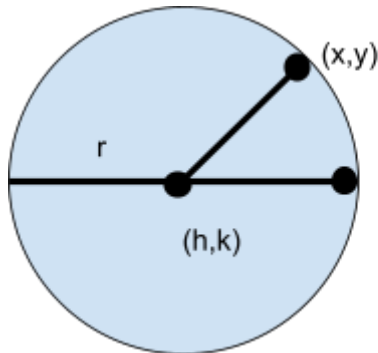Name:_____

Date:_____

<u>Equations of a Circle</u>

What is the equation of a circle with any center? When C= (h,k)

R= Radius



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

Distance equation=$(\sqrt{(x - h)^2 + (y - k)^2})$=r

Now, we can square both sides to get rid of the square root on the left.

$$(\sqrt{(x - h)^2 + (y - k)^2})^2 = (r)^2$$

After doing this, we get the equation of a circle

Equation of a circle: $(x - h)^2 + (y - k)^2 = r^2$

**ON DESMOS:**

-We will type in our equation like it is above into the first line on Desmos, it will look like this:

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

add slider: $h$    $k$    $r$    all

-Now, since we have variables and not a specific center or radius we need to add sliders to ALL. Once we do this, the left side of the graph will now look like the following.



With these sliders we can adjust where the circle lays on the graph. With the H and K sliders it adjusts the center point of the graph so for the sliders inserted above the center point is (1,1). The r value slider adjusts the radius and how big the circle gets, for the sliders inserted above the radius is 1. Below, is what the graph will look like with these given slider adjustments.
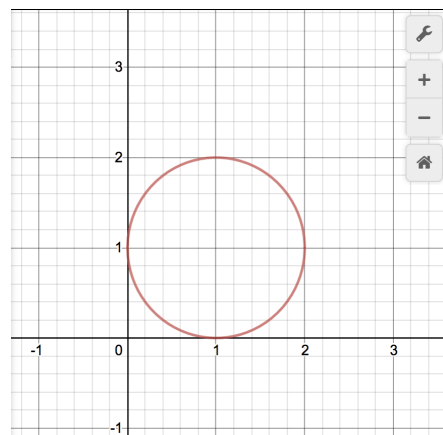
Using Desmos, we can also graph equations with a specific center point and radius. Let's try the following.
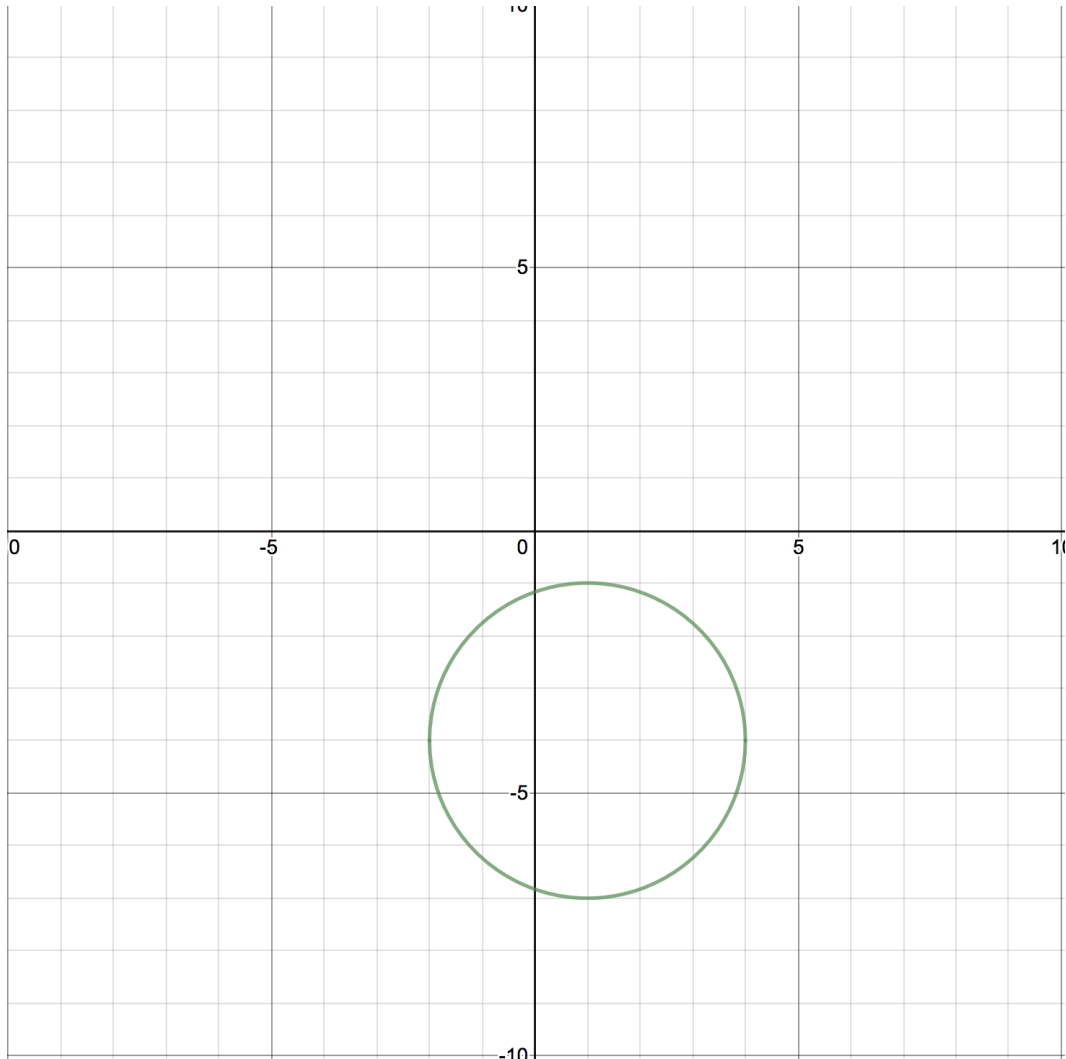
$$(x - 1)^2 + (y + 4)^2 = 9$$

We can determine the following:
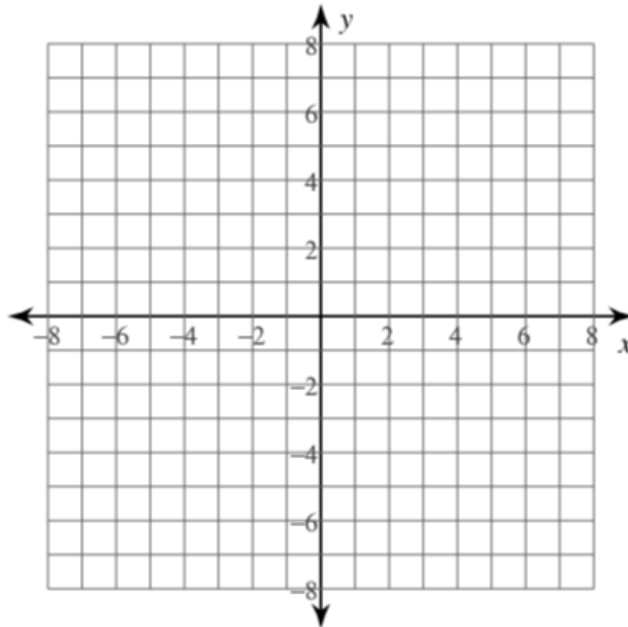
Center Point: **(1,-4)**

Radius: **3**

Now, we can type our equation into the first line on Desmos and see how the graph is created.

Practice Problems:

1. $(x - 1)^2 + (y + 3)^2 = 4$

-Create the graph on Desmos
-Copy the graph onto the graph provided below
-Determine the center of the circle
-Determine the radius of the circle



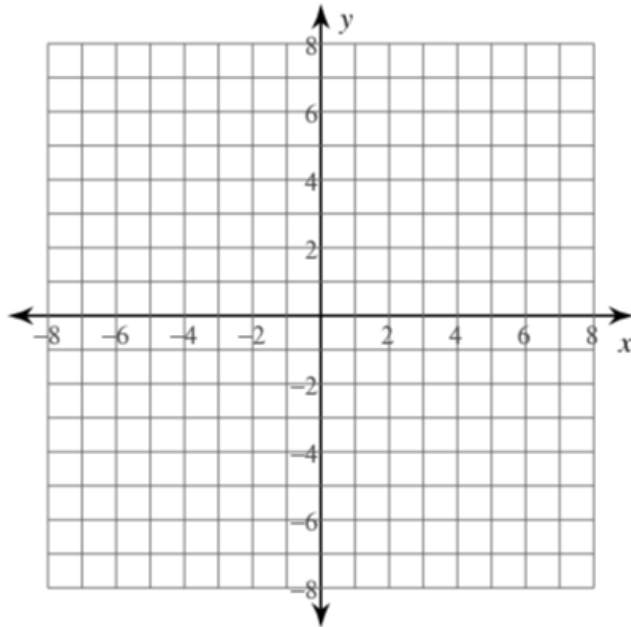Center: _____

Radius: _____

2. $(x - 2)^2 + (y + 1)^2 = 16$

-Create the graph on Desmos

-Copy the graph onto the graph provided below

-Determine the center of the circle

-Determine the radius of the circle



Center: _____

Radius: _____