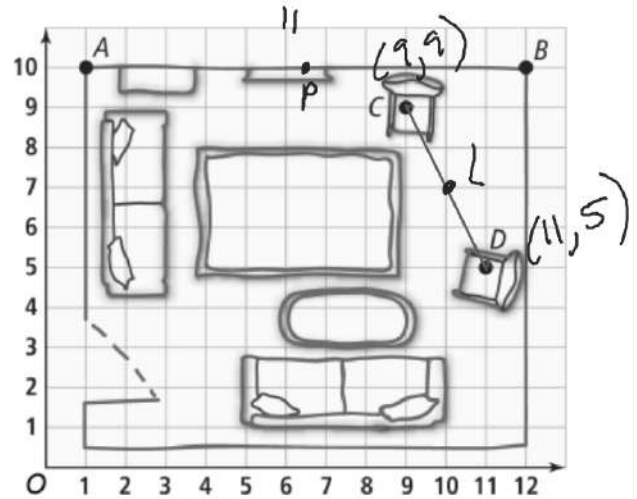


LaTanya is decorating her living room and draws a floorplan to help look at placement.

A. LaTanya wants to hang a picture at the center of the back wall. How do you find the point at the center between A and B?

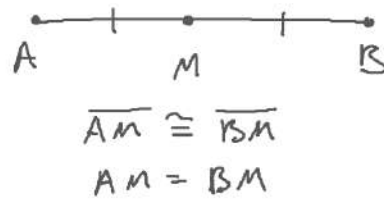
Enter your answer.

B. Communicate Precisely LaTanya wants to place a lamp halfway between the chairs at points C and D. How can you find the point where the lamp should go?



$$\left(\frac{11+9}{2}, \frac{5+9}{2} \right)$$
$$(10, 7)$$

A midpoint of a segment is the point that divides the segment into two congruent segments.

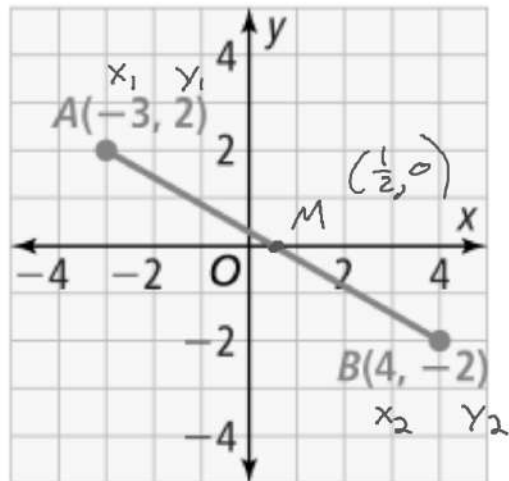


The midpoint of \overline{PQ} with $P(x_1, y_1)$ and $Q(x_2, y_2)$ is:

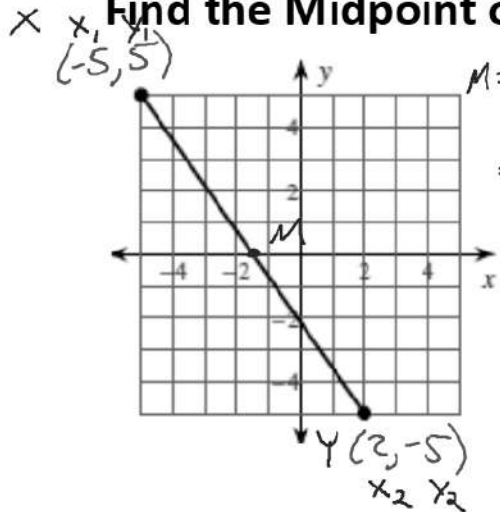
$$M = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right) = (x, y)$$

What is the midpoint of \overline{AB} ?

$$\begin{aligned} M &= \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right) \\ &= \left(\frac{-3 + 4}{2}, \frac{2 + (-2)}{2} \right) \\ &= \left(\frac{1}{2}, 0 \right) \end{aligned}$$



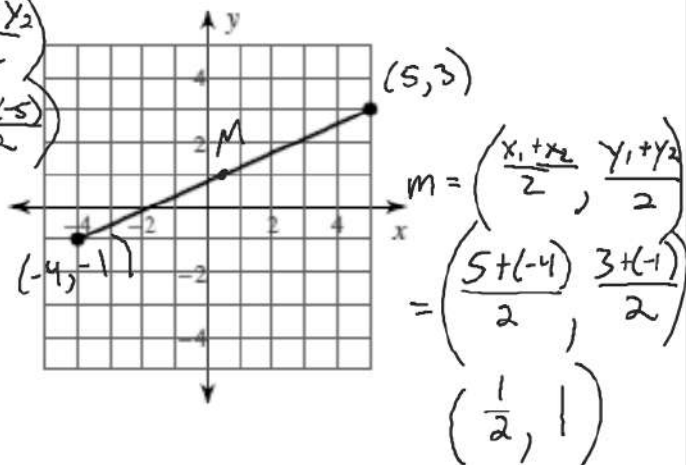
Find the Midpoint of each segment.



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

$$= \left(\frac{-5 + 2}{2}, \frac{5 + (-5)}{2} \right)$$

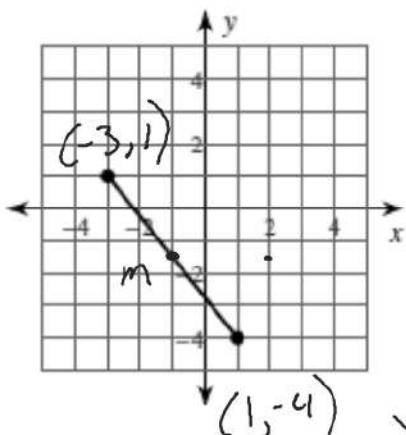
$$\left(-\frac{3}{2}, 0 \right)$$



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

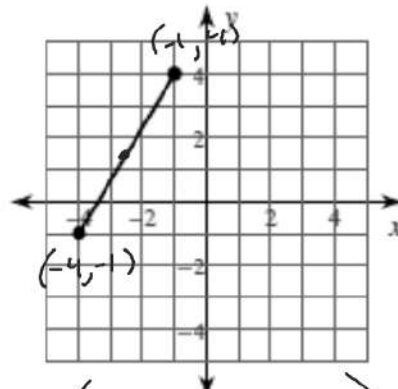
$$= \left(\frac{5 + (-4)}{2}, \frac{3 + (-1)}{2} \right)$$

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



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

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



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

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

. Find the midpoint for each segment with the given endpoints.

. $C(-2, 5)$ and $D(8, -12)$.

$$M = \left(\frac{-2+8}{2}, \frac{5+(-12)}{2} \right)$$
$$\left(3, -\frac{7}{2} \right)$$

Find the midpoint of the line segment with the given endpoints.

9) $(-4, 4), (5, -1)$

$$m = \left(\frac{-4+5}{2}, \frac{4+(-1)}{2} \right)$$
$$\left(\frac{1}{2}, \frac{3}{2} \right)$$

10) $(-1, -6), (-6, 5)$

$$m = \left(\frac{-1+(-6)}{2}, \frac{-6+5}{2} \right)$$
$$\left(\frac{-7}{2}, \frac{-1}{2} \right)$$

13) $(5, 2), (-4, -3)$

$$m = \left(\frac{5+(-4)}{2}, \frac{2+(-3)}{2} \right)$$
$$\left(\frac{1}{2}, -\frac{1}{2} \right)$$

14) $(-1, 1), (5, -5)$

$$m = \left(\frac{-1+5}{2}, \frac{1+(-5)}{2} \right)$$
$$(2, -2)$$

Find the other endpoint of the line segment with the given endpoint and midpoint.

A
Endpoint: $(-1, 9)$, midpoint: $(-9, -10)$
 x_1, y_1 m_x, m_y (x_2, y_2)

Endpoint: $(2, 5)$, midpoint: $(5, 1)$
 x_1, y_1

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

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

Find
 (x_2, y_2)

$$\frac{x_1 + x_2}{2} = -9$$

$$\frac{y_1 + y_2}{2} = -10$$

$$\frac{x_1 + x_2}{2} = 5$$

$$\frac{y_1 + y_2}{2} = 1$$

$$\left(\frac{-1 + x_2}{2} \right)^2 = (-9)^2$$

$$\left(\frac{9 + y_2}{2} \right)^2 = (-10)^2$$

$$\left(\frac{2 + x_2}{2} \right)^2 = (5)^2$$

$$\left(\frac{5 + y_2}{2} \right)^2 = (1)^2$$

$$\begin{array}{r} -1 + x_2 = -18 \\ +1 \end{array}$$

$$9 + y_2 = -20$$

$$2 + x_2 = 10$$

$$5 + y_2 = 2$$

$$x_2 = -17$$

$$y_2 = -29$$

$$x_2 = 8$$

$$y_2 = -3$$

$$(-17, -29)$$

$$(8, -3)$$

Find the other endpoint of the line segment with the given endpoint and midpoint.

Endpoint: $(-9, 7)$, midpoint: $(10, -3)$

26) Endpoint: $(-6, 4)$, midpoint: $(4, 8)$

$$(29, -13)$$

$$\left(\frac{7+y_2}{2}\right)^2 = (-3)^2$$

$$\begin{array}{r} 7+y_2 = -6 \\ -7 \quad \quad -7 \end{array}$$