Your Name

Mrs. T

11/18/2020

Notes

3.5

Slope- Intercept Form and Graphs

Objective: To be able to write an equation of the line given the slope and y-intercept, written or from a graph. To be able to graph an equation using the slope and intercept.

Life Lesson/Skill: Many things are a sum of their parts, and equations for lines are no different.

Before we graph other functions that have y-intercepts, we need to be able to graph linear equations. We will be graphing multiple lines on a plane, so the graphing part needs to be easy.

slope-intercept form

$y = mx + b$

m is the slope (steapness/incline, the amount that's added every time)

b is the y-intercept (where it starts on y axis)

Determine the Slope and y-Intercept

Given: Slope Intercept Form

Slope is # infront of x

y-intercept is # added and is (0, b)

ex. $y = -3x - 5$ ($y = mx + b$)

slope: $m = -3 = \frac{-3}{1} = \frac{3}{-1}$

Y-intercept: $(0, -5)$, $b = -5$

$y = \frac{2}{3}x + 9$

slope: $m = \frac{2}{3} = \frac{-2}{-3} = 0.\overline{6}$

Y-intercept: $(0, 9)$, $b = 9$

Examples: Write the slope and y -intercept of each line.

1) $y = 2/3\,x - 5$

$b = -5 \quad (0, -5)$

$m = \frac{2}{3} = \frac{-2}{-3} = 0.\overline{66}$

2) $y = -3/5x - 3$

$b = -3 \quad (0, -3)$

$m = -\frac{3}{5} = \frac{-3}{5} = \frac{3}{-5} = -0.6$

3) $y = 4x + 3$

$b = 3 \quad (0, 3)$

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

4) $y = 7/6\,x - 8$

$b = -8 \quad (0, -8)$

$m = \frac{7}{6} = \frac{-7}{-6} = 1.\overline{16}$

Graphing a Line

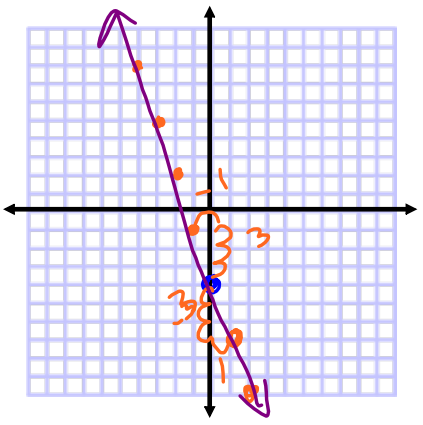
1. Make a point at the y-intercept (0,b)
2. From the point move up and over the slope and make a point where you finish
3. Connect the points with a straight line

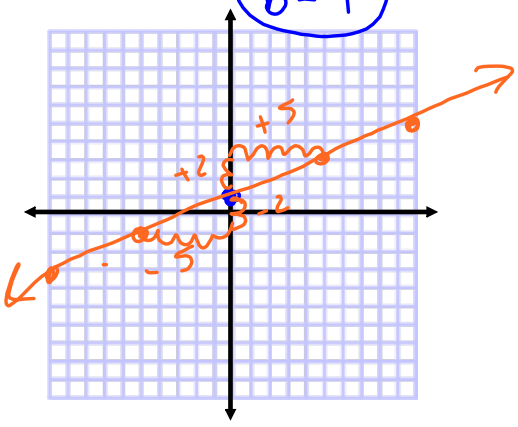
(0, b)

(0, -4) $m = -3 = \frac{-3}{1} = \frac{3}{-1}$

$y = \frac{2}{5}x + 1$ $\quad m = \frac{2}{5} = \frac{-2}{-5} = 0.2$

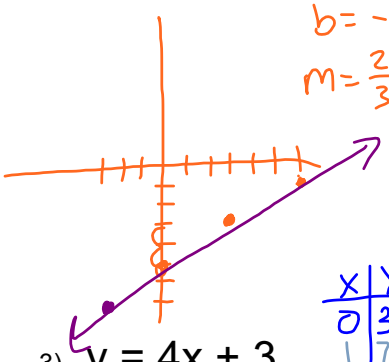
$b = 1$



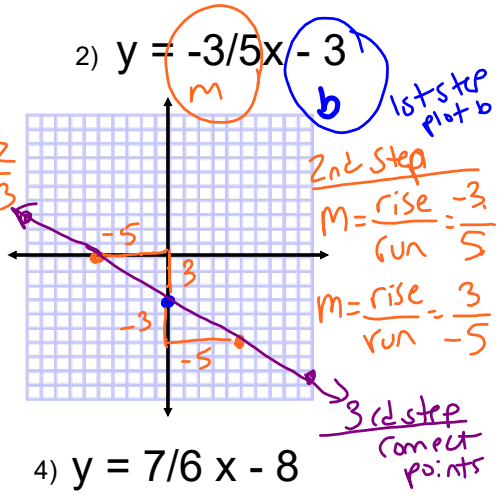


Graph each equation using slope and y intercept.

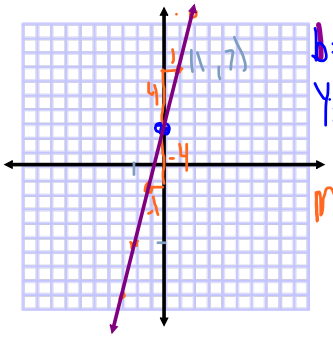
1) $y = 2/3\,x - 5$



2) $y = -3/5x - 3$

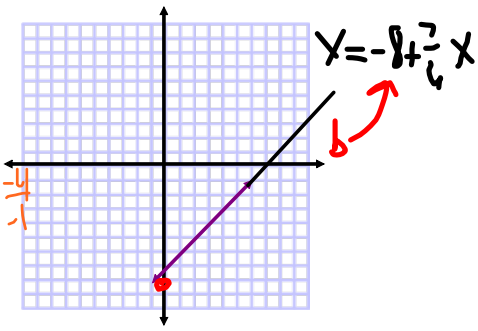


3) $y = 4x + 3$



x	y
0	3
1	7
-2	-5

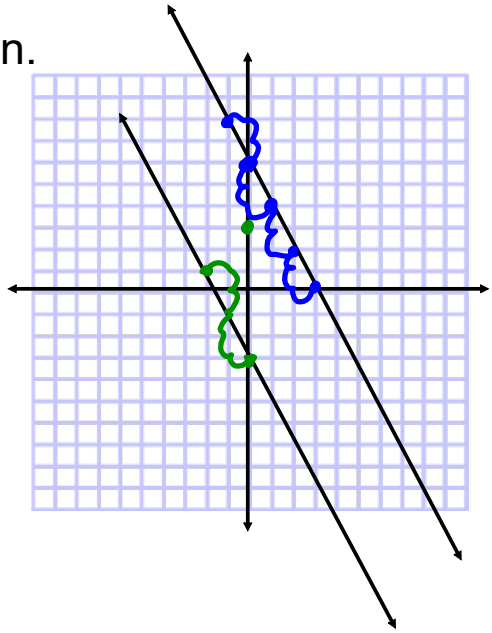
4) $y = 7/6\,x - 8$



Graph the equation.

$y = -2x + 6$

1) $m = -2/1$ $b = 6$
2) (0,6) down 2 right 1
3)



$4x + 2y = -6$

$-4x \quad -4x$

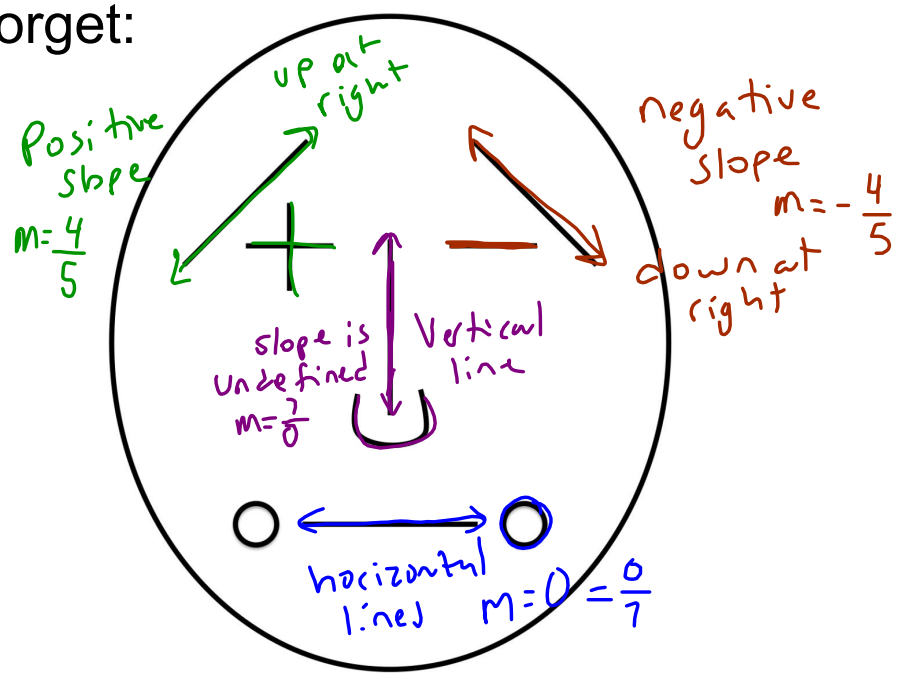
$\frac{2y}{2} = \frac{-4x + 6}{2}$

$y = -2x - 3$

1) $m = -2/1$ $b = -3$
2) plot (0,-3)
3) move $\frac{-2}{1}$

Quiz Review

Don't forget:



MR. SLOPE GUY

Finding Slope from Points

1. label the first coordinates x_1 and y_1
2. label the second coordinates x_2 and y_2
3. Substitute and simplify

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

(13,-5), (-9,6) (5,-4), (7,-4)

1st 2nd

x_1 y_1 x_2 y_2

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

(2,-3), (2,8) (-1,-3), (-2,-8)

-

Examples: Write the slope and y -intercept of each line.

1) $y = \frac{2}{3}x - 5$

b= (0, _)

m= = =

2) $y = -3/5x - 3$

3) $y = 4x + 3$

4) $y = 7/6\ x - 8$

Graph the following linear equation using slope and y-intercept.

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

Steps

1) Find the slope and y-intercept.

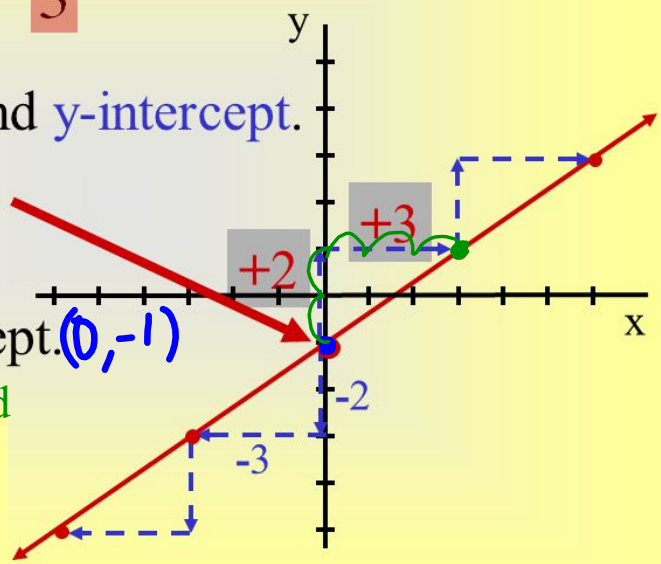
$m = \frac{2}{3}$ $b = -1$

2) Plot the y-intercept. (0, -1)

3) Move the slope, and plot 2nd point

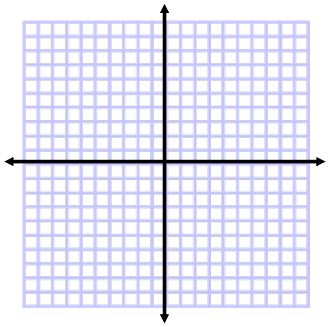
$m = \frac{2}{3}$ or $m = \frac{-2}{-3}$

4) Draw line through points.

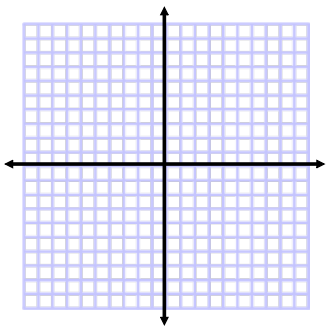


Graph each equation using slope and y intercept.

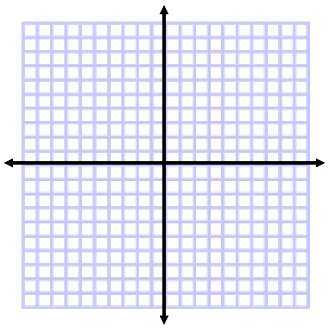
1) $y = \frac{3}{4}x - 3$ $m = \frac{rise}{run}$ b



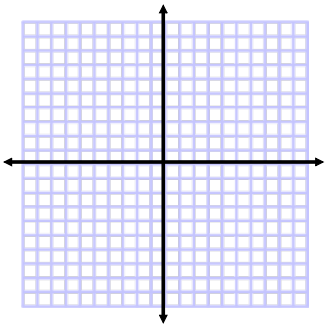
2) $y = -x + 2$



3) $y = -5/6x$



4) $y = x - 8$



Writing a Slope Intercept Equation for a Line

Given: Slope and y-intercept

Think! What do I need to write a linear equation?

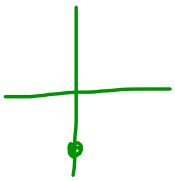
1. plug y-intercept in for b
2. plug the slope in for m in to

y=mx+b

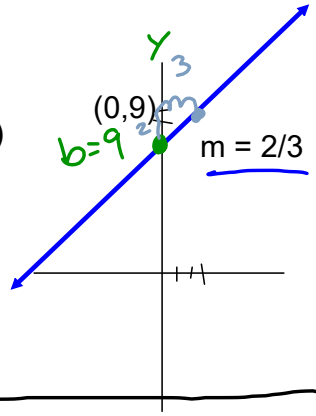
ex. 1) (0,-5), m = -3

x is 0, -5 is b

$y = -3x + -5$



ex. 2)



$y = \frac{2}{3}x + 9$

$m = \frac{2}{3}$

$b = 9$

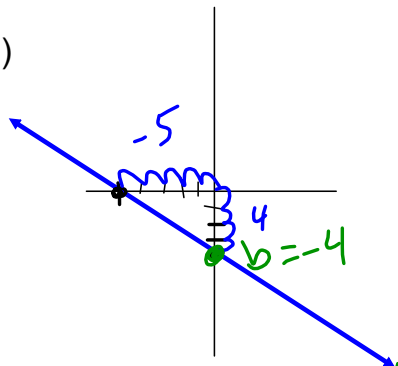
Examples: Write the equation for the Line

1) (0,7), m = 2/3

b

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

2)



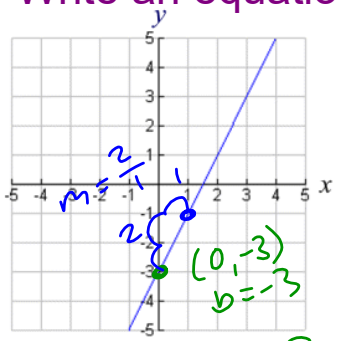
$y = -\frac{4}{5}x + -4$

3) (0,3), m = 4

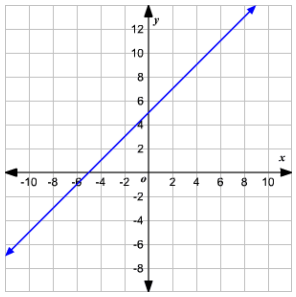
$y = \_\_x + \_\_$

4) (0, -8) m = $\frac{7}{6}$

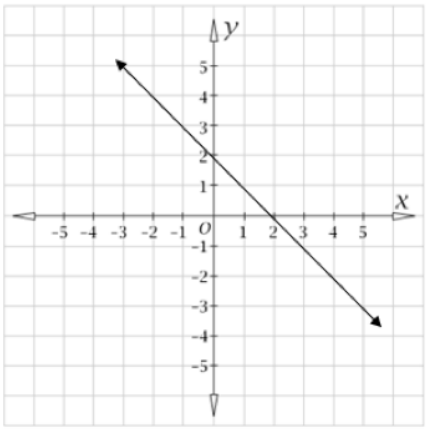
Write an equation in slope intercept form.



y = 2x + -3



y =



y =

(0, 3) (7, 8)

$m = \frac{y_1 - y_2}{x_1 - x_2} = \frac{3-8}{0-7} = \frac{-5}{-7} = \frac{5}{7}$

$m = \frac{5}{7}$

Examples: Write the equation for the Line

1) (0,-5), m = 2/3

x is 0 so y = b

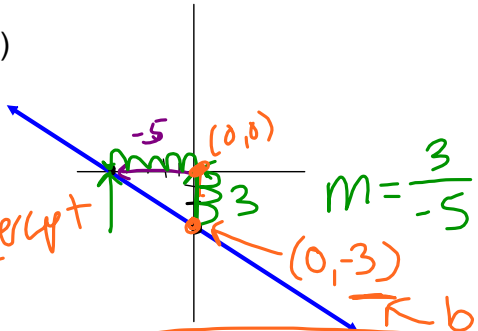
$y = \frac{2}{3}x + -5$

m slope, b y intercept

b = -5

$y = \frac{2}{3}x - 5$

2)



$m = \frac{3}{-5}$

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

3) (0,3), m = 4

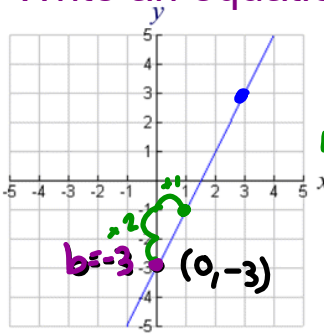
b

$y = 4x + 3$

4) (0, -8) $m = \frac{7}{6}$

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

Write an equation in slope intercept form.

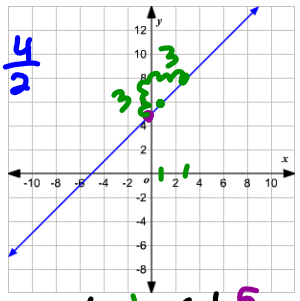


$m = \frac{2}{1}$ $\frac{6}{3}$ $\frac{4}{2}$

m = 2

$y = 2x + -3$

$y = 2x - 3$

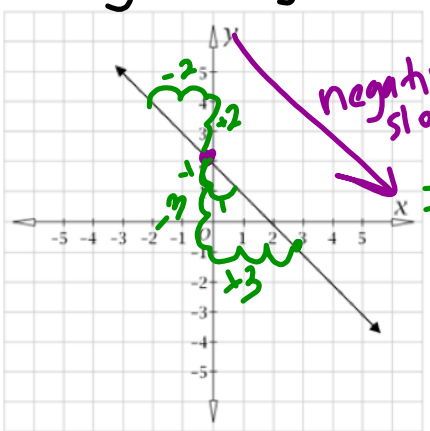


$m = \frac{3}{3} = 1$

b = 5

$y = 1x + 5$

$y = x + 5$



negative slope

$\frac{2}{-2}$ or $\frac{-3}{3}$ or $\frac{-1}{1} = -1 = m$

$y = -x + 2$

Write a linear equation in slope intercept form to model the situation.

The car mechanic charges $75 for the consultation and $45 per hour.

m x

X = # hrs worked

y = total earned

m = 45

amount affected by change

'per'

'for each'

b = 75

starting amount

(0, 75)

(0 hrs, $75)

$y = 45x + 75$