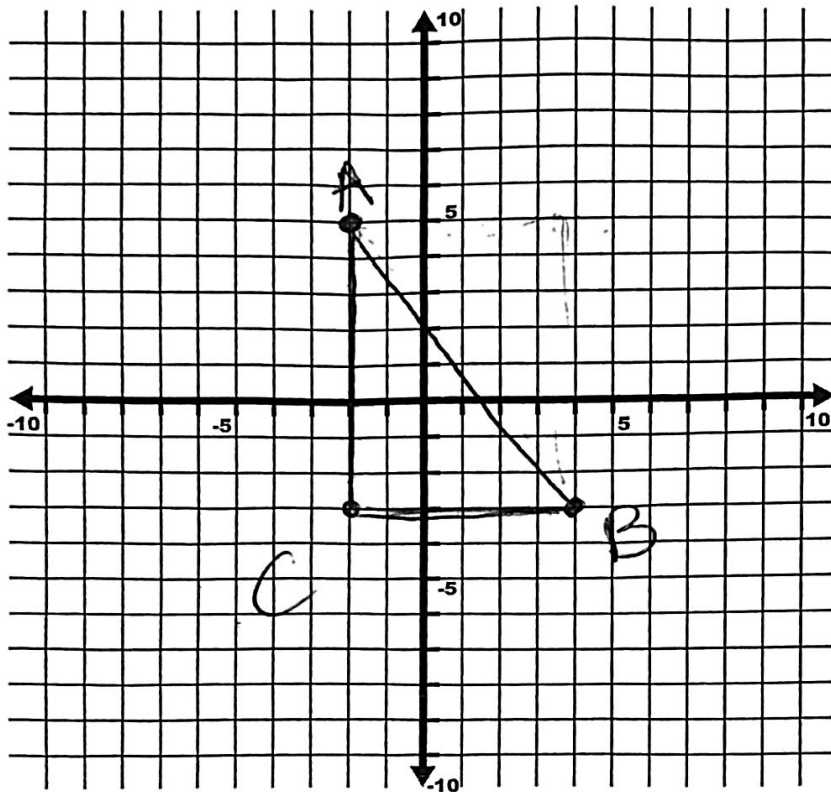


Coordinate Geometry

Graph: A(-2,5) B(4,-3) and C(-2,-3)

What is the distance between points A and B



Pythag Theorem
 $a^2 + b^2 = c^2$
 ~~$6^2 + 8^2 = c^2$~~
 $6^2 + 8^2 = c^2$
 $36 + 64 = 100 = c^2$
 $\sqrt{100} = \sqrt{c^2}$
 $10 = c$

C and B?

6 units

A and C?

8 units

Midpoint Formula

The midpoint theorem states that for any point $A(x_1, y_1)$ and $B(x_2, y_2)$ the midpoint of segment AB has coordinates of

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

$A(x_1, y_1)$
 $A(7, -3)$

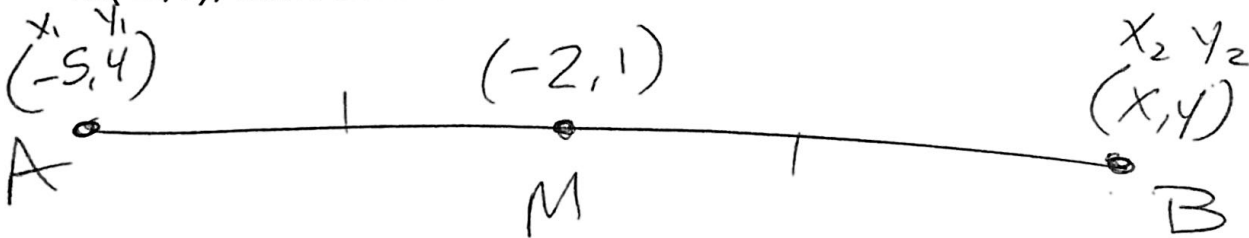
$C(x_2, y_2)$
 $C(4, 8)$

$$\left(\frac{7+4}{2}, \frac{-3+8}{2} \right)$$

$$\frac{11}{2}, \frac{5}{2}$$

$$(5.5, 2.5)$$

If $A(-5, 4)$ and $B(x, y)$ are endpoints of segment AB with midpoint $M(-2, 1)$, then what are the coordinates of B?



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

$$\left(\frac{-5 + x}{2}, \frac{4 + y}{2} \right)$$

$$\begin{array}{cc} \downarrow & \downarrow \\ -2 & 1 \end{array}$$

$$2 \cdot \frac{-5 + x}{2} = -2 \cdot 2$$

$$\begin{array}{r} -5 + x = -4 \\ +5 \quad +5 \\ \hline x = 1 \end{array}$$

$$2 \cdot \frac{4 + y}{2} = 1 \cdot 2$$

$$\begin{array}{r} 4 + y = 2 \\ -4 \quad -4 \\ \hline y = -2 \end{array}$$

$$(1, -2)$$