

3.8

Slope - Intercept Form

$$y = mx + b$$

Slope m

$$y = mx + b$$

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

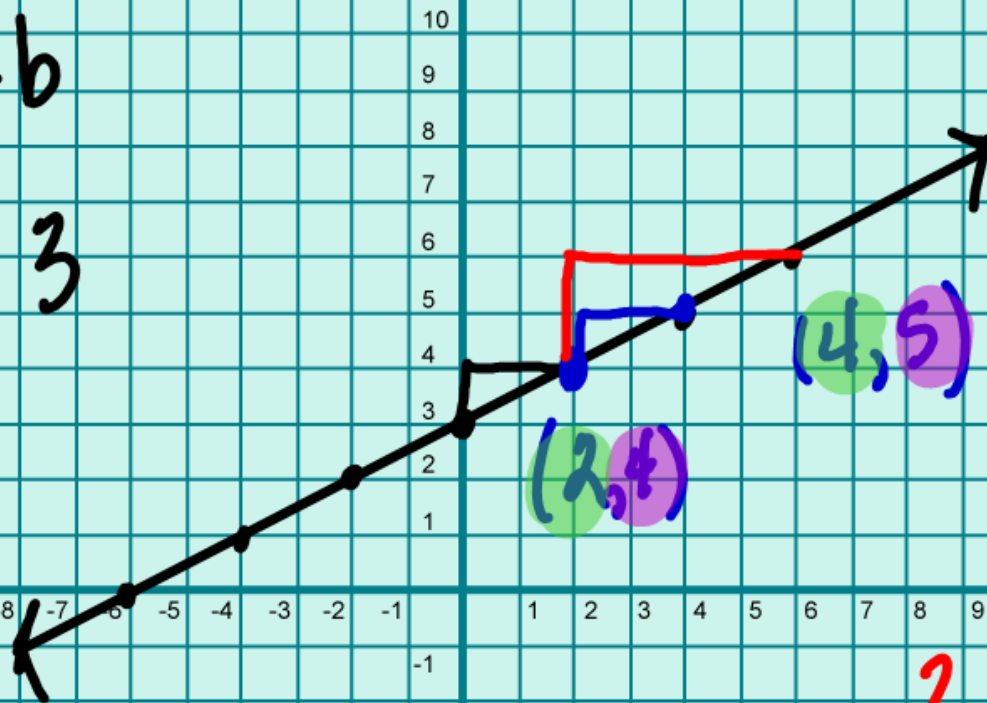
$$m = \frac{\text{rise}}{\text{run}}$$

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

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

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

$$m = \frac{4-5}{2-4} = \frac{-1}{-2} = \frac{1}{2} \quad m = \frac{5-4}{4-2} = \frac{1}{2}$$



$$m = \frac{y_1 - y_2}{x_1 - x_2} \quad \frac{\text{difference of } y\text{'s}}{\text{difference of } x\text{'s}}$$

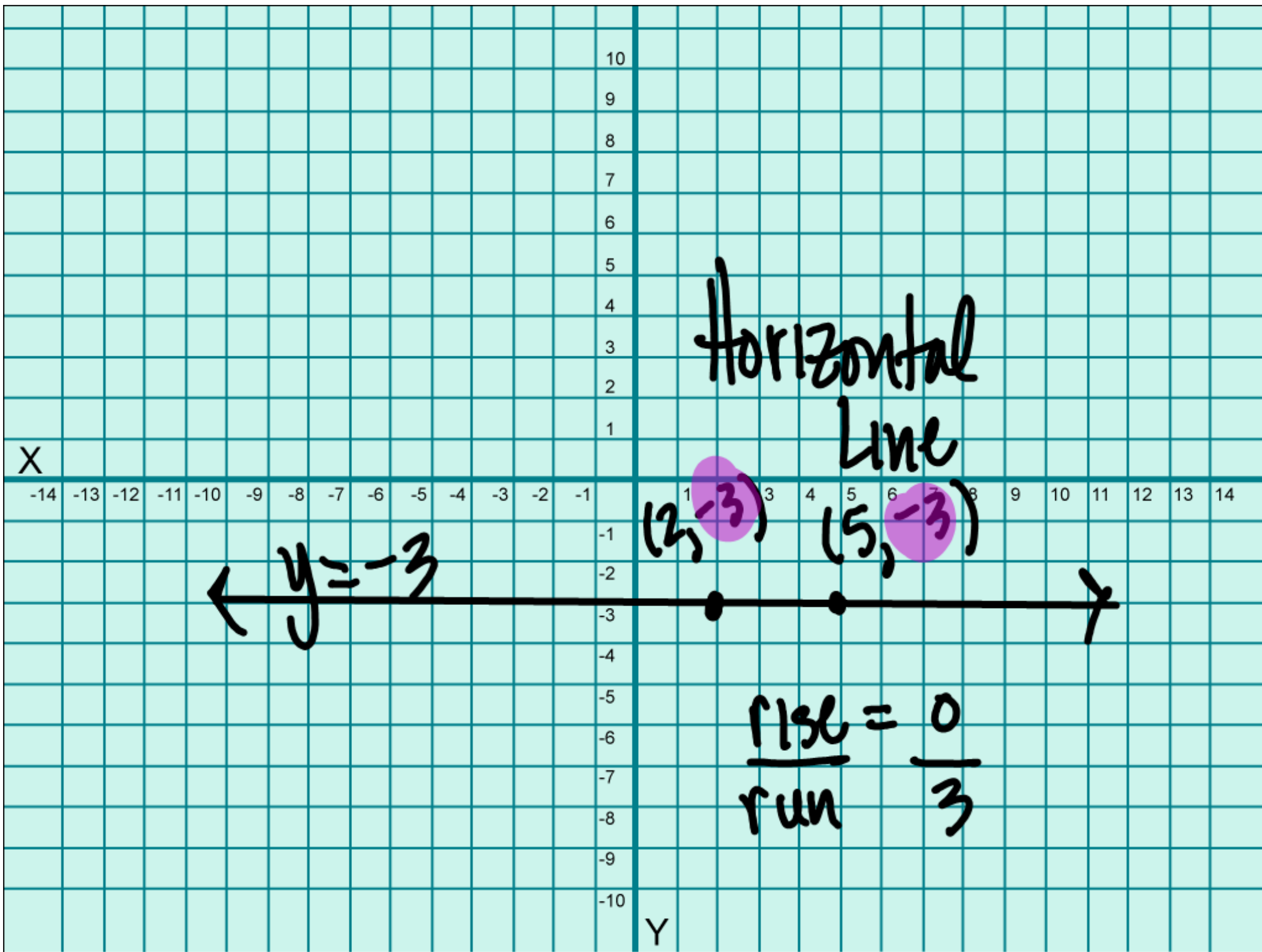
$$(3, -1) \quad (-5, 2) \quad \frac{\text{rise}}{\text{run}}$$

$$m = \frac{2 - (-1)}{-5 - 3} = \frac{3}{-8} = -\frac{3}{8} = -\frac{3}{8}$$

$$(2, -3) \quad (5, -3)$$

$$m = \frac{-3 + 3}{5 - 2} \quad y = -3$$

$$m = \frac{0}{3} = 0 \quad \text{Horizontal Line}$$



$(4, 1)$

$(4, 2)$

X

-14 -13 -12 -11 -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 1 2 3 4 5 6 7 8 9 10 11 12 13 14

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

$$m = \frac{1}{0}$$

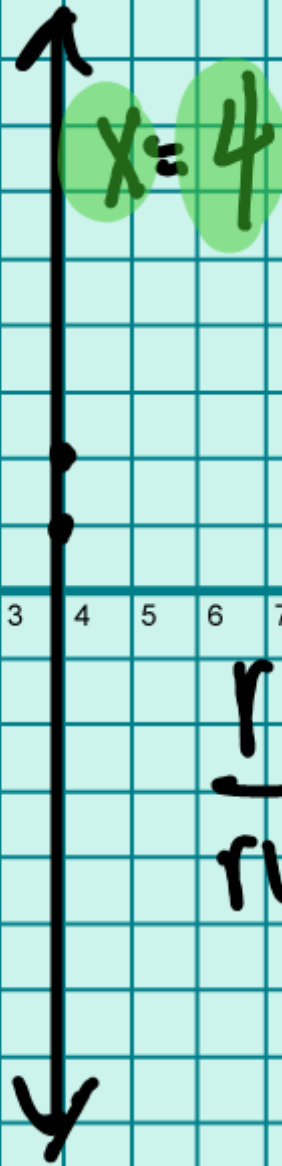
~~undefined~~

rise
run 0

10
9
8
7
6
5
4
3
2
1

-1
-2
-3
-4
-5
-6
-8
-9
-10

Y



Parallel Lines
 Same Slope
 Different y-intercepts

X

-14 -13 -12 -11 -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 1 2 3 4 5 6 7 8 9 10 11 12 13 14

10
9
8
7
6
5
4
3
2
1
-1
-2
-3
-4
-5
-6
-7
-8
-9
-10
Y

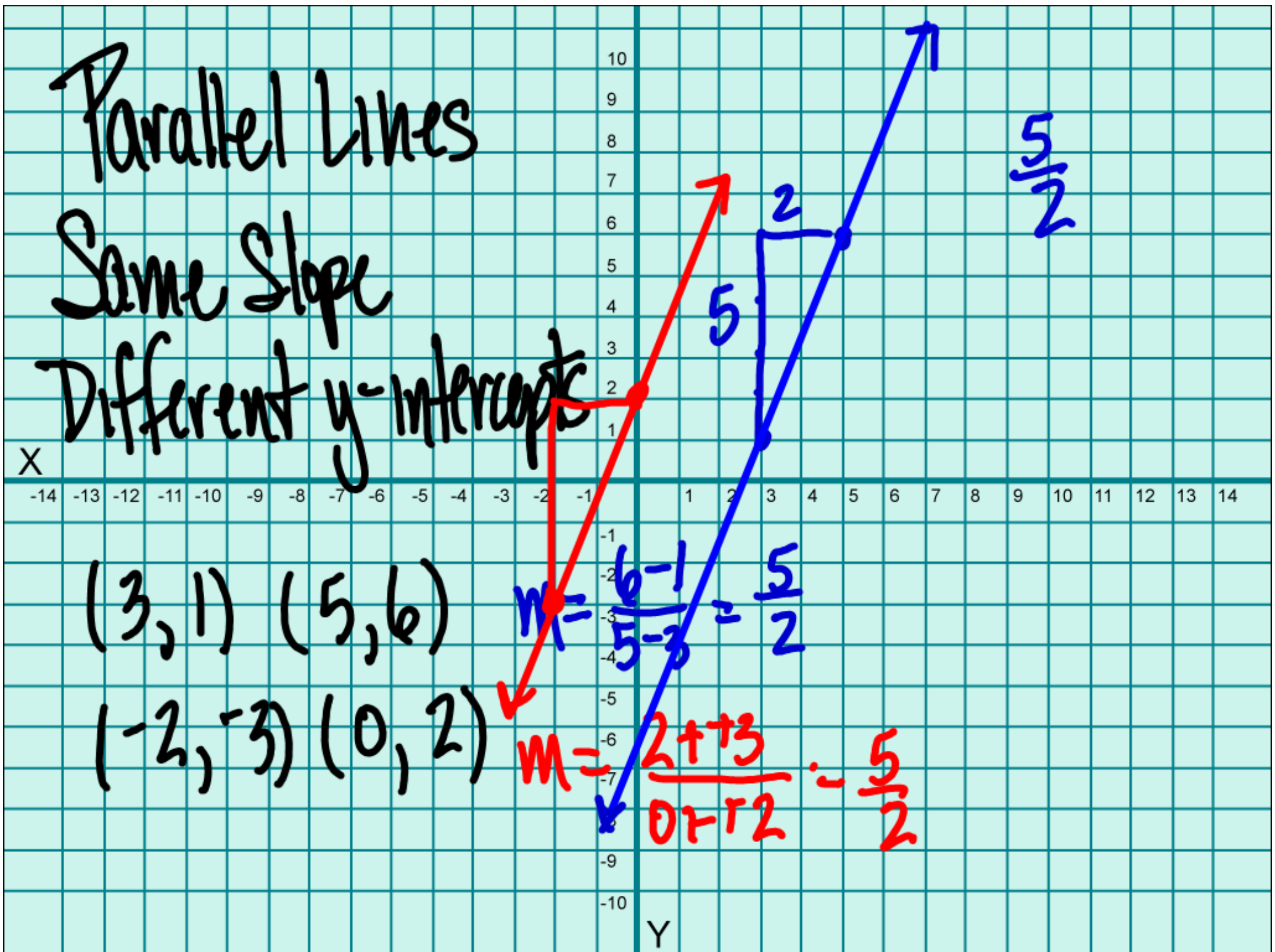
$\frac{5}{2}$

$(3, 1)$ $(5, 6)$

$(-2, -3)$ $(0, 2)$

$$m = \frac{6 - 1}{5 - 3} = \frac{5}{2}$$

$$m = \frac{2 + 3}{0 - (-2)} = \frac{5}{2}$$



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

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

X

-14 -13 -12 -11 -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 1 2 3 4 5 6 7 8 9 10 11 12 13 14

10
9
8
7
6
5
4
3
2
1
-1
-2
-3
-4
-5
-6
-9
-10
Y

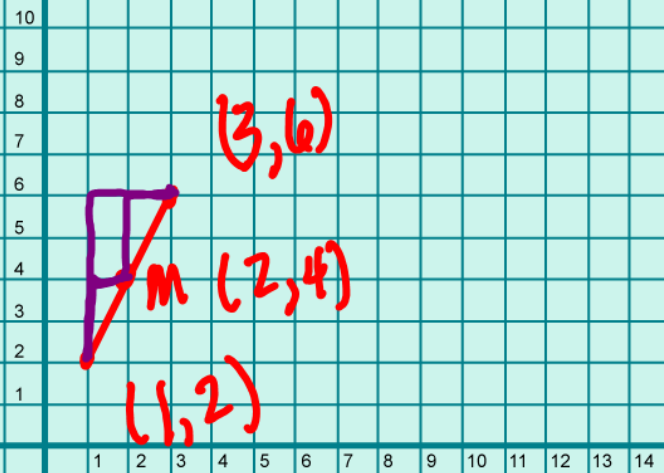
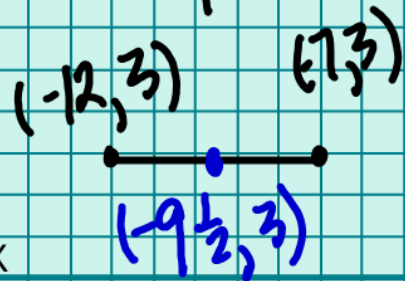


Perpendicular

Opposite Sign
Reciprocal



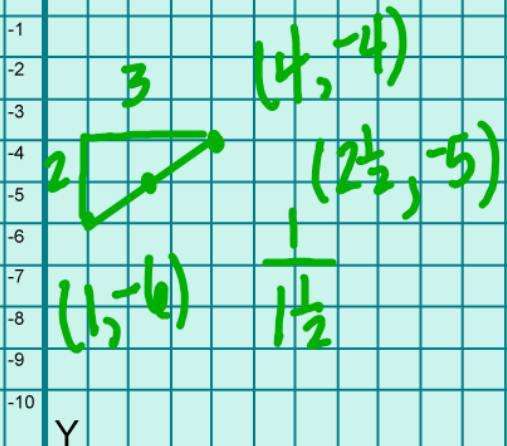
Midpoint:



$$\left(\frac{-12 + -7}{2}, \frac{3 + 3}{2} \right)$$

$$\left(\frac{-19}{2}, \frac{6}{2} \right)$$

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



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

$$\left(\frac{4 + 1}{2}, \frac{-4 + -6}{2} \right)$$

$$\left(\frac{5}{2}, \frac{-10}{2} \right)$$

$$\left(2\frac{1}{2}, -5 \right)$$

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