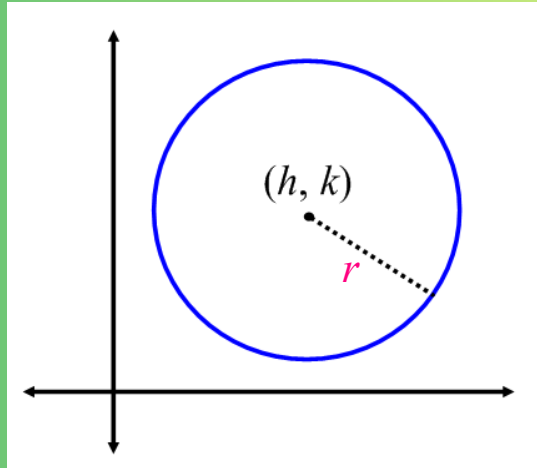


EQUATIONS OF CIRCLES

The standard equation for a circle with its center at (h, k) and a radius of r is $(x - h)^2 + (y - k)^2 = r^2$.



Example 1

Write an equation for a circle with...

a) center $(-3, 6)$ and a radius of 2 units

$$(x - (-3))^2 + (y - 6)^2 = 4$$

b) center $(4, -1)$ and a radius of 5 units

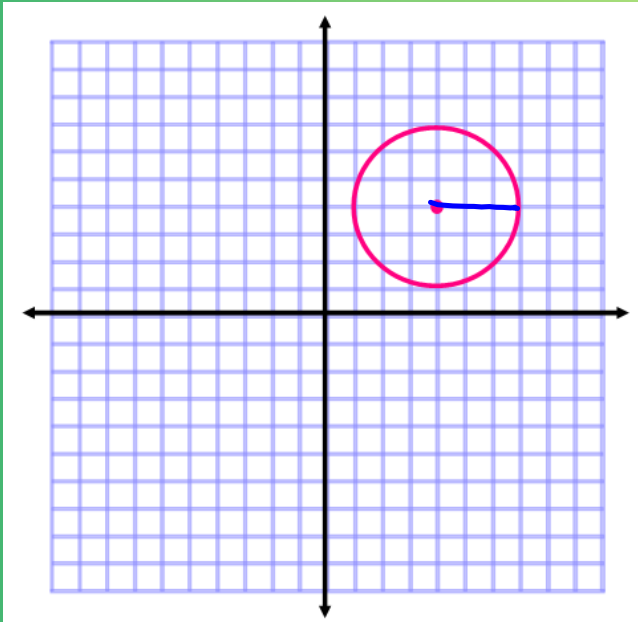
$$(x - 4)^2 + (y + 1)^2 = 25$$

c) center $(-2, -8)$ and a diameter of 18 units

$$(x + 2)^2 + (y + 8)^2 = 81$$

Example 2

Give the coordinates of the center and the length of the radius. Then write an equation for the circle.



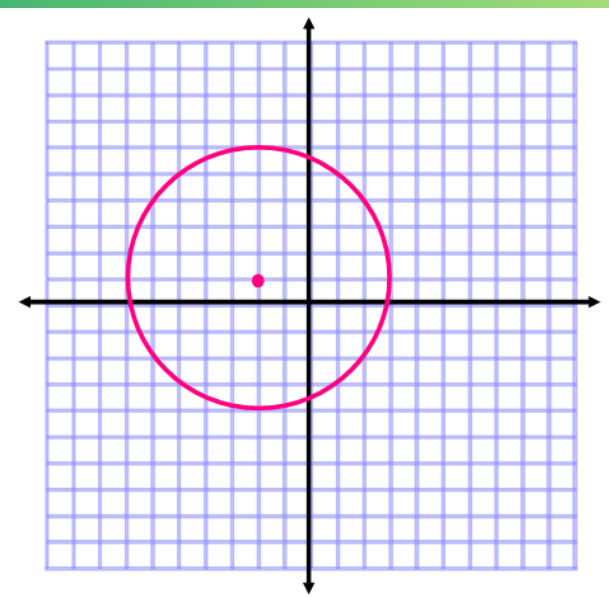
$$\text{center } (4, 4)$$

$$r = 3$$

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

Example 3

Give the coordinates of the center and the length of the radius. Then write an equation for the circle.



$$\text{center } (-2, 1)$$

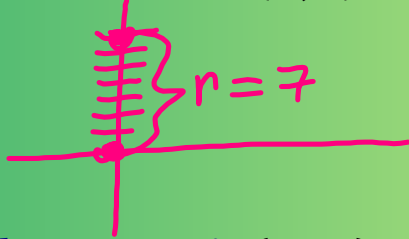
$$r = 5$$

$$(x + 2)^2 + (y - 1)^2 = 25$$

Example 4

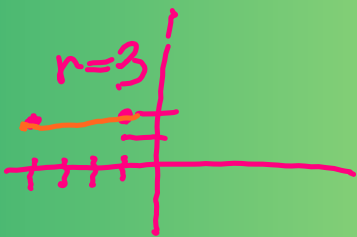
Use the given information to write the standard equation of the circle.

- a) The center is $(0,0)$ & a point on the circle is $(0,7)$.



$$x^2 + y^2 = 49$$

- b) The center is $(-4,2)$ & a point on the circle is $(-1,2)$.



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

Example 5

Use the given information to write the standard equation of the circle.

- a) The center is $(7,3)$ & a point on the circle is $(7,-1)$.

$$(x-7)^2 + (y-3)^2 = 16$$

$$r=4$$

- b) The center is $(-5,-1)$ & a point on the circle is $(-5,-6)$.

$$(x+5)^2 + (y+1)^2 = 25$$

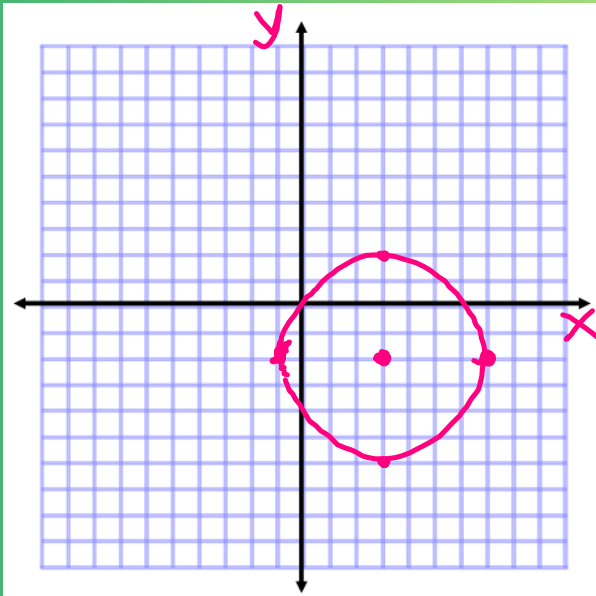
$$r=5$$

Example 6

Give the center and radius of the circle. Then graph.

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

$$h = 3 \quad k = -2$$
$$\text{center: } (3, -2)$$
$$r = 4$$



Example 7

Give the center and radius of the circle. Then graph.

$$(x + 4)^2 + (y - 1)^2 = 49$$

$$\text{center } (-4, 1)$$

$$r = 7$$

