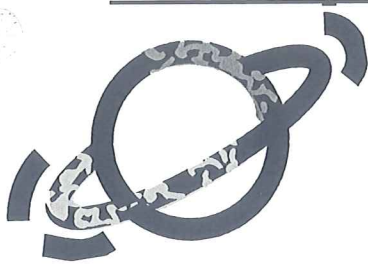


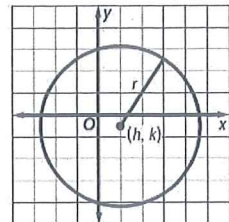
Name: Key

10-8 Equations of Circles: HW



Equation of a Circle A circle is the locus of points in a plane equidistant from a given point. You can use this definition to write an equation of a circle.

Standard Equation of a Circle An equation for a circle with center at (h, k) and a radius of r units is $(x - h)^2 + (y - k)^2 = r^2$.

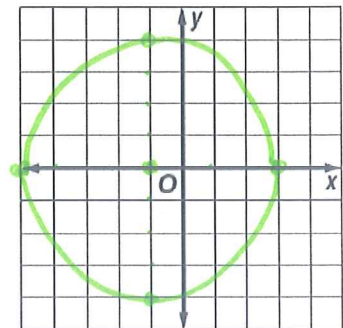


Write the equation for each circle, then graph each.

1. Center at $(-1, 0)$, $r = 4$

$$(x - -1)^2 + (y - 0)^2 = 4^2$$

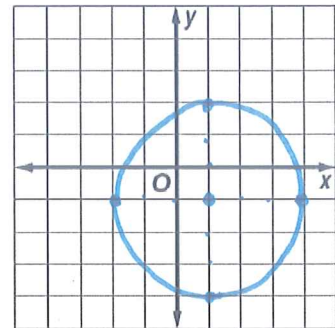
$$(x + 1)^2 + y^2 = 16$$



2. Center at $(1, -1)$, $r = 3$

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

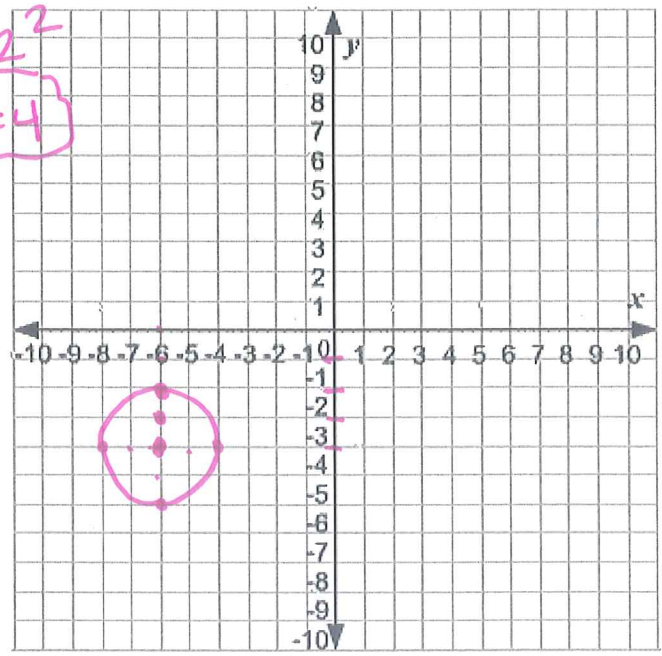
$$(x - 1)^2 + (y + 1)^2 = 9$$



3. Center at $(-6, -4)$, $r = 2$

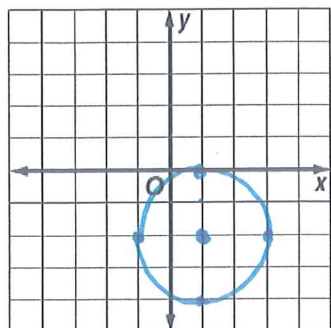
$$(x - -6)^2 + (y - -4)^2 = 2^2$$

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



Find the center and the radius and graph each equation.

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

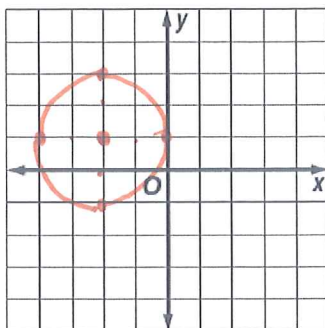


Center: $(1, -2)$

$r = \sqrt{4}$

$r = 2$

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

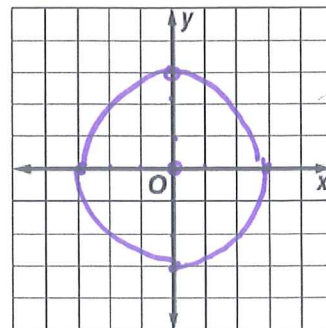


Center: $(-2, 1)$

$r = \sqrt{4}$

$r = 2$

6. $x^2 + y^2 = 9$



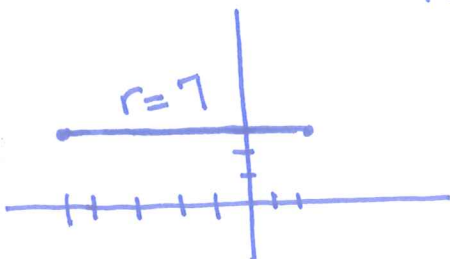
Center: $(0, 0)$

$r = \sqrt{9}$

$r = 3$

7. Write the equation of a circle with the center at $(-5, 3)$ and a radius with the endpoint $(2, 3)$.

$r = 7$



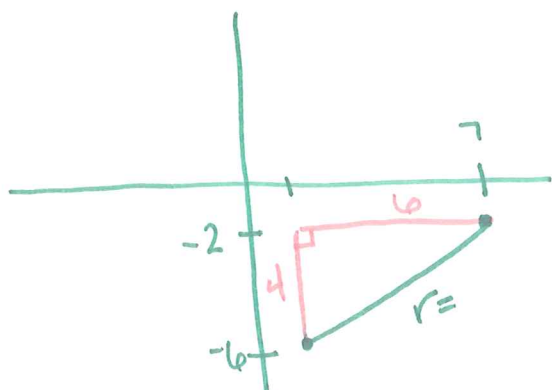
$(x - (-5))^2 + (y - 3)^2 = 7^2$
 $(x + 5)^2 + (y - 3)^2 = 49$

8. Write the equation of a circle with the center at $(-2, -7)$ and a radius with the endpoint $(0, 7)$.

$r = 2$

$(x - (-2))^2 + (y - (-7))^2 = 2^2$
 $(x + 2)^2 + (y + 7)^2 = 4$

9. Write the equation of a circle with the center at $(7, -2)$ and a radius with the endpoint $(1, -6)$.



Find radius: $(x - 7)^2 + (y - (-2))^2 = (2\sqrt{13})^2$
 $4^2 + 6^2 = r^2$
 $16 + 36 = r^2$
 $52 = r^2$
 $\sqrt{52} = r$
 $2\sqrt{13} = r$
 $(x - 7)^2 + (y + 2)^2 = 52$

10. Write the equation of a circle whose diameter has endpoints (4,6) and (-2,6).

$$d=6 \quad r=3$$

$$(x-1)^2 + (y-6)^2 = 9$$

Find center: midpoint

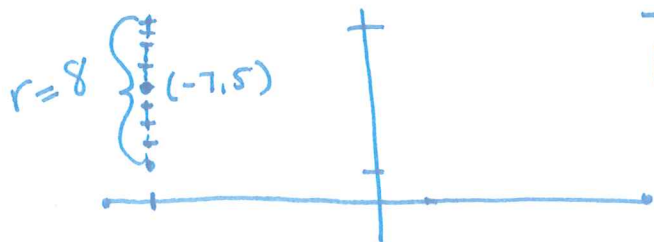
$$\left(\frac{4+(-2)}{2}, \frac{6+6}{2}\right) = \left(\frac{2}{2}, \frac{12}{2}\right)$$

$$C(1, 6)$$

11. Write the equation of a circle whose diameter has endpoints (-7,1) and (-7,9).

Find the center:

$$\left(\frac{-7+(-7)}{2}, \frac{1+9}{2}\right) = \left(-\frac{14}{2}, \frac{10}{2}\right)$$



$$C(-7, 5)$$

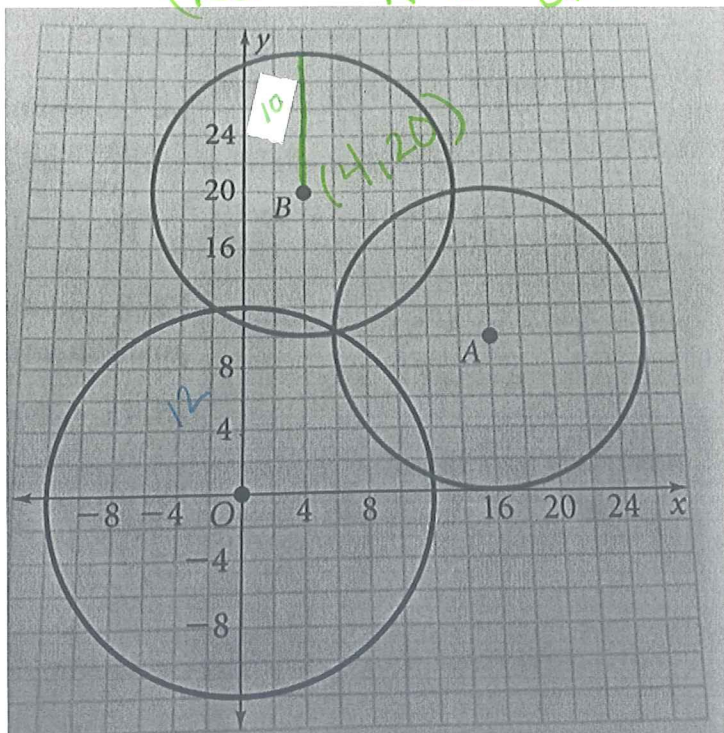
$$(x+7)^2 + (y-5)^2 = 64$$

12. Write the equation of the unit circle.

$$x^2 + y^2 = 1$$

13. Communications: When you make a call on a cellular phone, a tower receives the call. The equation $(x-16)^2 + (y-10)^2 = 100$ models the position and range of tower A. A new tower, tower B, is to be built on the location graphed. Write the equation that describes tower B's position and range. A competing provider builds a different tower, tower O, is to be built on the location graphed. Write the equation that describes tower O's position and range.

(Remember it is units of 2)



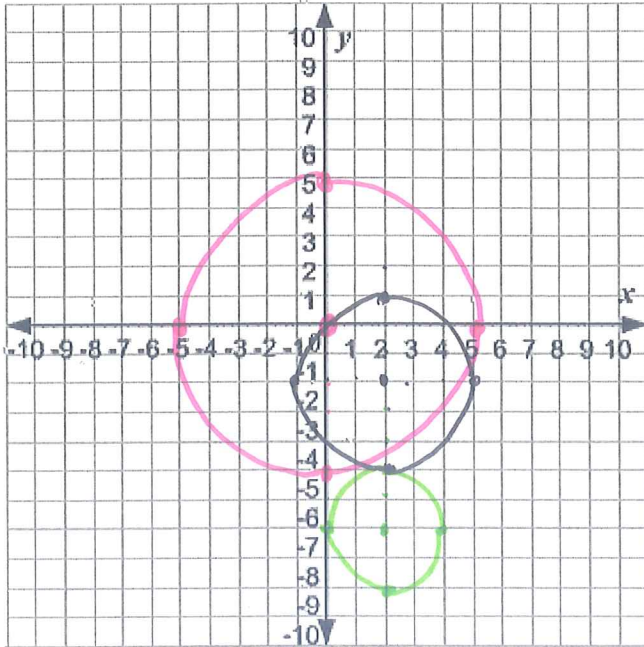
Tower B:

$$(x-4)^2 + (y-20)^2 = 100$$

Tower O:

$$x^2 + y^2 = 144$$

14. a. Graph the circle with the equation $(x - 2)^2 + (y + 2)^2 = 9$.
 b. Graph and write an equation of another circle which is tangent to the one given. *Many Answers... Do NOT use $r=2$*
 c. Graph and write an equation of a third circle which is NOT tangent to the circle given, nor the circle from part a, and has a center at the origin.



b.) $(x - 2)^2 + (y + 7)^2 = 4$

c.) $x^2 + y^2 = 25$

15. The 2 circles $(x + 5)^2 + (y + 5)^2 = 25$ and $(x - 5)^2 + (y - 5)^2 = 25$ are graphed in the standard (x, y) coordinate plane below. Which of the following circles, when graphed, will be tangent to both circles.

- I. $x^2 + y^2 = 4$ ~~X~~
 II. $(x + 5)^2 + (y - 5)^2 = 25$ *yes!!*
 III. $(x + 5)^2 + (y + 5)^2 = 25$

~~NO~~

