Midpoint of #

$M = \frac{a+b}{2}$

Midpoint of points

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

(3, 7) (-2, 9)

$\frac{3+-2}{2}, \frac{7+9}{2}$

$(\frac{1}{2}, \frac{16}{2})$

mipt. = $(\frac{1}{2}, 8)$

midpoint (2, 7) | 1 endpoint (3, -5)

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

$(2, 7) = \left(\frac{3+x}{2}, \frac{-5+y}{2}\right)$

$2 = \frac{x+3}{2}$ from form

$2 \cdot 2 = 2 \cdot \frac{(x+3)}{2}$ (x) prop =

$4 = x+3$ Simplify

$4-3 = x+3-3$ (-) prop =

$1 = x$ Simplify

$x = 1$ Sym.

$7 = \frac{-5+y}{2}$ Given

$14 = -5+y$ x prop

$19 = y$ Simplify

$y = 19$ (+) prop = Simp. Sym.

2nd endpoint is (1, 19)

m: $(\frac{2}{3}, 5)$ E1: $(\frac{1}{2}, y)$

$\frac{2}{3} = \frac{\frac{1}{2}+x}{2}$ G.

$2 \cdot \frac{2}{3} = \frac{\frac{1}{2}+x}{2} \cdot 2$ x prop

$\frac{4}{3} = \frac{1}{2} + x$ Simp.

$\frac{4}{3} - \frac{1}{2} = \frac{1}{2} - \frac{1}{2} + x$ (-) prop =

$\frac{4 \cdot 2}{3 \cdot 2} - \frac{1 \cdot 3}{2 \cdot 3} = x$ Simp.

$\frac{8}{6} - \frac{3}{6} = x$ PEMDAS (LT)

$\frac{5}{6} = x$

$x = \frac{5}{6}$ Sym.

$$\frac{3x+7}{2} - 6 = 8$$

$$2 \cdot \left(\frac{3x}{2} + \frac{7}{2} - 6 = 8 \right)$$

$$3x + 7 - 12 = 16$$

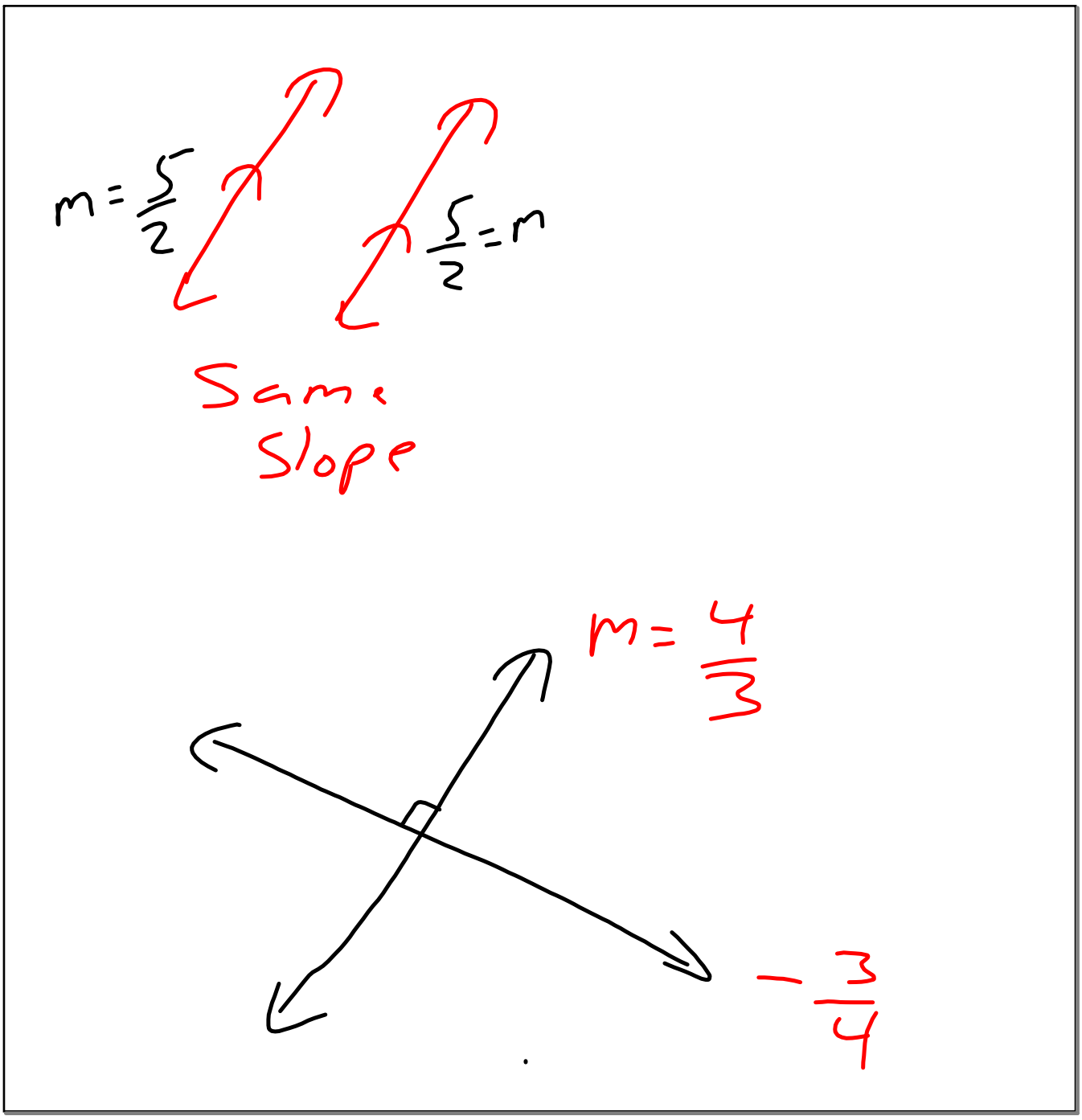
$$3 \left(\frac{4}{3} - \frac{1}{2} = \frac{1}{2} - \frac{1}{2} + x \right)$$

$$2 \cdot \left(4 - \frac{3}{2} = \frac{3}{2} - \frac{3}{2} + 3x \right)$$

$$8 - 3 = 3 - 3 + 6x$$

$$5 = 6x$$

$$x = \frac{5}{6}$$


$m = \frac{5}{2}$
$\frac{5}{2} = m$
Same Slope
$m = \frac{4}{3}$
$-\frac{3}{4}$

Slope - int

$y = mx + b$

Standard form

$Ax + By = C$

Point Slope form

$y = m(x - x_1) + y_1$

mx

slope

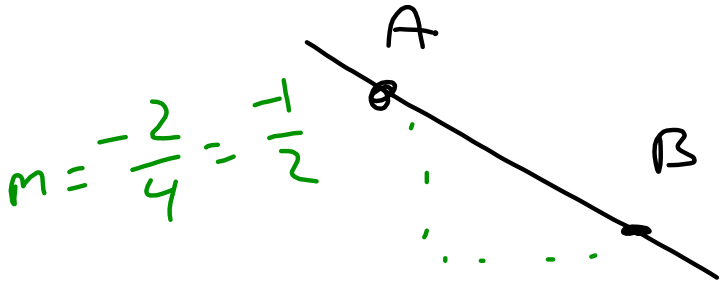
$m = \frac{y_2 - y_1}{x_2 - x_1}$

$Ax + By = C$

$-Ax \qquad -Ax$ + inv

$\frac{By}{B} = \frac{-Ax + C}{B}$ ÷ prop

$y = -\frac{A}{B}x + \frac{C}{B}$



$m = \frac{-2}{4} = \frac{-1}{2}$

$(-4,-1)$ P

$m = -\frac{1}{2}$

(x_1, y_1)

$(-4, -1)$

$y = m(x - x_1) + y_1$

$y = -\frac{1}{2}(x - -4) + -1$

$y = -\frac{1}{2}x - \frac{4}{2} - 1$

$y = \frac{-1}{2}x - 2 - 1$

$y = -\frac{1}{2}x - 3$

$y = mx + b$

PEMDAS point slope formula and you will get slope-int

$(5, 7)$ $(-8, -2)$

x_1, y_1 x_2, y_2

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{-2 - 7}{-8 - 5} \qquad \frac{-9}{-13} = \frac{9}{13}$$

Slope

$(5, 7)$

$$y = m(x - x_1) + y_1$$

$$y = \frac{9}{13}(x - 5) + 7$$

$$y = \frac{9x}{13} - \frac{45}{13} + \frac{7 \cdot 13}{1 \cdot 13}$$

$$y = \frac{9}{13}x - \frac{45}{13} + \frac{91}{13}$$

$$y = \frac{9}{13}x + \frac{46}{13}$$