What do you remember about the Pythagorean Theorem?

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

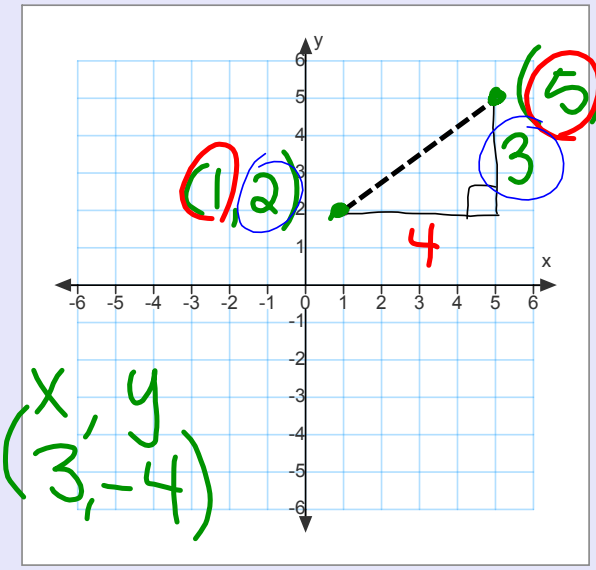
c is the hypotenuse

a & b are the legs

(longest side)

The hypotenuse is across from Right Angle

The Distance Formula!



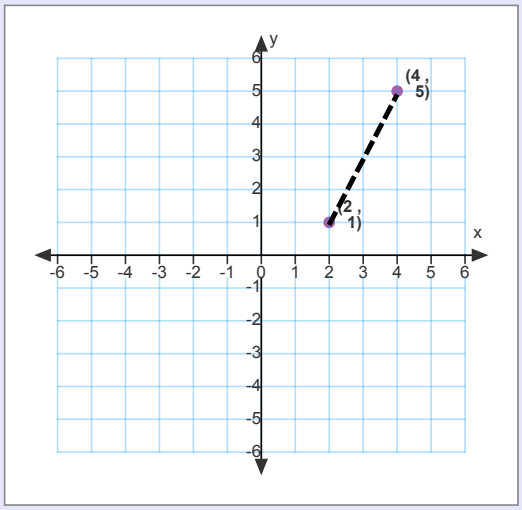
I want to find the distance between the two points on the graph.

Do you see a right triangle?

The distance formula is derived from the Pythagorean Theorem

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

Example:



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

Steps:

1. Write the two points.

① $(2,1)$ ② $(4,5)$

2. Label one point with a 1 and the other point with a 2

3. Put the points into the distance formula.

$$\sqrt{(4-2)^2+(5-1)^2}$$

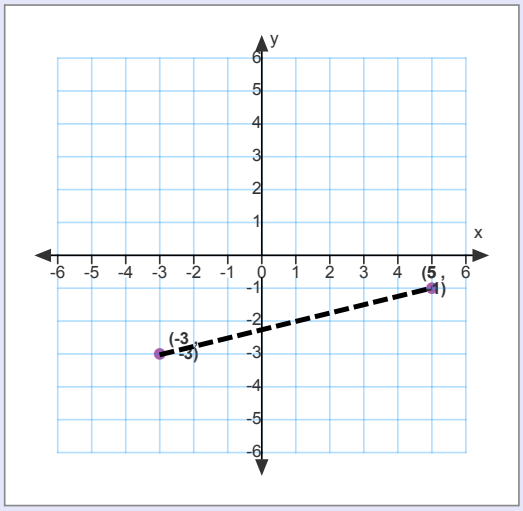
4. Evaluate by subtracting, squaring, adding, and square rooting.

$$\sqrt{2^2+4^2}$$

$$\sqrt{4+16}$$

$$\sqrt{20}=4.5$$

Example:



Make sure you are entering your negatives in the calculator correctly!

$$(X_2-X_1)^2+(y_2-y_1)^2$$

Steps:

1. Write the two points.

① $(-3,-3)$ ② $(5,-1)$

2. Label one point with a 1 and the other point with a 2

3. Put the points into the distance formula.

$$\sqrt{(5-(-3))^2+(-1-(-3))^2}$$

4. Evaluate by subtracting, squaring, adding, and square rooting.

$$\sqrt{8^2+2^2}$$

$$\sqrt{64+4}=\sqrt{68}$$

$$\boxed{8.2}$$

Find the distance between the points (3 , -5) and (-1 , 8).

Steps:

1. Write the two points.

(1) (2)

(x, y)

2. Label one point with a 1 and the other point with a 2

3. Put the points into the distance formula.

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

$$\sqrt{(-1-3)^2+(8--5)^2}$$

4. Evaluate by subtracting, squaring, adding, and square rooting.

$$\sqrt{(-4)^2+(13)^2}$$

$$\sqrt{16+169}$$

$$\sqrt{185} = 13.6$$

(x_1, y_1) (x_2, y_2)

Complete the Worksheet Problems 1-12!