

Distance Between Two Points

To find the distance between the two points, $(-2, -3)$ and $(4, 5)$, you can use the Pythagorean Theorem.

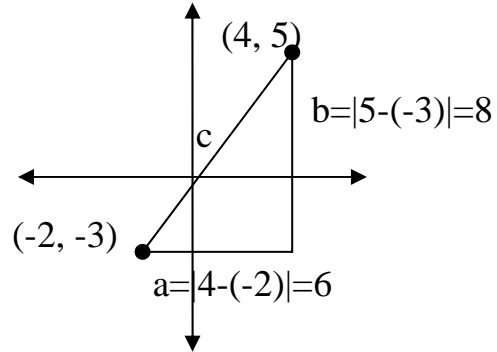
$$a^2 + b^2 = c^2$$

$$(4 - (-2))^2 + (5 - (-3))^2 = c^2$$

$$6^2 + 8^2 = c^2$$

$$c^2 = 100$$

$$c = 10$$

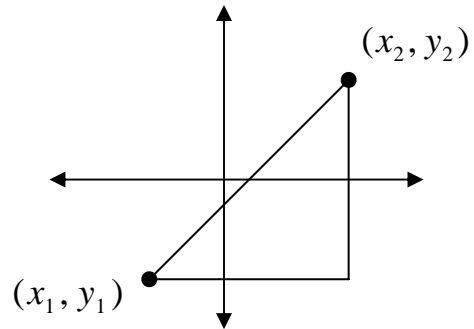


You can use the diagram to generalize the Distance Formula.

Consider the two points (x_1, y_1) , (x_2, y_2) .

Using the Pythagorean Theorem where the distance is the length of the hypotenuse we have:

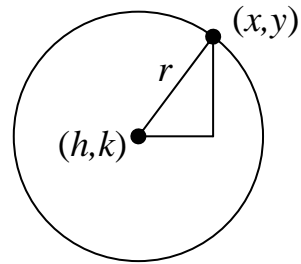
$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$



The Equation of the Circle

A circle is the set of all points in a plane a given distance (radius), r , from a given point (h, k) , called the center.

Again using the Pythagorean Theorem and the Distance Formula you can see that the equation of the circle is.



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

The circle shown has a center at $(3, -1)$ with radius $r=5$. So the equation is.

$$(x - 3)^2 + (y + 1)^2 = 25$$

