

**10 - 8**

# **Equations of Circles**

## Equation of a Circle:

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

$x, y$  stay

$(h, k)$  center

$r$ : radius

**Ex: Find the center and radius.**

$$(x - 2)^2 + (y + 4)^2 = 16$$

Center:  $(2, -4)$

radius: 4

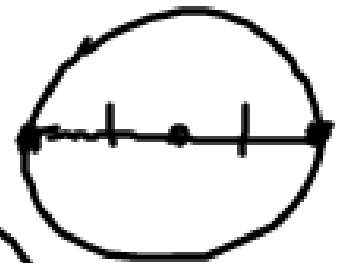
**Write the equation for each circle...**

**Ex: center (- 3, 6) , radius  $(\sqrt{5})^2$**

$$(x + 3)^2 + (y - 6)^2 = 5$$

Write the equation for each circle...

Ex: diameter has endpoints  
(-7, -2) and (-15, 6)



center:  $(-11, 2)$   $\left( \frac{-7 + -15}{2}, \frac{-2 + 6}{2} \right)$

radius:  $\sqrt{32}$   $(-11, 2)$

$$d = \sqrt{(-11 + 7)^2 + (2 + 2)^2}$$

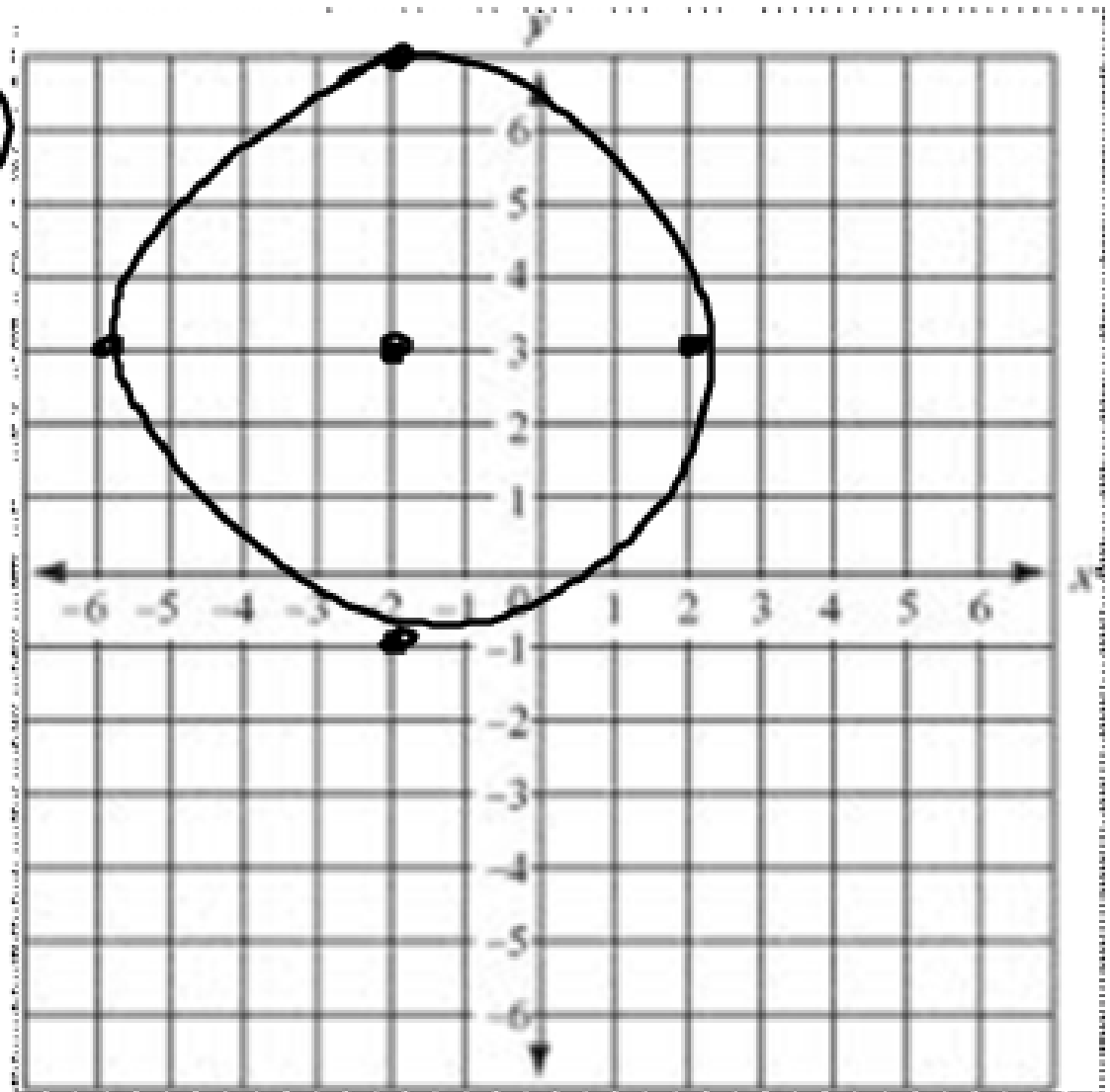
$$\sqrt{16 + 16} = \sqrt{32}$$

$$\boxed{(x + 11)^2 + (y - 2)^2 = 32}$$

Ex: Graph  $(x + 2)^2 + (y - 3)^2 = \sqrt{16}$ .

center:  $(-2, 3)$

radius: 4



Ex: Graph  $x^2 + y^2 = 9$ .

$$(x - 0)^2 + (y - 0)^2 = 9$$

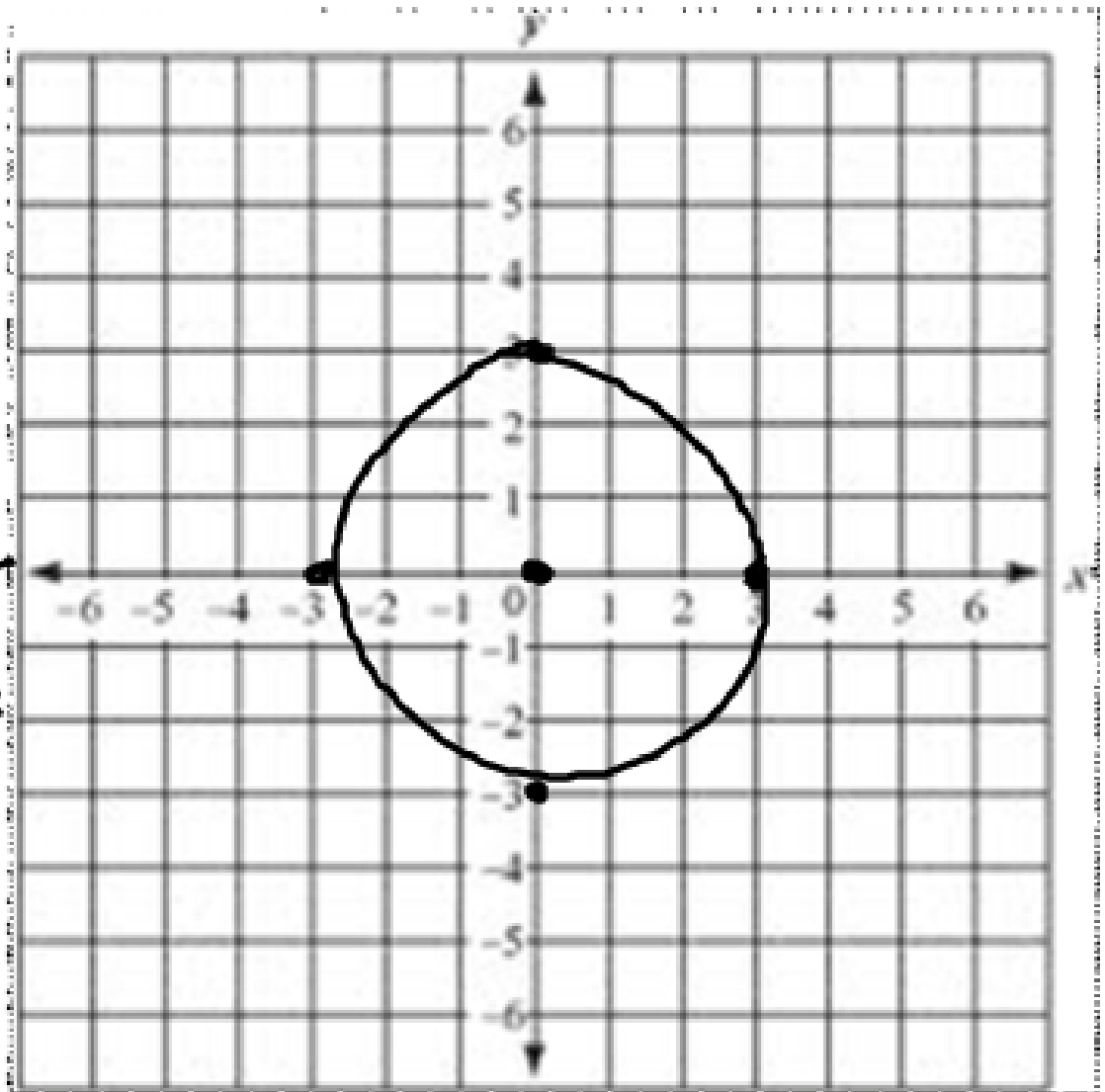
$$(0, 0)$$

$$r = 3$$

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$$(x - 0)^2 + (y + 3)^2 =$$

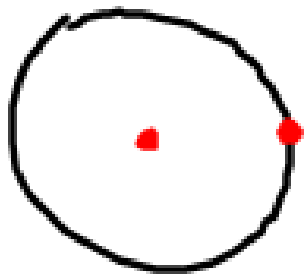
$$x^2 + (y + 3)^2 =$$



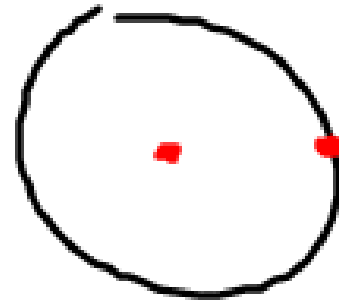
midpoint  $\left(\frac{x+x}{2}, \frac{y+y}{2}\right)$

distance  $d = \sqrt{(x-x)^2 + (y-y)^2}$

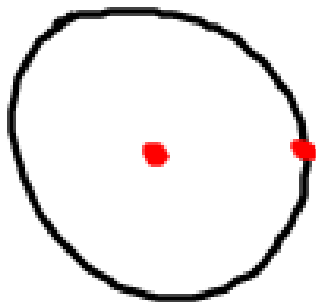
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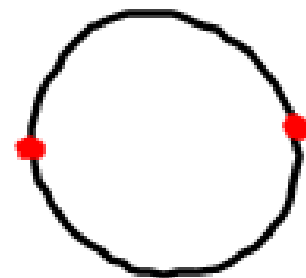
8.)



9.)



10.)







Homework:

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