

## Graphing linear functions

Choose 2 points. Always choose  $x$ .

$$f(x) = -2x - 4$$

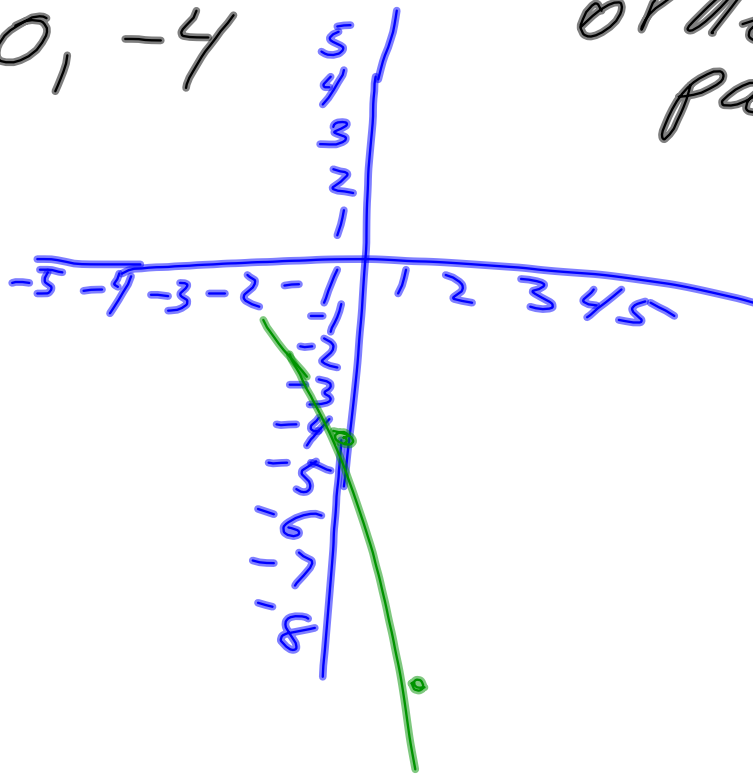
x	Calculation	y	ordered Pair (x,y)
2	$f(2) = -2(2) - 4$	-8	(2, -8)
0	$f(0) = -2(0) - 4$	-4	(0, -4)

plot the  
ordered pairs

$2, -8$

$0, -4$

plot the  
ordered  
pairs



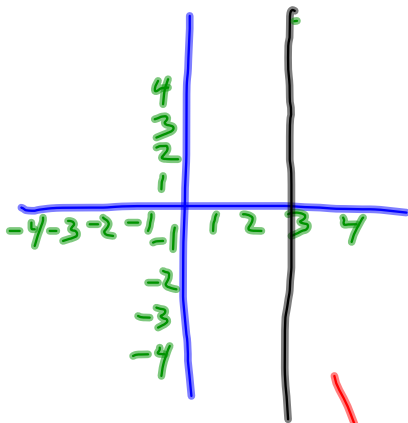
## Linear functions and slope

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

$(4, -2)$     $(-5, -3)$    calculate slope  
 $x_1$     $y_1$     $x_2$     $y_2$

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

calculate slope

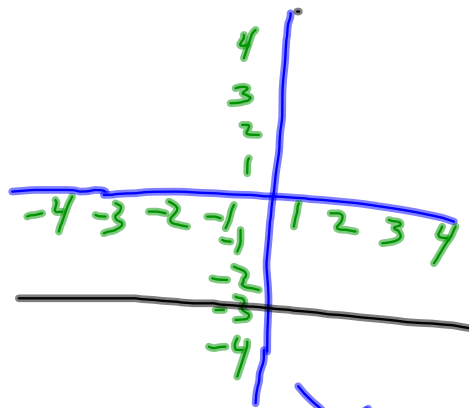


$$\begin{pmatrix} 3 \\ x_1, y_1 \end{pmatrix}$$

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

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

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

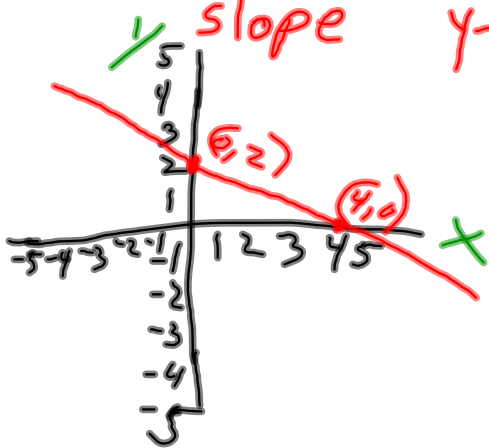
$$y = mx + b$$



slope



y-intercept



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

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

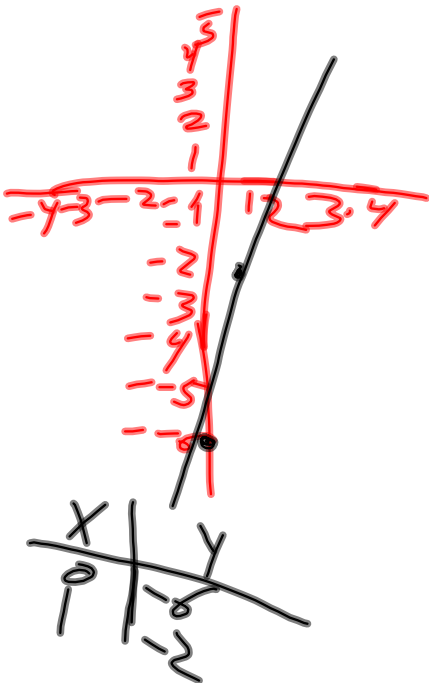
what is slope?  
what is y-intercept?

Graph it:

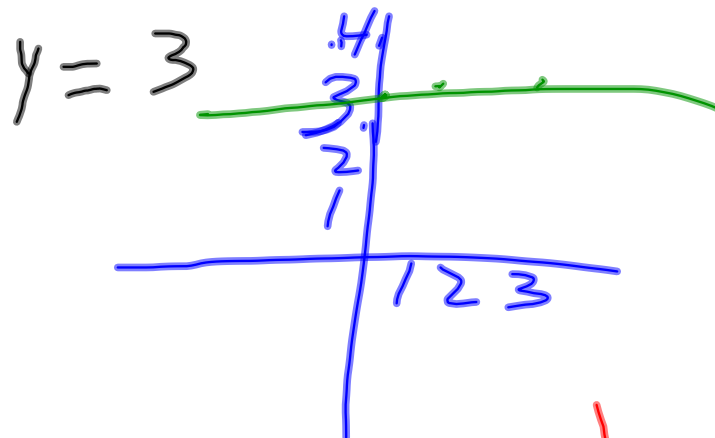
Ⓐ Create a table

or:

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



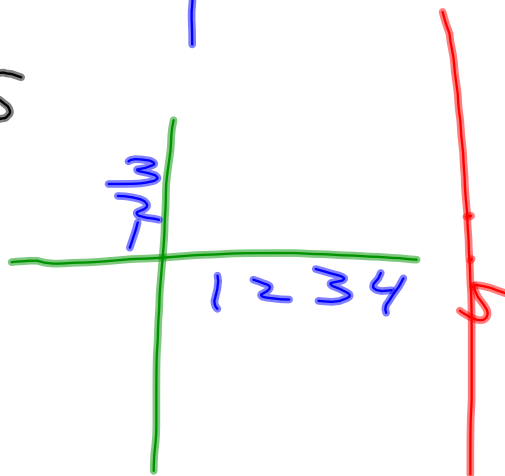
Graph



0, 3  
1, 3

Graph

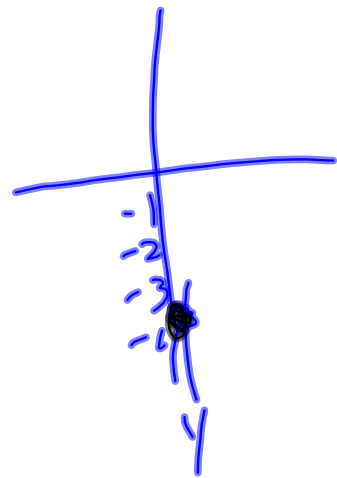
$x = 5$



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

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

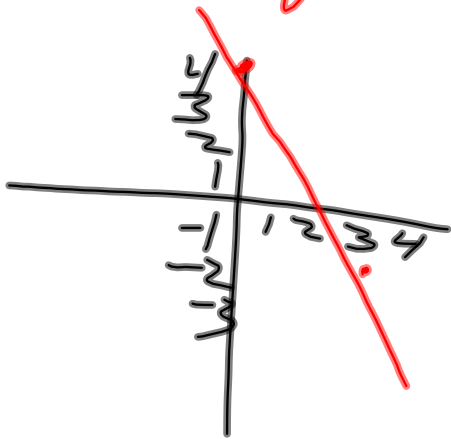
$$y = mx + b$$
$$y = -\frac{5}{3}x - 4$$





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

graph it



x	y
0	4
3	-1

## Standard Form of a Linear Equation

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$$Ax + By = C$$

\*A is always positive

A and B are coefficients

- Ⓐ Put 0 in for x and find the y-intercept
- Ⓑ Put 0 in for y and find the x-intercept
- Ⓒ Graph the x and y intercepts

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

$$5(0) - 2y = -4$$

$$\begin{array}{r} -2y = -4 \\ \underline{-2} \quad \underline{-2} \end{array}$$

$$y = 2$$

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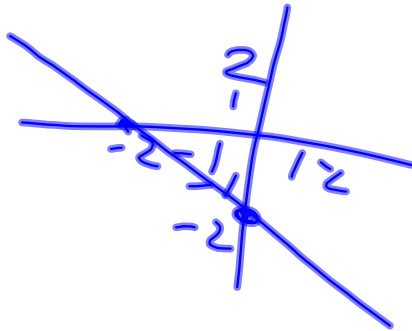
$$5x - 2(0) = -4$$

$$\begin{array}{r} 5x = -4 \\ \underline{5x} \quad \underline{-4} \end{array} \quad x = \frac{-4}{5}$$

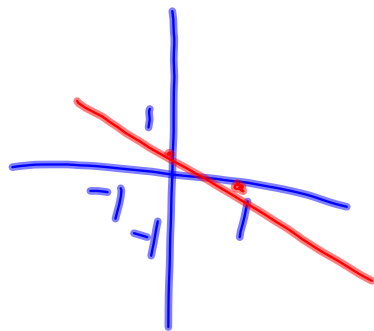
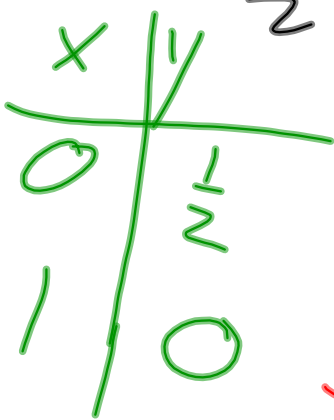


Graph  $x + y = -2$

x	y
0	-2
-2	0



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



$$\frac{1}{2}(0) + y = \frac{1}{2}$$
$$y = \frac{1}{2}$$

$$\frac{1}{2}x + 0 = \frac{1}{2}$$

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

Let's do all Examples  
in 3.3 starting on p. 144.