

Warm-Up



1. Put your phones away.
2. Take out your 2 HWs and 2 Calendars to be checked.

What am I learning today?

Learning Objective 5.2

How to calculate the midpoint of a line segment

Midpoint - The point **HALFWAY** between two points.

1st point (x_1, y_1)
(Endpoint)

2nd point (x_2, y_2)
(Endpoint)

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

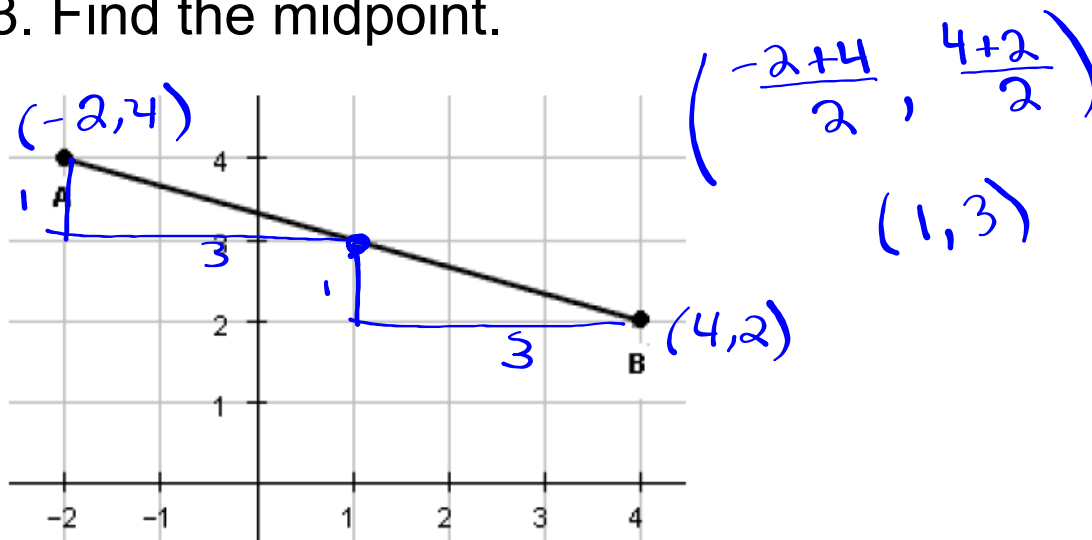
1. Find the midpoint between $(0, 4)$ and $(-6, 2)$

$$\left(\frac{0 + (-6)}{2}, \frac{4 + 2}{2} \right)$$
$$(-3, 3)$$

2. Find the midpoint between $(-3, -5)$ and $(-2, -8)$

$$\left(\frac{-3 + (-2)}{2}, \frac{-5 + (-8)}{2} \right)$$
$$\left(-\frac{5}{2}, -\frac{13}{2} \right) \rightarrow (-2.5, -6.5)$$

3. Find the midpoint.



4. Find the other endpoint of the segment AB if A(3,5) and the midpoint is (8,0).

$$\frac{3+x}{2} = \frac{8}{1} \qquad \frac{5+y}{2} = \frac{0}{1} \qquad B(13, -5)$$

$$-16 = -3 + x \qquad -5 = -5 + y$$

$$13 = x \qquad -5 = y$$

5. If one endpoint is (-8,3) and the midpoint is (0,3), what is the other endpoint?

$$\frac{-8+x}{2} = \frac{0}{1} \qquad \frac{3+y}{2} = \frac{3}{1} \qquad (8, 3)$$

$$-8+x=0 \qquad 3+y=6$$

$$+8 \qquad -3$$

$$x=8 \qquad y=3$$

6. Endpoint: D(-3,-5) and Midpoint: M(-3/2,6). Where is the other endpoint?

$$\frac{-3+x}{2} = \frac{-3}{2} \qquad \frac{-5+y}{2} = \frac{6}{1} \qquad (0, 17)$$

$$-6 = -6 + 2x \qquad 12 = -5 + y$$

$$+6 \qquad +5$$

$$\frac{0}{2} = \frac{2x}{2} \qquad 17 = y$$

$$0 = x$$

Learning Objective 5.3

How to partition a line segment

Partitioning - Calculating a point somewhere in between two points that **CUTS** a line segment into a proportion.

1st point (x_1, y_1)
(**Endpoint**)

2nd point (x_2, y_2)
(**Endpoint**)

FORMULA:

$$\left(x_1 + \frac{a}{a+b} (x_2 - x_1), y_1 + \frac{a}{a+b} (y_2 - y_1) \right)$$

↑
ratio a:b
OR
fraction

1. Given the points A(3,4) and B(8,10), find the coordinate of P on the segment AB that partitions AB in the ratio 1:2.

$$\frac{a}{a+b} \rightarrow \frac{1}{3}$$

$$\left(3 + \frac{1}{3}(8-3), 4 + \frac{1}{3}(10-4) \right)$$

$$\left(\frac{14}{3}, 6 \right) \rightarrow (4.67, 6)$$

2. Given the points A(3,4) and B(8,10), find the coordinate of point P on the segment BA that partitions BA in the ratio 1:2.

$$\left(8 + \frac{1}{3}(3-8), 10 + \frac{1}{3}(4-10) \right)$$

$$\left(\frac{19}{3}, 8 \right) \rightarrow (6.3, 8)$$

3. Given the points A(-3,5) and B(-8,7), find the coordinate of point P on the segment AB so that P is 4/5 away from A. 1st

$$\left(-3 + \frac{4}{5}(-8 - (-3)), 5 + \frac{4}{5}(7 - 5) \right)$$

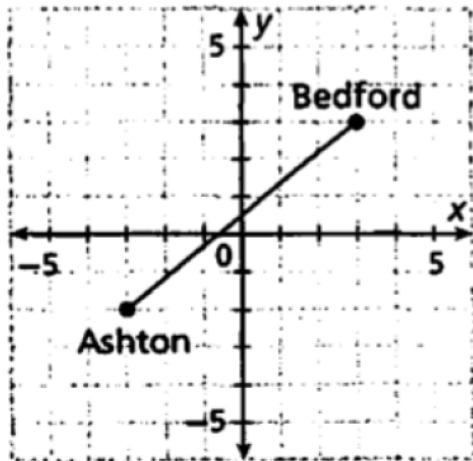
$$\left(-7, \frac{33}{5} \right) \rightarrow (-7, 6.6)$$

4. Given the line segment BA with A(-1,0) and B(-2,4), partition the line segment using 1/3

$$\left(-2 + \frac{1}{3}(-1 - (-2)), 4 + \frac{1}{3}(0 - 4) \right)$$

$$\left(-\frac{5}{3}, \frac{8}{3} \right) \rightarrow (-1.67, 2.67)$$

5. The map shows a straight highway between two towns. A highway planner wants to put **TWO** new rest stops between the towns so that it divides the highway into 3 equal parts. Find the coordinates of the rest stops.



Classwork:



Complete the classwork about midpoint, partitioning, and review over linear equations (parallel and perpendicular)

HW: Finish your classwork