

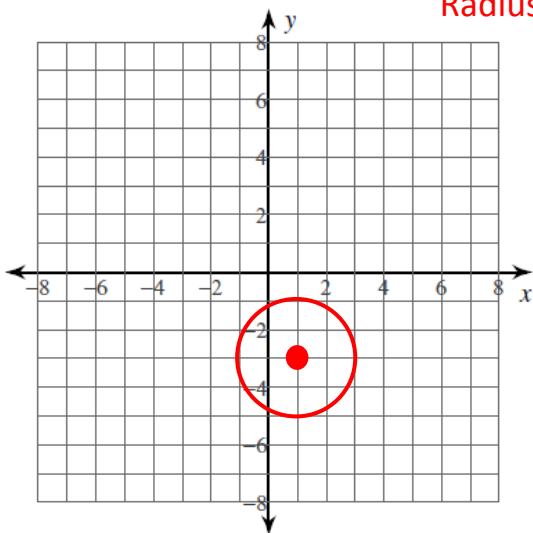
Equations of Circles: [http://www.geogebra.org/en/upload/files/UC\\_MAT/Equation\\_of\\_Circles.html](http://www.geogebra.org/en/upload/files/UC_MAT/Equation_of_Circles.html)

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

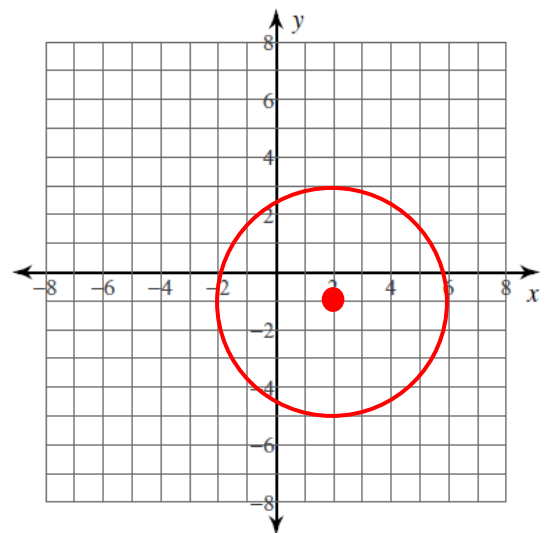
Where (h, k) is center and r is radius

Graph the circle given by each equation below.

1)  $(x - 1)^2 + (y + 3)^2 = 4$  Center: (1, -3)  
Radius: 2



2)  $(x - 2)^2 + (y + 1)^2 = 16$  Center: (2, -1)  
Radius: 4



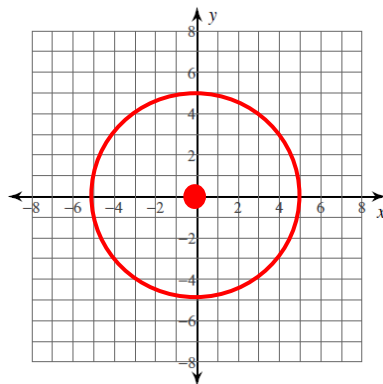
Use the information provided to write the equation of a circle that fits the criteria given. Use a graph to help you if necessary.

3) Center: (0, 0) Radius = 5

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

$$(x - 0)^2 + (y - 0)^2 = 5^2$$

$$x^2 + y^2 = 25$$



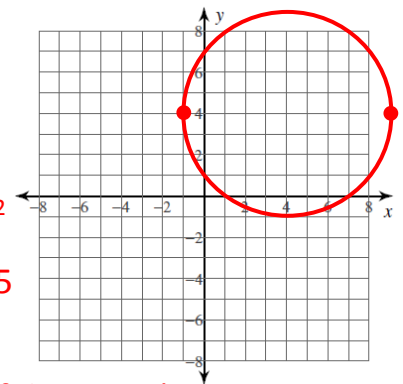
4) Ends of the diameter: (9, 4) and (-1, 4)

Center: (4, 4)

Radius: 5

$$(x - 4)^2 + (y - 4)^2 = 5^2$$

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



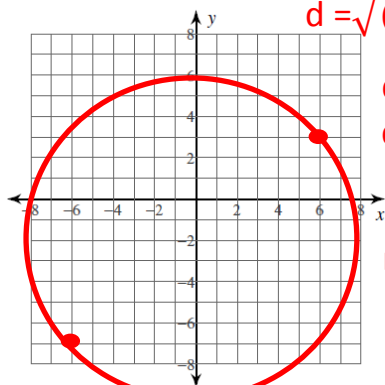
\*Center is midpoint of diameter\*

\*Radius = half of diameter\*

Distance between is the radius of circle

5) Ends of the diameter: (6, 3) and (-6, -7)

$$d = \sqrt{(-7 - 3)^2 + (-6 - 6)^2}$$



$$d = \sqrt{10^2 + 12^2}$$

$$d = \sqrt{244}$$

$$r = \frac{\sqrt{244}}{2}$$

Center  $\rightarrow$  midpoint of diameter

$$\left(\frac{6+(-6)}{2}, \frac{3+(-7)}{2}\right)$$

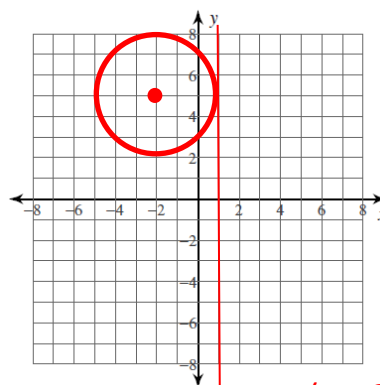
$$(0, -2)$$

$$(x - 0)^2 + (y + 2)^2 = \left(\frac{\sqrt{244}}{2}\right)^2$$

$$x^2 + (y + 2)^2 = \frac{244}{4}$$

$$x^2 + (y + 2)^2 = 61$$

6) Center: (-2, 5) Tangent to  $x = 1$

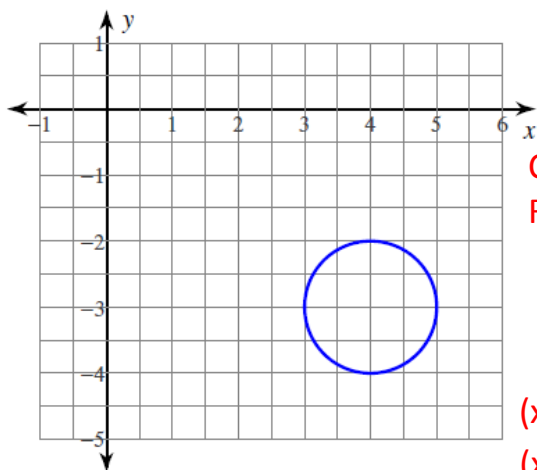


$$r = 3$$

$$(x + 2)^2 + (y - 5)^2 = 3^2$$

$$(x + 2)^2 + (y - 5)^2 = 9$$

7) Write the equation of each graphed circle or the circle in the description.



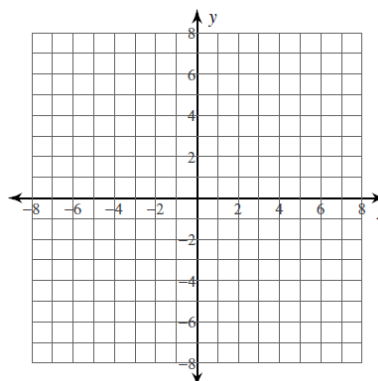
Center: (4, -3)

Radius: 1

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

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

8) Translate the circle  $(x + 5)^2 + (y + 7)^2 = 36$  up 6 and right 2.



Old Center:

(-5, -7)

+2 +6

New Center:

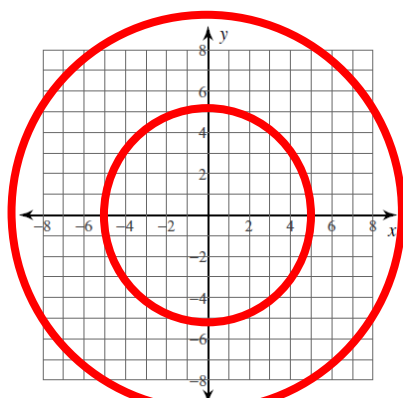
(-3, -1)

Radius: 6

$$(x + 3)^2 + (y + 1)^2 = 36$$

Use what you know about the equation of a circle to answer the following questions.

10) Suppose that a dart is tossed at random onto the graph of  $x^2 + y^2 = 100$ . What is the probability that it will land within the graph of  $x^2 + y^2 = 25$ ?



Center: (0, 0)

Radius: 5

Center: (0, 0)

Radius: 10

$$\text{Probability} = \frac{\text{success region}}{\text{total region}} = \frac{\pi(5)^2}{\pi(10)^2} = \frac{25\pi}{100\pi} = \frac{1}{4}$$