

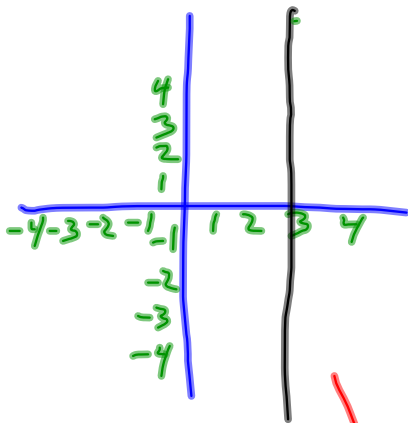
Linear functions and slope

$$\text{slope} = m = \frac{y_2 - y_1}{x_2 - x_1} \quad \text{you need 2 points}$$

$$\begin{matrix} (4, -2) & (-5, -3) & \text{calculate slope} \\ x_1 & y_1 & x_2 & y_2 \end{matrix}$$

$$\frac{-3 - (-2)}{-5 - 4} = \frac{-1}{-9} = \frac{1}{9}$$

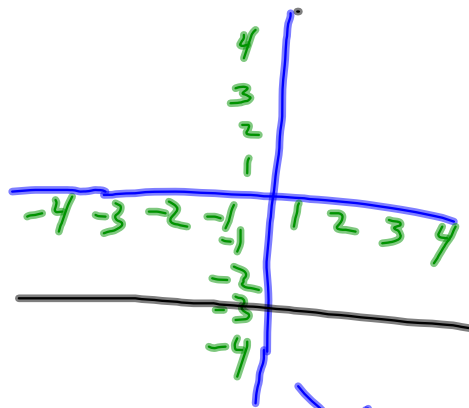
calculate slope



$$\begin{pmatrix} 3 \\ x_1, y_1 \end{pmatrix} \\ \begin{pmatrix} 3 \\ x_2, y_2 \end{pmatrix}$$

$$m = \frac{0 - 1}{3 - 3} = \frac{-1}{0}$$

undefined
vertical



$$\begin{pmatrix} -2 \\ x_1, y_1 \end{pmatrix} \quad \begin{pmatrix} 0 \\ x_2, y_2 \end{pmatrix}$$
$$\frac{-3 - -3}{0 - -2} = \frac{0}{2} = 0$$

horizontal

slope intercept form of a linear equation

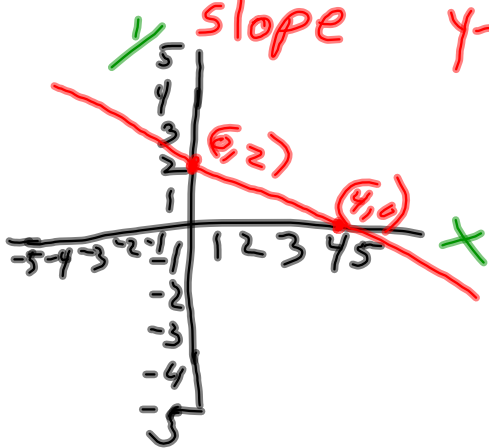
$$y = mx + b$$



slope



y-intercept



Pull 2 points and write the equation of the line in slope intercept form

$$y = \underline{4}x - \underline{6}$$

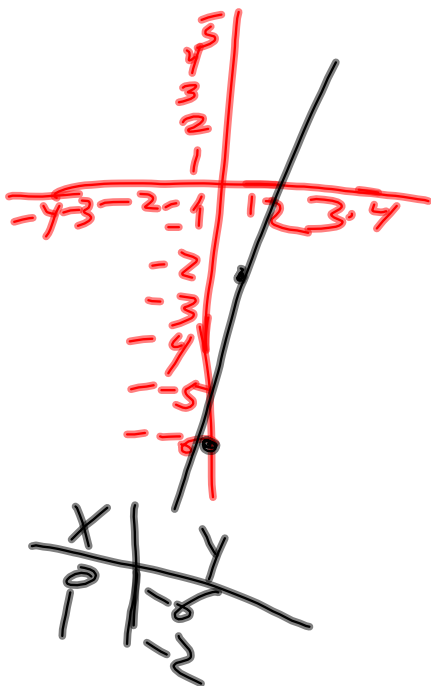
what is slope?
what is y-intercept?

Graph it:

Ⓐ Create a table

or:

Ⓑ Plot the y-intercept
and then visually count
using the slope.



Graph

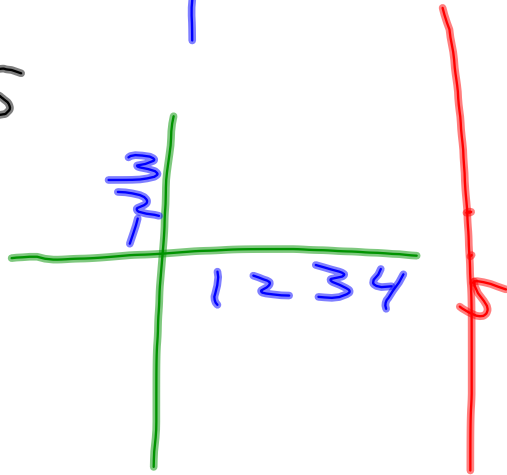
$$y = 3$$



0, 3
1, 3

Graph

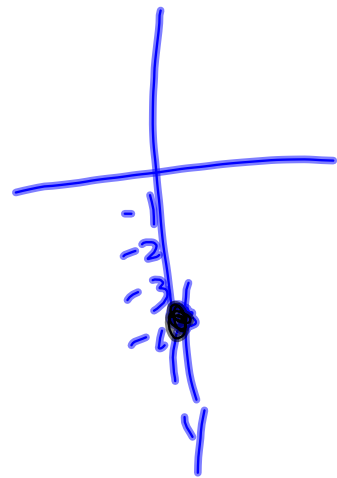
$$x = 5$$



Given $(-3, 1)$ and $(0, -4)$
Write the equation of the
line in slope intercept
form.

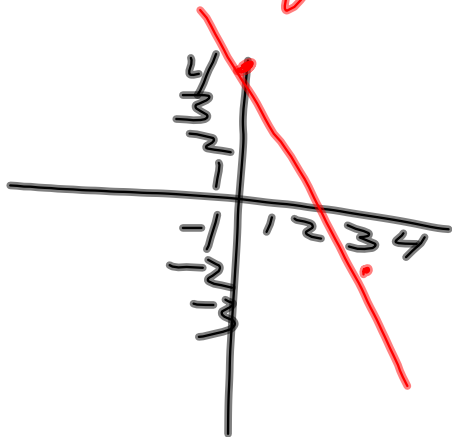
$$m = \frac{-4 - 1}{0 - -3} = \frac{-5}{3} \quad b = -4$$

$$y = mx + b$$
$$y = -\frac{5}{3}x - 4$$



$$y = -\frac{5}{3}x + 4$$

graph it

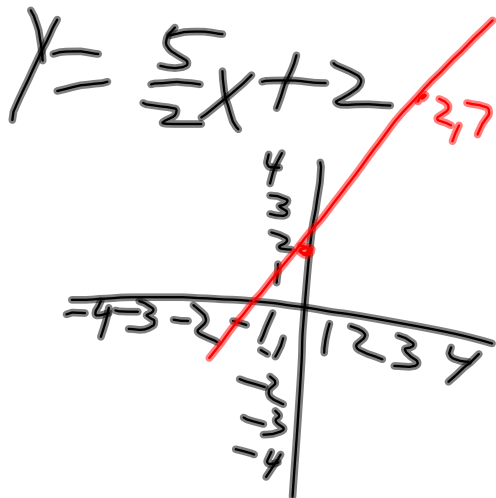


x	y
0	4
3	-1

Find the slope and y-intercept. Graph it.

$$5x - 2y = -4$$

$$y = mx + b$$



x	y
0	2
2	7

Let's do Ex. 4 on p. 155

Let's do Ex 5 on p. 156

$$4x - 3y = 6$$

Find the slope and y-intercept:

① Convert to slope intercept form $y = mx + b$ (get y by itself)

$$-3y = -4x + 6$$

$$\frac{-3}{-3} y = \frac{-4}{-3} x + \frac{6}{-3}$$

$$y = \frac{4}{3}x - 2$$

$$m = \frac{4}{3} \quad b = -2$$

Convert to slope intercept form

$$y+4 = -3(x-1) \quad \text{Distribute}$$

$$y+4 = -3x+3 \quad \text{Get } y \text{ by itself}$$

$$\boxed{y = -3x - 1}$$

$$y-5 = -3(x+2)$$

$$y-5 = -3x-6$$

$$\begin{array}{l} +5 \\ +5 \end{array} \quad \boxed{y = -3x - 1}$$

① Parallel lines have the same slope and different y-intercepts

② Identical lines have the same slope and the same y-intercepts.

③ The slopes of perpendicular lines are the negative reciprocals of each other.

$$\frac{3}{4} \quad -\frac{4}{3}$$

Let's do Ex 8 on p.159.