

Name: _____
PCH: Circles

Date: _____
Ms. Loughran

Do Now:

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

1. Find the length of the line segment determined by points $A(x, y)$ and $C(h, k)$.

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

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

An equation of the circle with center (h, k) and radius r is

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

Center radius form

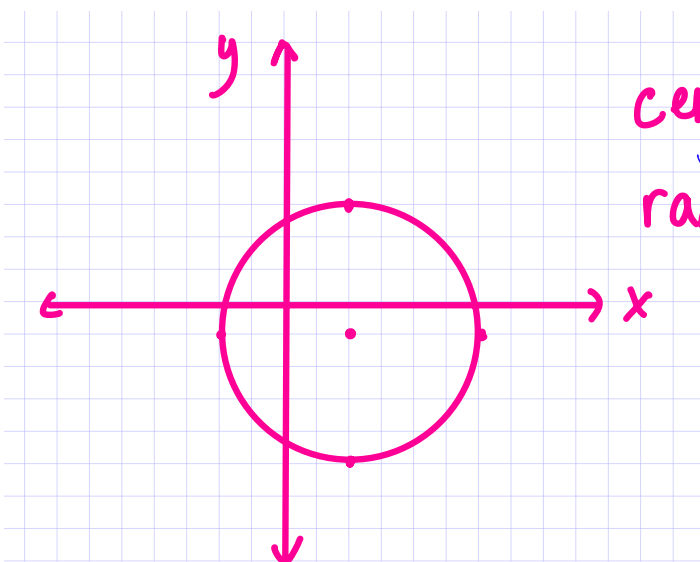
This is called the ~~standard form~~ for the equation of the circle. If the center of the circle is the origin, then the equation is

$$x^2 + y^2 = r^2$$

$$\begin{matrix} (h, k) \\ (0, 0) \end{matrix}$$

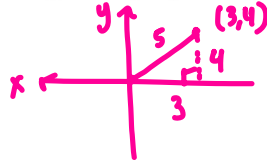
1. Graph each equation.

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



4. Write an equation of the circle whose diameter has endpoints $(0,0)$ and $(6,8)$.

$$\text{midpt: } \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$



$$\text{center: } \left(\frac{0+6}{2}, \frac{0+8}{2} \right)$$

$$\text{center: } (3, 4)$$

$$d = \sqrt{(3-0)^2 + (4-0)^2}$$

$$\begin{aligned} &= \sqrt{9+16} \\ &= \sqrt{25} = 5 \\ &r = 5 \end{aligned}$$

$$(x-3)^2 + (y-4)^2 = 25$$

6. Find the center and radius of the circle $x^2 + y^2 + 4x - 6y - 12 = 0$.

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

$$x^2 + 4x + 4 + y^2 - 6y + 9 = 12 + 4 + 9$$

$$(x+2)^2 + (y-3)^2 = 25$$

$$\text{center: } (-2, 3)$$

$$\text{radius: } 5$$