

Name: _____

Period: _____

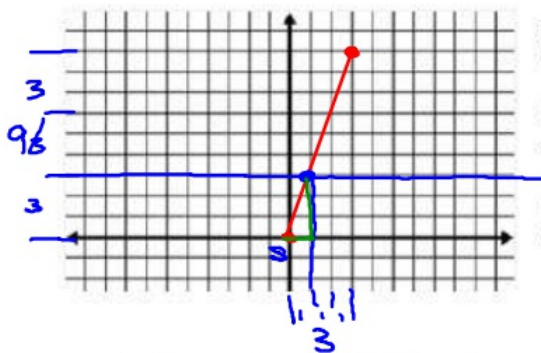
NS & L Day 5 IN CLASS

Secondary 2 Honors

Harry Potter and the Need for Speed!

Back to our Hogwarts friends! In each of the following questions, please make sure to label which coordinate is the start and which coordinate is the finish.

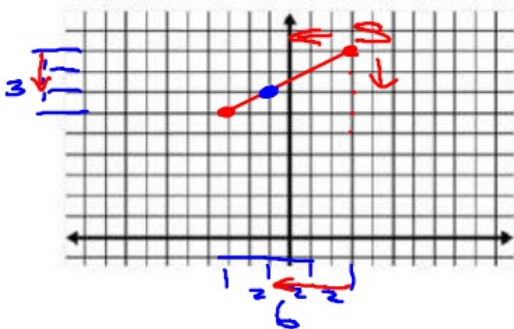
1. Harry and Draco are starting a race from $(0,0)$ to $(3,9)$. Professor McGonagall realized what was going on, got on her broom stick and stopped Harry on his path then dove straight down and used a magical spell to make Draco come to her, they were both exactly $\frac{1}{3}$ of the way through the race.



- On the graph to the left draw Harry's path and Draco's path as if they had finished the entire race.
- In a different color, draw Harry's path and Draco's path that they actually travelled.
- Find McGonagall's coordinates, mark it on the graph, and describe your process.

$(1, 3)$

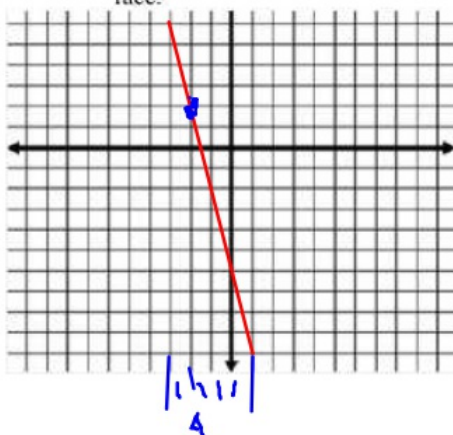
2. Harry and Draco couldn't handle not settling their score. Now they race from $(3,9)$ to $(-3,6)$. They almost finished this time, but Professor McGonagall stopped them exactly $\frac{2}{3}$ of the way through the race.



- On the graph to the left draw Harry's path and Draco's path as if they had finished the entire race.
- In a different color, draw Harry's path and Draco's path that they actually travelled.
- Find McGonagall's coordinates, mark it on the graph, and describe your process.

$(-1, 7)$

3. Harry and Draco race from $(-3,6)$ to $(1,-10)$. Professor McGonagall stopped them $\frac{1}{4}$ of the way through the race.



- On the graph to the left draw Harry's path and Draco's path as if they had finished the entire race.
- In a different color, draw Harry's path and Draco's path that they actually travelled.
- Find McGonagall's coordinates, mark it on the graph, and describe your process.

4. How could we adjust our midpoint formula to work for any fraction of a line segment, as well as any 2 points?

$$\frac{1}{2} (x_2 + x_1)$$

r missing start.

$$x_r \quad x_s \quad x_f$$

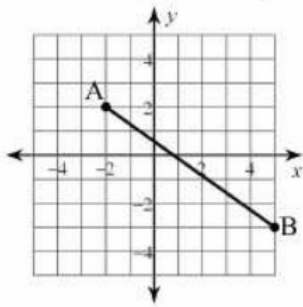
SEGMENT RATIO FORMULA:

$$\begin{aligned} \underline{x}: & \quad x_r (x_f - x_s) + x_s \\ & \quad \frac{1}{2} (x_f - x_s) + x_s \\ & \quad \frac{1}{2} x_f - \frac{1}{2} x_s + x_s \\ & \quad \frac{1}{2} x_f + \frac{1}{2} x_s \\ & \quad \frac{1}{2} (x_f + x_s) \end{aligned}$$

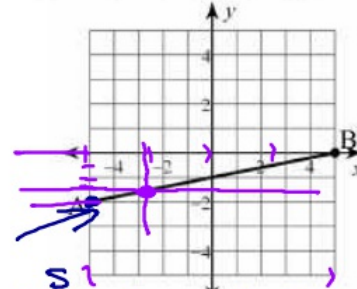
$$\underline{y}: \quad y_r (y_f - y_s) + y_s$$

$$r(f-s) + s$$

5. Find the coordinates of the point that is $\frac{2}{3}$ of the way from point A to point B.



6. Find the coordinates of the point that is $\frac{1}{4}$ of the way from point A to point B.



A(-5, -2) B(5, 0)

$$\begin{aligned} \underline{x}: & \quad \frac{1}{4} (5 + 5) + -5 \\ & \quad \frac{1}{4} (10) + -5 \\ & \quad 2.5 - 5 \\ & \quad -2.5 \end{aligned}$$

$$\begin{aligned} \underline{y}: & \quad \frac{1}{4} (0 + 2) + -2 \\ & \quad \frac{1}{4} (2) - 2 \\ & \quad .5 - 2 \\ & \quad -1.5 \end{aligned}$$

$$r(f-s) + s$$

$$\underline{r(f-s) + s}$$

7. Find the coordinates of the point that is $\frac{2}{5}$ of the way from (13, 18) to point (28, -32).

$$\begin{aligned} \underline{x}: & \quad \frac{2}{5} (28 - 13) + 13 \\ & \quad \frac{2}{5} (15) + 13 \\ & \quad 6 + 13 \\ & \quad 19 \end{aligned}$$

$$\begin{aligned} \underline{y}: & \quad \frac{2}{5} (-32 - 18) + 18 \\ & \quad \frac{2}{5} (-50) + 18 \\ & \quad -20 + 18 \\ & \quad -2 \end{aligned}$$

$$\frac{2}{5} \cdot \frac{15}{1} = \frac{30}{5} = 6$$

$$(19, -2)$$