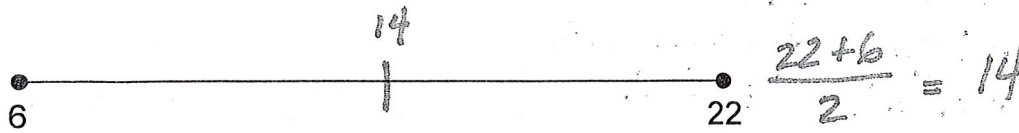


$$\text{MIDPOINT FORMULA} = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

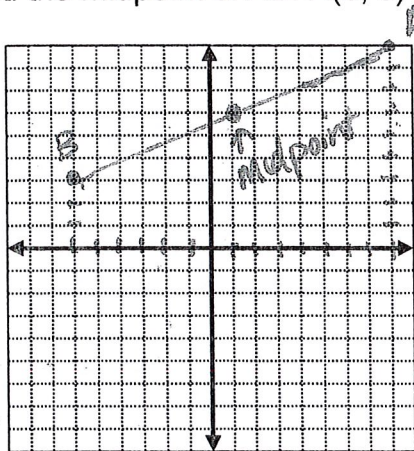
Add the x-values, divide by 2. Add the y-values, divide by 2.

Midpoint: The point that divides a segment into two congruent segments

Example 1: Find the midpoint of the following segment.



Example 2: Find the midpoint of \overline{AB} . A(8, 9) and B(-6, 3).



$$\left(\frac{8 + -6}{2}, \frac{9 + 3}{2} \right)$$

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

$$(1, 6)$$

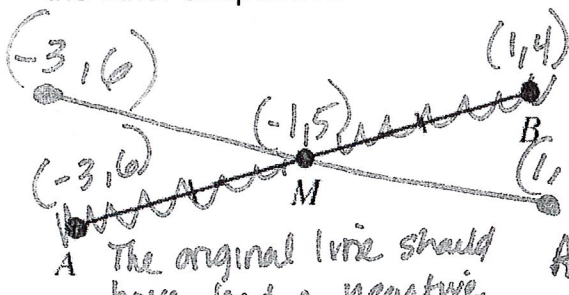
Example 3) Find the coordinates of midpoint of A(-2, 6) and B(8, -4)

$$\text{midpoint Formula} \left(\frac{y_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right) = \left(\frac{-2 + 8}{2}, \frac{6 + -4}{2} \right) = \left(\frac{6}{2}, \frac{2}{2} \right) \Rightarrow (3, 1)$$

Example 4) Find the coordinates of midpoint of J(-5, -1) and K(-6, 9)

$$\text{midpoint Formula} = \left(\frac{-5 + -6}{2}, \frac{-1 + 9}{2} \right) \Rightarrow \left(\frac{-11}{2}, \frac{8}{2} \right) \Rightarrow (-5.5, 4)$$

Challenge Example) The midpoint of \overline{AB} is M (-1, 5) one endpoint is B (1, 4). Find the coordinates of the other endpoint A.



Consider the difference from the midpoint to the given X coordinate
 -1 to 1 is 2 away \therefore 2 left of -1 is -3
 The distance from the midpoint to the y coordinate is 5 to 4 is 1 away \therefore the y value is 6

A The original line should have had a negative slope

A (-3, 6)