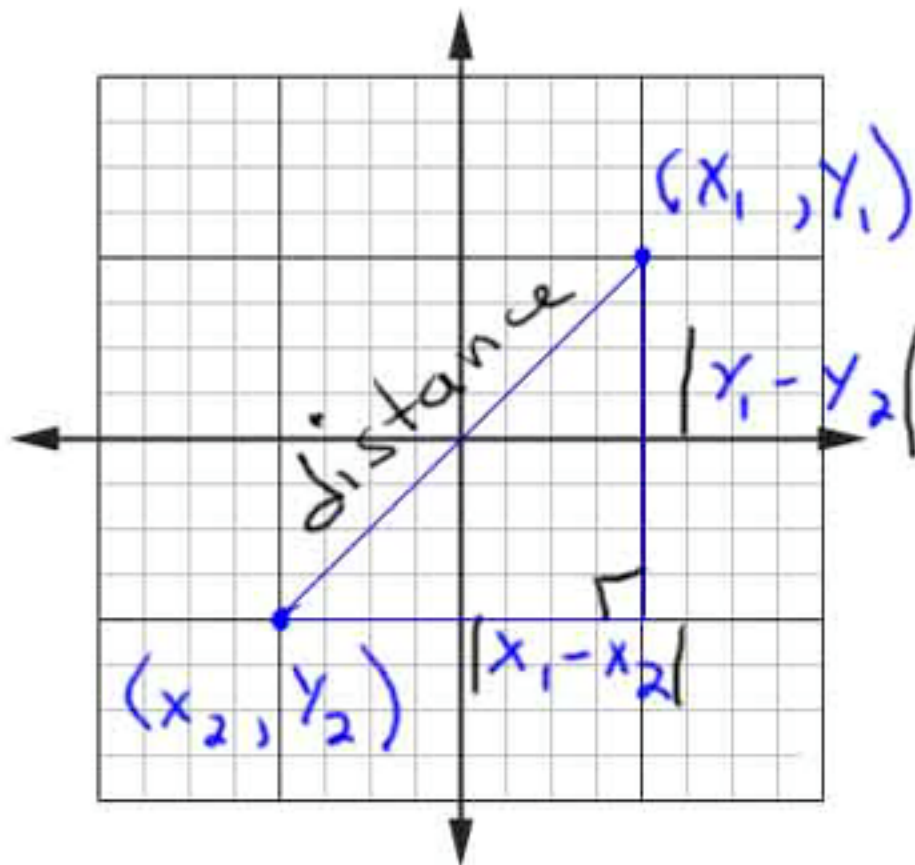
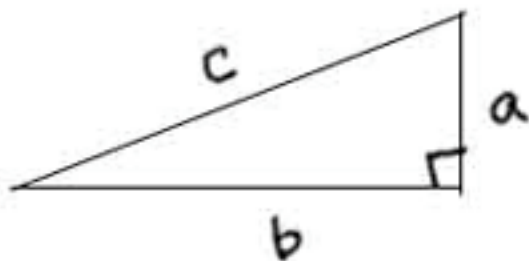


Recall the Pythagorean Theorem: If the length of the hypotenuse of a right triangle is "c", and the lengths of the other two sides are "a" and "b" then  $c^2 = a^2 + b^2$ .



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

$$c = \sqrt{a^2 + b^2}$$

$$\text{distance} = \sqrt{a^2 + b^2}$$

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

Ex 1) Find the distance between the points (8, 7) and (3, -5).

$$d = \sqrt{(8-3)^2 + (7-(-5))^2}$$

$$d = \sqrt{5^2 + 12^2}$$

$$d = \sqrt{25 + 144}$$

$$d = \sqrt{169}$$

$$d = 13$$

Midpoint Formula

If the coordinates of the endpoints of a line segment are

$(x_1, y_1)$  and  $(x_2, y_2)$

then the coordinates of the midpoint are:

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

Ex 2) Find the coordinates of the midpoint of the line segment with endpoints  $(-3, 5)$  and  $(4, -7)$ .

$$\left( \frac{-3+4}{2}, \frac{5+(-7)}{2} \right)$$

$$\left( \frac{1}{2}, \frac{-2}{2} \right)$$

$$\left( \frac{1}{2}, -1 \right)$$