C.O.: Students will be able to identify distances between points, using them to make the equations of circles.

L.O.: Students will be able to graph circles whose equation was given or discovered by calculating distances between points.

Distance: As a reminder, the distance between two points is the measure of the line segment that connects them.

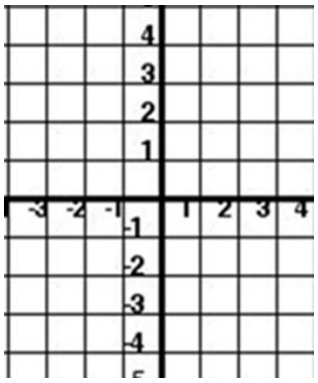
Ex: If $A = x_1$ and $B = x_2$, then the distance (*d*) between points *A* and *B* can be found by $\boldsymbol{d} =$

Ex: Find the distance between the set of points given (label all points and segments connecting each pair of points on the same graph)

1.) *A*: $(-1, 4)$ and B: $(3, 4)$

2.) B: $(3, 4)$ and *C*: $(3, 1)$

3.) *A*: $(-1, 4)$ and *C*: $(3, 1)$



Theorem 13-1: The distance d between points (x_1, y_1) and (x_2, y_2) is given by

- This equation works best if the segment made by the points is a _____ line.
- If the segment between the points is vertical or horizontal, you can find the distance by taking the absolute value of:
  - For vertical: _____
  - For Horizontal: _____

Practice – Distance: Find the distance between the given points

1.) $(-4, 2)$ **and** $(2, 1)$

2.) $(4, 4)$ **and** $(-3, -3)$

Distance and Circles

Circles: Recall that for a circle…

Center: The point in the plane that all points of the circle are equidistant to.

Radius: The line that represents the _____ from any given point on the circle to the center.

Theorem 13-2: An equation of a circle with center (a, b) and radius r is

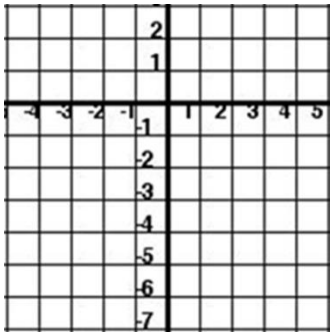
Ex: Write the equation of a circle with the given center and radius

C:$(2, 5)$; $r = 3$

Finding Center and Radius: Find the center and radius of the circle with the given equation. Sketch the graph.

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

Center: **Radius:**



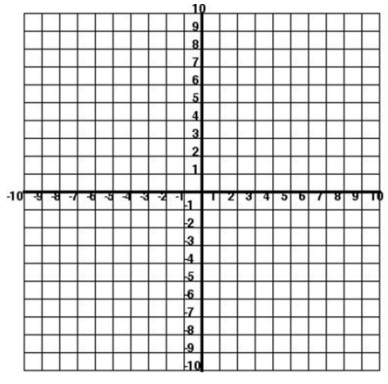
Practice - Circles: Write the equation of a circle with the given information

1.) Center: $(9, -1)$**;Diameter:** 4 **2.) Diameter with endpoints** $(0, 2)$**and**$(8, 8)$

Find the center and radius of the circle with the given equation. Sketch the graph.

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

Center: **Radius:**



4.) $x^2 + (y+5)^2 = 17$

Center: **Radius:**