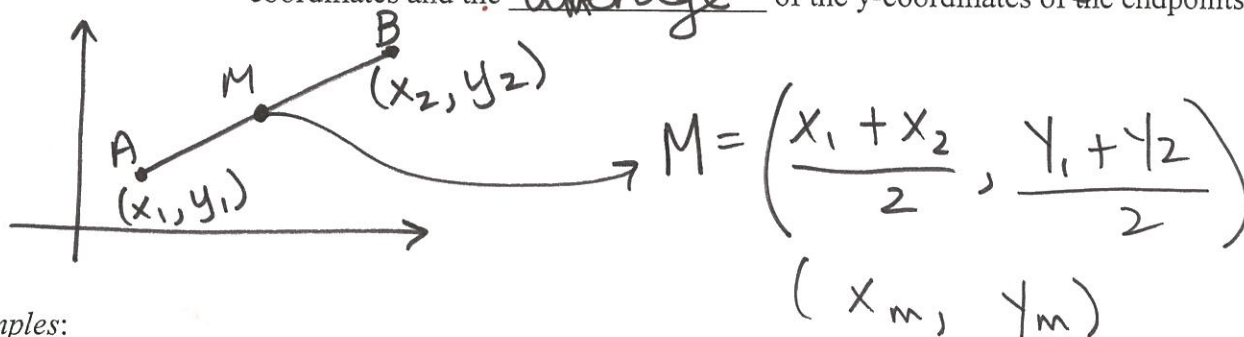


Using the Midpoint Formula

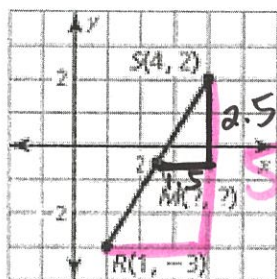
Lesson Objective: INBAT And locations of midpoints in the coordinate plane.

The Midpoint Formula: The coordinates of the midpoint of a segment are the average of the x-coordinates and the average of the y-coordinates of the endpoints.



Examples:

- The endpoints of $\overline{RS}$ are shown in the diagram. Find the coordinates of the midpoint M.



Method #1: Δs

$$M(4 - 1.5, 2 - 2.5)$$

$$M(2.5, -0.5)$$

+ explain

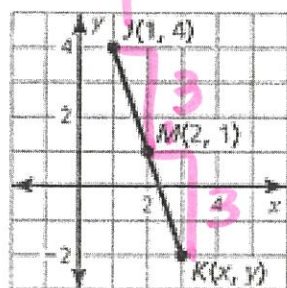
Method #2: formula

$$M\left(\frac{1+4}{2}, \frac{-3+2}{2}\right)$$

$$M\left(\frac{5}{2}, -\frac{1}{2}\right)$$

$$M(2.5, -0.5)$$

- The midpoint of $\overline{JK}$ and endpoint J are given. Find the coordinates of the other endpoint, K.



$$K(2 + 1, 1 - 3)$$

$$K(3, -2)$$

+ explain

$$x_m = \frac{x_1 + x_2}{2}$$

$$y_m = \frac{y_1 + y_2}{2}$$

$$2 \cdot 2 = \left(\frac{1 + x_2}{2}\right) \cdot 2$$

$$1 = \frac{4 + y_2}{2}$$

$$4 = 1 + x$$

$$2 = 4 + y$$

$$3 = x$$

$$-2 = y$$

$$K(3, -2)$$