

I will be able to calculate the midpoint of a line segment.

Checking In

Minds on Find the middle

Action! 2.1 Midpoint of a Line Segment

Consolidation White Board Challenge

New Unit

Analytic Geometry

Adding and Subtracting Fractions

$$\begin{aligned} & \frac{4}{4} \times \frac{1}{3} + \frac{5}{12} \\ &= \frac{4}{12} + \frac{5}{12} \\ &= \frac{9}{12} = \frac{3}{4} \end{aligned}$$

$$\begin{aligned} & \frac{3}{3} \times \frac{4}{5} - \frac{1}{3} \times \frac{5}{5} \\ &= \frac{12}{15} - \frac{5}{15} \\ &= \frac{7}{15} \end{aligned}$$

$$\frac{3}{3} \times \frac{3}{4} + \frac{2}{3} \times \frac{4}{4}$$

$$= \frac{9}{12} + \frac{8}{12}$$

$$= \frac{17}{12}$$

Multiplying Fractions

$$\frac{3}{4} \times \frac{2}{5} = \frac{6}{20} = \frac{3}{10}$$

Dividing Fractions

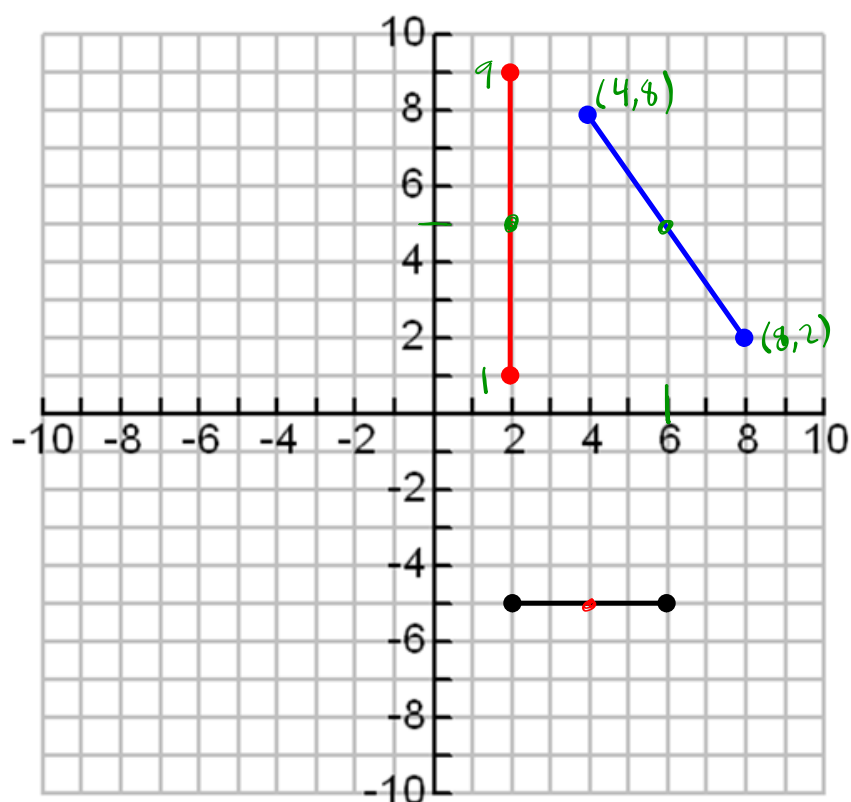
$$\frac{2}{11} \div \frac{3}{5}$$

$$= \frac{2}{11} \times \frac{5}{3}$$

$$= \frac{10}{33}$$

Minds on

Find the middle of each line...



1

2

3

What is a line segment?

What is a midpoint?

 **Minds on**

Can you find the midpoint from a set of points?

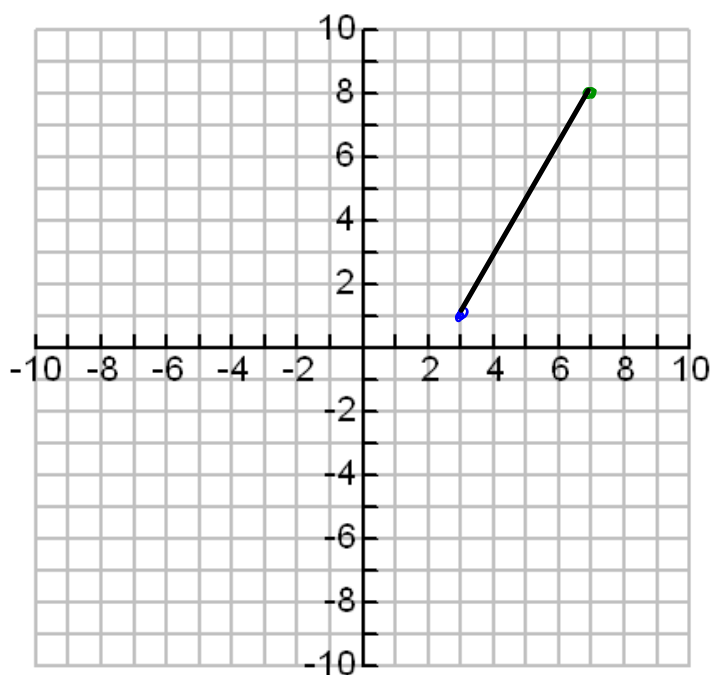
$(4, 3)$ and $(4, 7)$?

$(2, 3)$ and $(6, 11)$?

What strategies are you using?

Section 2.1: Midpoint of a Line Segment

Determine the midpoint (M) of the line segment with endpoints $A(3, 1)$ and $B(7, 8)$.



$$\text{midpoint} = (5, 4.5)$$

Midpoint of a Line Segment:

To determine the Midpoint (M) of a line segment with endpoints $A(x_1, y_1)$ & $B(x_2, y_2)$ we use the following formula;

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

Ex1: Determine the midpoint (M) of the line segment with endpoints A(3,1) and C(9,9).

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

$$= \left(\frac{3 + 9}{2}, \frac{1 + 9}{2} \right)$$

$$= (6, 5)$$

Ex2: Determine the midpoint (M) of the line segment with the endpoints P(-3, 2) and R(5, -7)

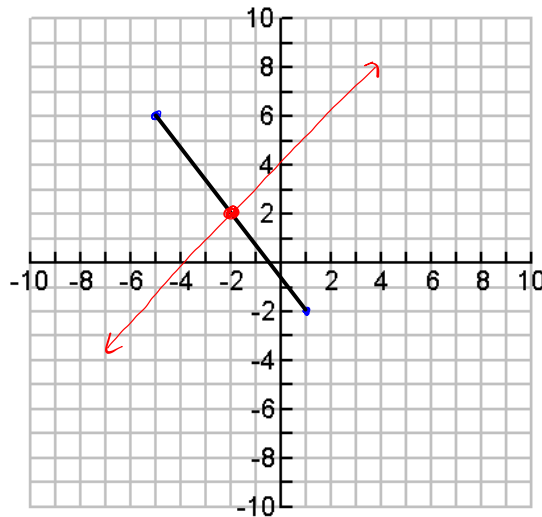
$$\begin{aligned} M &= \left(\frac{-3+5}{2}, \frac{2-7}{2} \right) \\ &= \left(\frac{2}{2}, -\frac{5}{2} \right) \\ &= (1, -2.5) \end{aligned}$$

2.1 Midpoint of a Line

September 27, 2017

Ex3: Determine the equation of the perpendicular bisector of a line segment with endpoints A (-5, 6) and B (1, -2)

crosses the line at the midpoint, and is perpendicular.



Find M

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

$$M = \left(\frac{-4}{2}, \frac{4}{2} \right)$$

$$M = (-2, 2)$$

Slope given line

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-2 - 6}{1 - (-5)} = \frac{-8}{6} = \left(-\frac{4}{3} \right)$$

$$\perp \text{ slope} = \left(\frac{3}{4} \right)$$

y-intercept

$$y = mx + b$$

$$* b = y - mx$$

$$b = 2 - \left(\frac{3}{4} \right) \left(\frac{-2}{1} \right)$$

$$b = 2 - \left(\frac{-6}{4} \right)$$

$$b = \frac{4}{4} + \frac{6}{4}$$

$$b = \frac{8}{4} + \frac{6}{4}$$

$$b = \frac{14}{4}$$

$$\therefore y = \frac{3}{4}x + \frac{7}{2}$$

Determine the equation of the perpendicular bisector of the line segment with endpoints $(-2, 5)$ and $(4, 3)$.

- 1. Find Midpoint**
- 2. Find slope of line segment.**
- 3. Find slope of perpendicular line.**
- 4. Find y-intercept of perpendicular line.**
 - be sure to use midpoint here!**

White Board Challenge!

Determine the midpoint of the line segment with endpoints:

$(1, 3)$ and $(2, 9)$

$(-4, 13)$ and $(-1, -5)$

$(0, -8)$ and $(-10, 2)$

Consolidation

Practice: pg. 79-80: # 4)bde, 6), 9) 13)ad, 14)