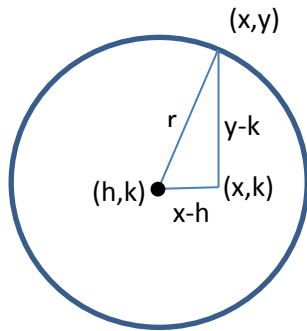


1. A circle of radius r has a center at point (h, k) and includes the point (x, y) . Find the distance from the point (h, k) to the point (x, y) . Then explain how this equation relates to the equation of a circle. A picture may be helpful.



$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ $r = \sqrt{(x - h)^2 + (y - k)^2}$	First I substituted the coordinates of my points into the distance formula. This gave me the length of r , which is the radius of the circle drawn.
$r^2 = (x - h)^2 + (y - k)^2$	Then I squared both sides of the equation. That gave me the standard form of an equation of a circle with a center at (h, k) and a radius of r .

2. Write the equation for a circle with a center at $(-3, 2)$ and a radius of 4.

$(x - h)^2 + (y - k)^2 = r^2$	ALWAYS write down the formula or equation.
$(x - -3)^2 + (y - 2)^2 = 4^2$	Then substitute the given information into the equation. ($h = -3, k = 2, r = 4$)
$(x + 3)^2 + (y - 2)^2 = 16$	Then simplify where possible.

3. Identify the center and radius for the following circle. $(x - 5)^2 + (y + 4)^2 = 50$

I am comparing the given equation with the standard equation:

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

When I do this, I have to remember that the minus sign is part of the standard equation. That means in $(x-5)^2$, the h -value is 5. In $(y+4)^2$, I have to think of it as $(y- -4)^2$ to understand why the k -value is -4 . So the center is $(5, -4)$. The radius is found by square rooting r^2 . Here that means the radius would be $\sqrt{50}$. I can simplify this answer by factoring 50 into $25 \cdot 2$. Then $\sqrt{50} = \sqrt{25 \cdot 2} = \sqrt{25} \cdot \sqrt{2}$ or $5\sqrt{2}$.

Additional Practice:

1. Write an equation in standard form for a circle with a center at $(3, 5)$ and a radius of 6.
2. Now write an equation in standard form for a circle with a center at $(-3, 5)$ and a radius of 6.
3. What did you have to change in the equation when the center was at -3 instead of 3 ?
4. Find the center and radius of the circle formed by the equation: $(x - 2)^2 + (y - 3)^2 = 9$
5. Find the center and radius of the circle formed by the equation: $(x + 4)^2 + (y + 2)^2 = 9$
6. Find the center and radius of the circle formed by the equation: $(x - 2)^2 + (y + 3)^2 = 2$