

**Unit 4.5 Day 13: Midpoint**

Midpoint Investigation

middle point between 2 points

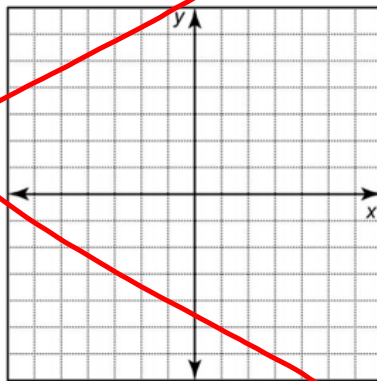
- Using the grid provided, plot the line segments defined by each pair of endpoints. Label the endpoints with their coordinates.  
a)  $A(-4,2)$  and  $B(6,2)$       b)  $C(-3,0)$  and  $D(2,0)$

2. What do these two line segments have in common?

3. Determine the coordinates of the midpoint of each segment. Label each midpoint with its coordinates.

Mipoint of AB \_\_\_\_\_

Mipoint of CD \_\_\_\_\_

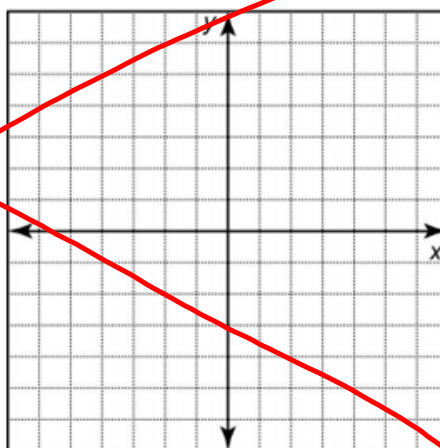


4. Using the grid provided, plot the line segments defined by each pair of endpoints. Label the endpoints with their coordinates.

- a)  $G(-4,2)$  and  $H(-4,6)$     b)  $J(-1,7)$  and  $K(-1,-2)$

5. What do these two line segments have in common?

6. Determine the coordinates of the midpoint of each segment. Label each midpoint with its coordinates.



Mipoint of GH \_\_\_\_\_

Mipoint of JK \_\_\_\_\_

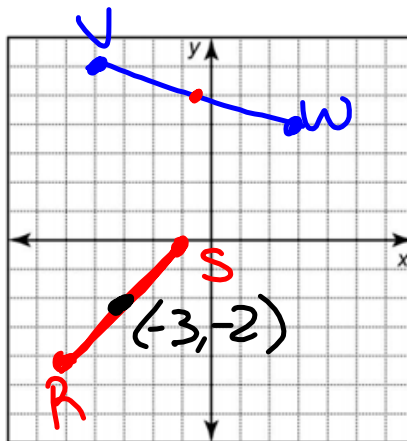
7. Using the grid provided, plot the line segments defined by each pair of endpoints. Label the endpoints with their coordinates.

- a)  ~~$P(-5, -4)$~~  and  ~~$Q(-1, 0)$~~     b)  ~~$U(-2, 5)$~~  and  ~~$V(3, 4)$~~

$y: \frac{6+4}{2}$      $x: \frac{-4+3}{2} = -\frac{1}{2}$   
 $x: -0.5$

8. Determine the coordinates of the midpoint of each segment. Label each midpoint with its coordinates.

Mipoint of RS  $(-3, -2)$   
 Mipoint of VW  $(-0.5, 5)$



9. Describe how you calculated the coordinates of the midpoints for RS and VW:

take average of x-values & average of y-values

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

**Practice: Use the graphs if necessary**

1.) Find the midpoint of the segment connecting the points (6,4) and (3,-4)

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

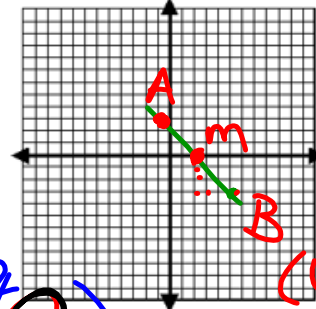
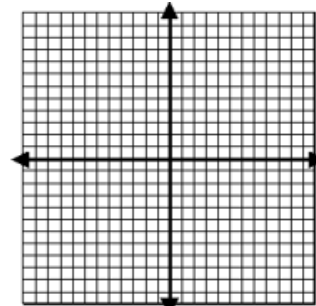
$m = (4.5, 0)$

2.) Find the midpoint of the segment connecting the points (a,b) and (3a,c).

$m = \left( \frac{a+3a}{2}, \frac{b+c}{2} \right)$

$m = \left( 2a, \frac{b+c}{2} \right)$

3.) M is the midpoint of AB. The coordinates of A are (-2,3) and the coordinates of M are (1,0). Find the coordinates of B.



X-values

Y-values

$1 = \frac{-2 + x_2}{2}$

$2 = -2 + x_2$

$4 = x_2$

$0 = \frac{3 + y_2}{2}$

$0 = 3 + y_2$

$-3 = y_2$

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

5.) Endpoint:  $(-1, 9)$ , midpoint:  $(-9, -10)$

6.) Endpoint:  $(2, 5)$ , midpoint:  $(4, 1)$

y value

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

x value

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

$$5 + y_2 = 2$$

$$-5 + y_2 = -2$$

$$2 + x_2 = 10$$

$$x_2 = 8$$

$(8, -3)$

$y_2 = -3$