfect square trinomial to a binomial squared.
4. Identify the center, radius, and draw a sketch of the graph.

EXAMPLE :

$x^2 - 6x + y^2 + 20y + 84 = 0$

$x^2 - 6x \quad + y^2 + 20y \quad = -84$

$x^2 - 6x + 9 + y^2 + 20y + 100 = -84 + 9 + 100$

$x^2 - 6x + 9 + y^2 + 20y + 100 = 25$

$(x-3)^2 + (y+10)^2 = 25$

Center : $(3,-10)$

Radius : 5

1. $x^2 - 8x + y^2 - 2y + 13 = 0$

2. $x^2 + 6x + y^2 - 7 = 0$

3. $x^2 + y^2 - 100 = 0$

4. $x^2 + 8x + y^2 + 14y + 55 = 0$

5. $x^2 + 10x + y^2 - 2y - 118 = 0$

6. $x^2 - 12x + y^2 - 4y + 4 = 0$

7. $x^2 + 10x + y^2 - 14y + 49 = 0$

8. $x^2 - 18x + y^2 - 6y + 9 = 0$

9. $x^2 + 4x + y^2 + 12y + 39 = 0$

10. $x^2 - 16x + y^2 + 24y + 199 = 0$