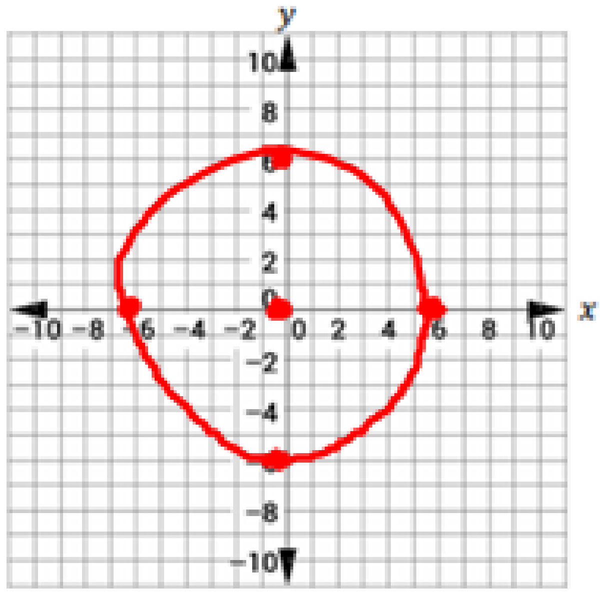
$(x-h)^2+(y-k)^2=r^2$

(h,k) $r=$ Radius

Graph the equation $x^2 + y^2 = 36$.



$(0,0)$

$r=6$

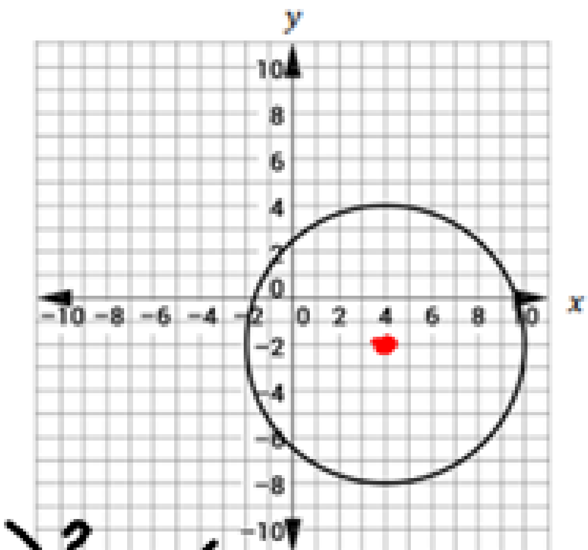
$$(x-h)^2+(y-k)^2=r^2$$

$$(x-4)^2+(y--2)^2=6^2$$

Write the equation of the graphed circle.

$(4,-2)$

$r=6$



$$(x-4)^2+(y+2)^2=36$$

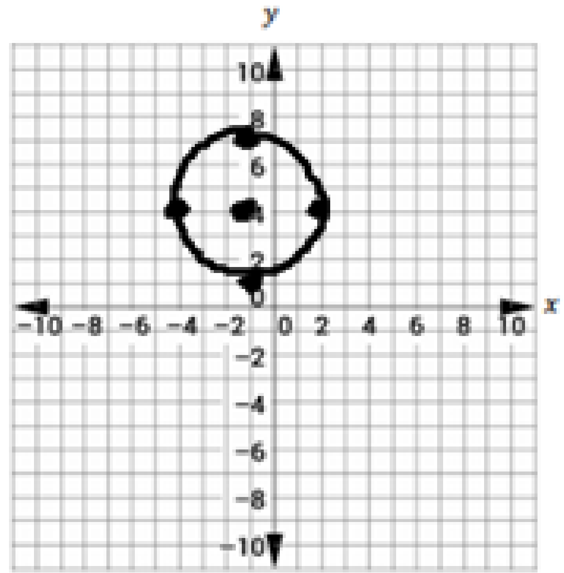
$(x-h)^2+(y-k)^2$

4. Graph each equation.

a. $(x+1)^2+(y-4)^2=9$

$(-1,4)$

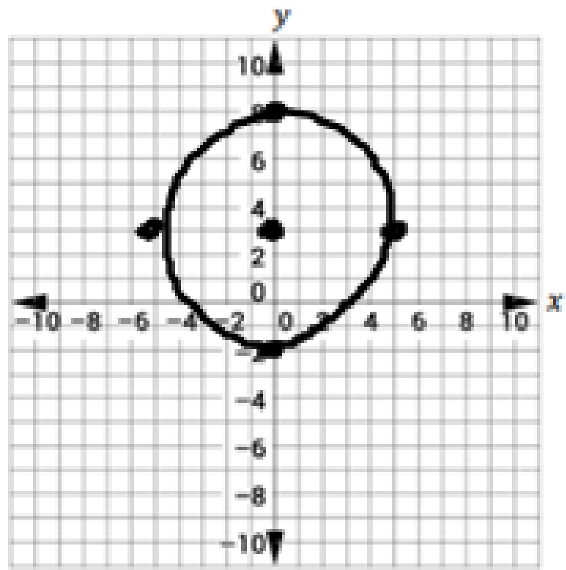
$r=3$



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

$(0,3)$

$r = 5$

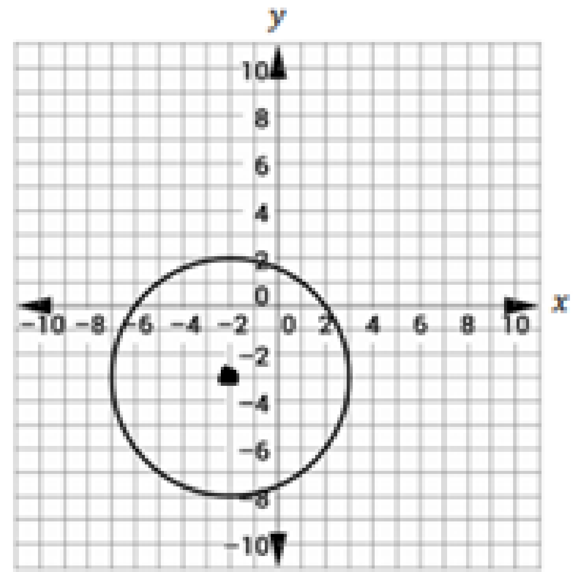


$$(x+2)^2+(y+3)^2=25$$

Write the equation of the graphed circle.

$(-2,-3)$

$r=5$



Informal Assessment:

Let $(5, -7)$ be the center of the circle and (x, y) be any point on the circle. Then, the horizontal distance from (x, y) to the center is

- ● $|x - 5|$.
- ○ $|x + 5|$.
- ○ $|x - 7|$.
- ○ $|x + 7|$.

radius = 4

The vertical distance from (x, y) to the center is

- ○ $|y - 5|$.
- ○ $|y + 5|$.
- ○ $|y - 7|$.
- ● $|y + 7|$.

The distance from (x, y) to the center is

- ○ 2.
- ● 4.
- ○ 12.
- ○ 16.

Finally, the

- ○ perimeter formula
- ● Pythagorean Theorem
- ○ quadratic formula
- ○ slope formula

can now be used to create an equation that shows the relationship between the horizontal distance, vertical distance, and distance of (x, y) to the center of the circle.

Consider the equation written in general form.

$x^2 + y^2 - 10y = 119$. How can we use completing the square to show that the equation resembles a circle?

$$x^2 + y^2 - 10y = 119$$

$$x^2 + y^2 - 10y + \left(\frac{-10}{2}\right)^2 = 119 + \left(\frac{-10}{2}\right)^2$$

$$x^2 + y^2 - 10y + 25 = 119 + 25$$

$$x^2 + (y-5)^2 = 144$$

Complete the square to transform the equation to standard form.
What is the center and the radius of the circle? Graph it.

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

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

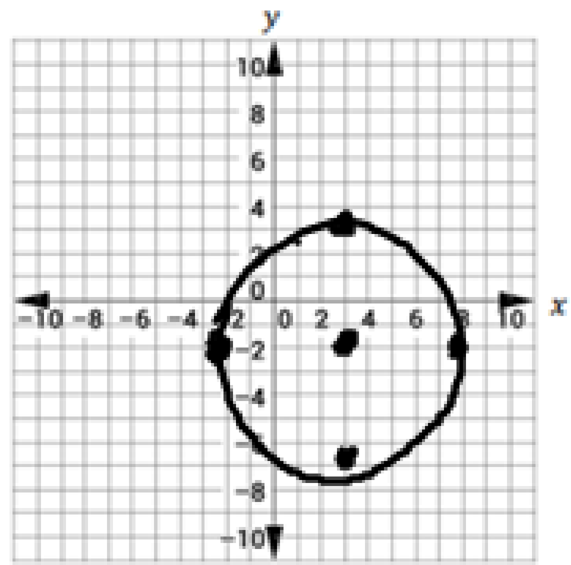
$x^2 - 6x + \left(\frac{-6}{2}\right)^2 +$

$y^2 + 4y + \left(\frac{4}{2}\right)^2 =$

$12 + \left(\frac{-6}{2}\right)^2 + \left(\frac{4}{2}\right)^2$

$x^2 - 6x + 9 + y^2 + 4y + 4 = 12 + 9 + 4$

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



$(3, -2)$

$r = 5$