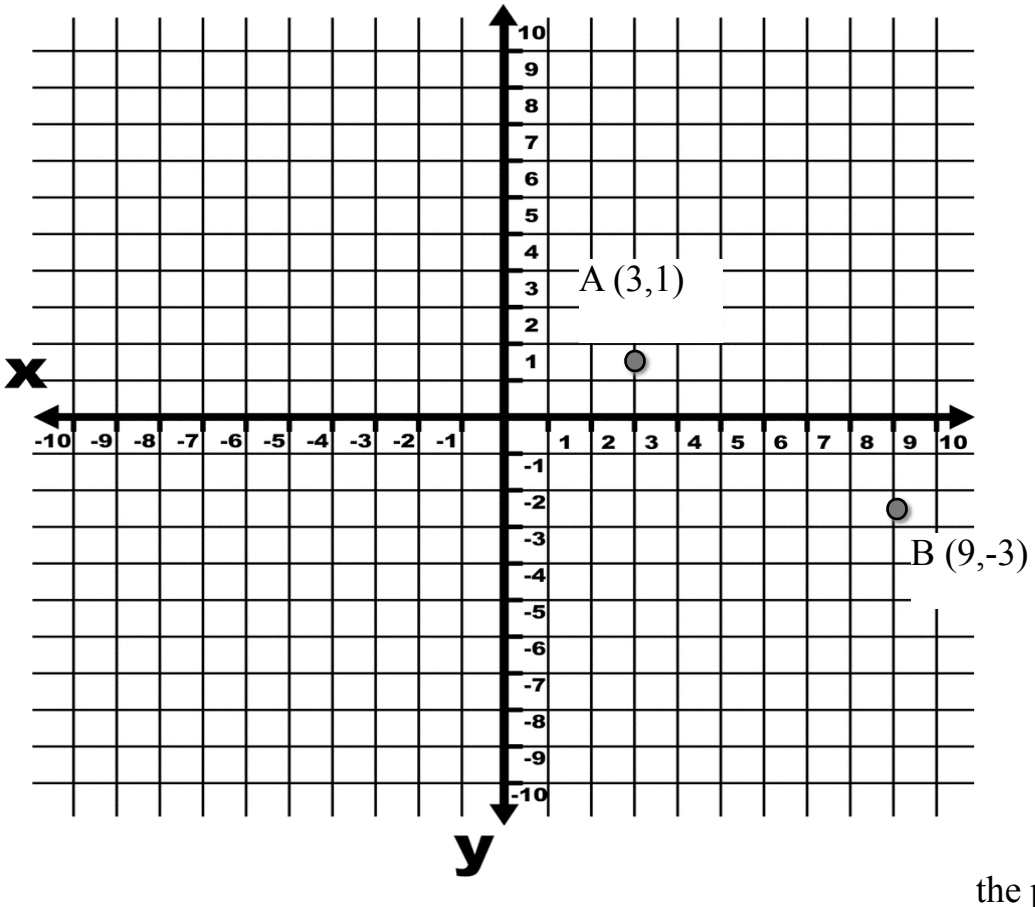
Midpoint

Given two points on the Cartesian plane, we want to know the coordinates of the point that is exactly halfway between them (midpoint)

we are cutting the line in half

Example #1:

Point A is located at (3,1) Point B is located at (9,-3)



Label the points as (x_1, y_1) and (x_2, y_2)

The formula that gives the coordinates of the midpoint is:

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

So, we calculate:

$$\left(\frac{9+3}{2}, \frac{-3+1}{2} \right)$$

$$\left(\frac{12}{2}, \frac{-2}{2} \right)$$

(6 , -1) $\Longrightarrow$ This would be the coordinates of our midpoint

Example #2:

Point A is located at (3,5) Point B is located at (1, 4)

Step # 1 – Label the points

A (3, 5) B (1, 4)
(x_1, y_1) (x_2, y_2)

Step #2 – Write the formula

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

Step #3 – Fill in the formula and calculate

$$\left(\frac{1+3}{2}, \frac{4+5}{2} \right) \Longrightarrow \left(\frac{4}{2}, \frac{9}{2} \right)$$

Midpoint is located at (2 , 4.5)