Homework Qs

Note Title

~~2/5/2015~~ 2/8/2015

3.2 #27 $y = 6x$ Which of these are solutions? $(1,6)$, $(-2,12)$, $(0,0)$

$x=1, y=6$ $6 = 6(1)$, $6=6$ True ✓ Yes, it's a solution.

$x=-2, y=12$ $12 = 6(-2)$, $12 = -12$ False No, not a solution

$x=0, y=0$ $0 = 6(0)$, $0=0$ True ✓ Yes, this is a solution.

The pairs $(1,6)$ and $(0,0)$ are solutions.

3.3 cont'd (Graphing Lines using Intercepts)

Ex: Graph $2y = 8x$. Find the intercepts.

Find the x-intercept: Set $y=0$:

$2(0) = 8x$

$0 = 8x$

$\frac{0}{8} = \frac{8x}{8}$

$0 = x$

x-intercept: 0

ordered pair: $(0,0)$

Find the y-intercept: Set $x=0$:

$2y = 8(0)$

$2y = 0$

$\frac{2y}{2} = \frac{0}{2}$

$y = 0$

y-intercept: 0

ordered pair: $(0,0)$

Need to find another point:

Solve for y:

$2y = 8x$

$\frac{2y}{2} = \frac{8x}{2}$

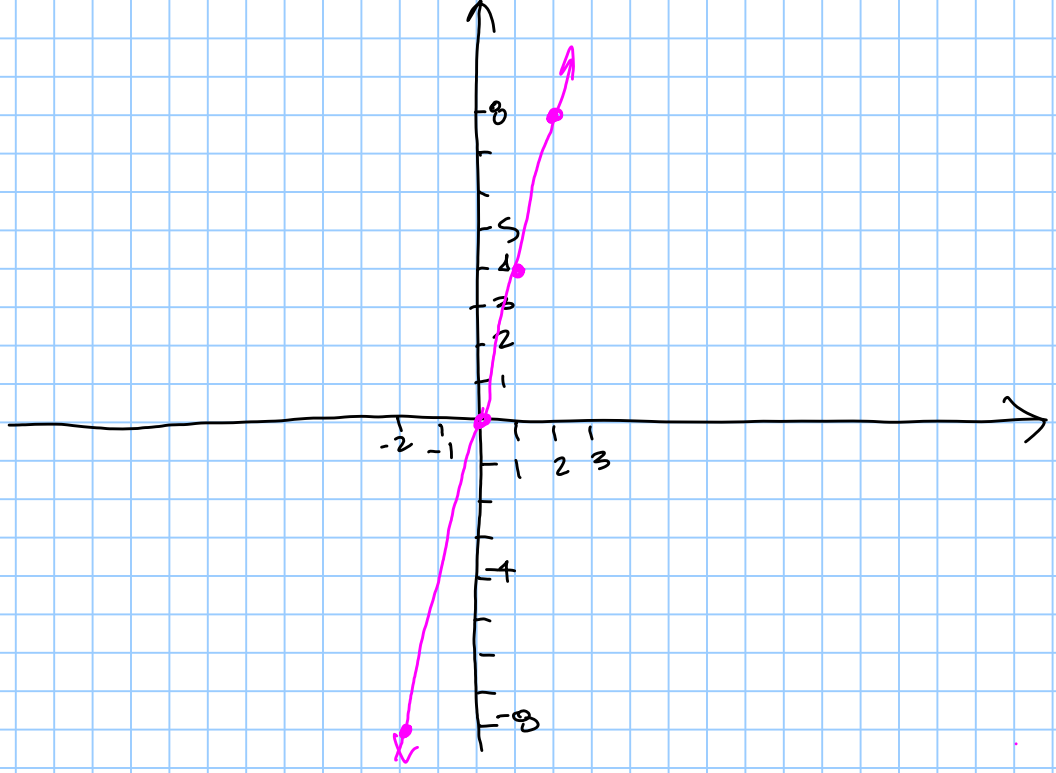
$y = 4x$

$x = 2 \Rightarrow \quad y = 4(2) = 8 \quad (2,8)$

$x = -2 \Rightarrow \quad y = 4(-2) = -8 \quad (-2,-8)$

$x = 1 \Rightarrow \quad y = 4(1) = 4 \quad (1,4)$

Graph on next page



(0,0)
(2,8)
(-2,-8)
(1,4)

Ex: graph $y = -\frac{4}{3}x$

Find x-intercept: Set $y=0$: $0 = -\frac{4}{3}x$

$(-\frac{3}{4})(0) = (-\frac{4}{3}x)(-\frac{3}{4})$

$0 = x$ **x-intercept: 0** ordered pair (0,0)

Find y-intercept: Set $x=0$: $y = -\frac{4}{3}(0)$

$y = 0$

y-intercept: 0 ordered pair: (0,0)

Need another point: $y = -\frac{4}{3}x$

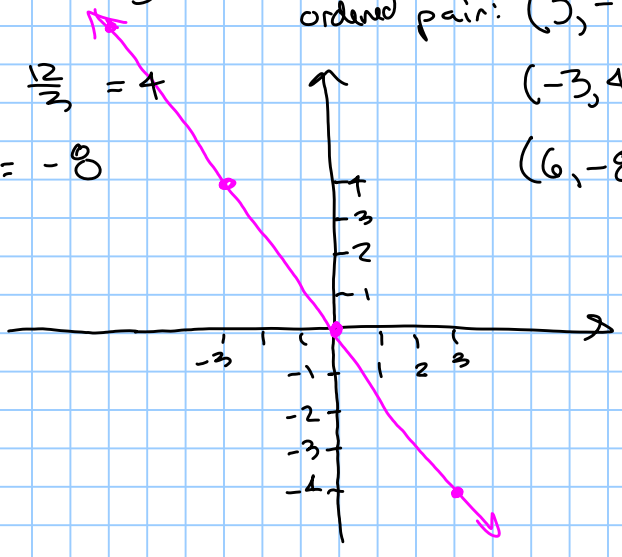
$x = 3 \Rightarrow y = -\frac{4}{3}(3) = \frac{-12}{3} = -4$ ordered pair: (3,-4)

$x = -3 \Rightarrow y = -\frac{4}{3}(-3) = \frac{12}{3} = 4$ (-3,4)

$x = 6 \Rightarrow y = -\frac{4}{3}(6) = -8$ (6,-8)

$x = -6 \Rightarrow y = -\frac{4}{3}(-6) = \frac{8}{1} = 8$

(-6,8)



Ex: Graph $3x + 2y = -15$

Find x-intercept: Set $y=0$: $3x+2(0)=-15$

$3x = -15$

$\frac{3x}{3} = \frac{-15}{3}$

$x = -5$ pair: $(-5, 0)$

x-intercept: -5 or $(-5,0)$

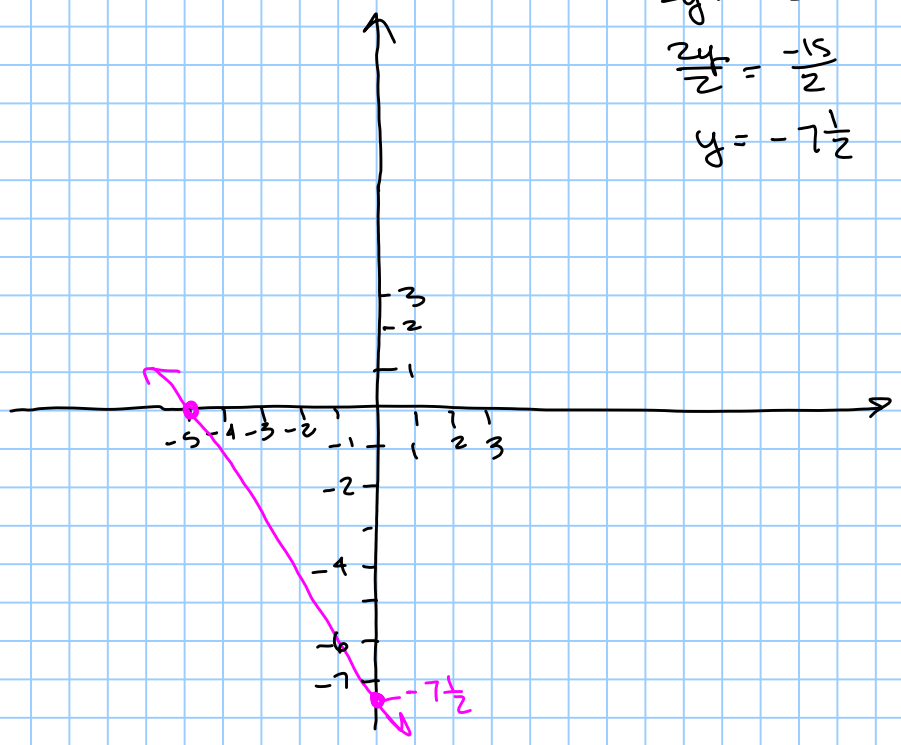
Find y-intercept: Set $x=0$: $3(0)+2y=-15$

$2y = -15$

$\frac{2y}{2} = \frac{-15}{2}$

$y = -7\frac{1}{2}$ pair: $(0, -7\frac{1}{2})$

y-intercept: $-7\frac{1}{2}$ or $(0, -7\frac{1}{2})$



3.4: Graphing Linear Equations Using Slope

Slope: measure of the "steepness" of a line

Definition: Slope $= m = \frac{y_2 - y_1}{x_2 - x_1}$, where (x_1, y_1) and (x_2, y_2) are points on the line.

$$\text{Slope} = \frac{\text{RISE}}{\text{RUN}} = \frac{\text{vertical change}}{\text{horizontal change}}$$

Ex: Find the slope of the line containing points $(1,4)$ and $(-2,7)$.

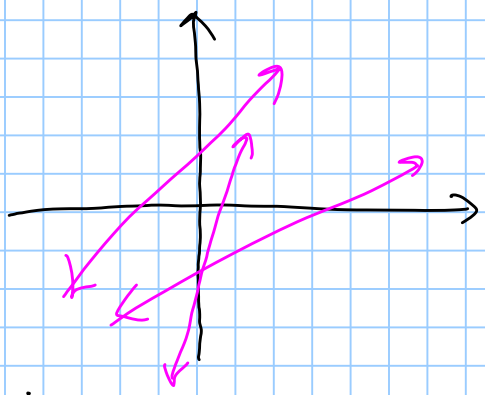
$(x_1, y_1) = (1,4)$

$(x_2, y_2) = (-2,7)$

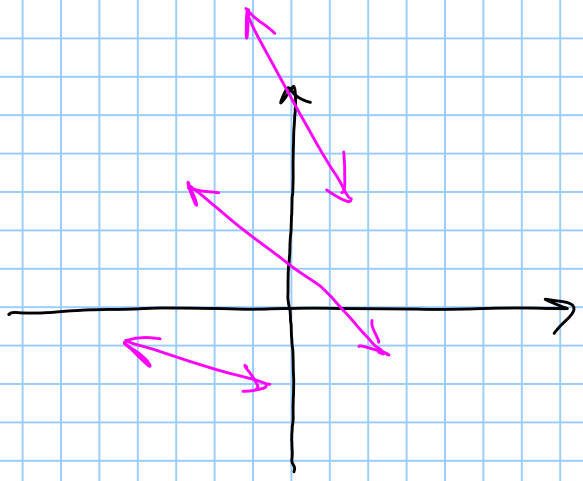
$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{7-4}{-2-1} = \frac{3}{-3} = -1$

Slope is -1.

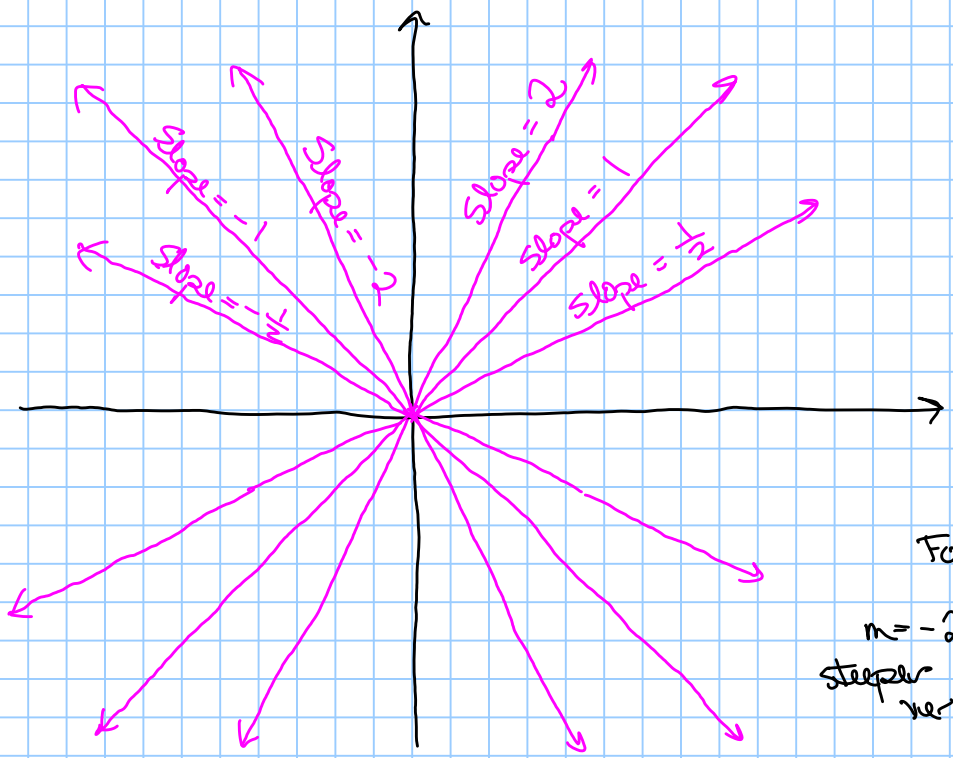
Positive and negative slopes



Positive Slopes
(go uphill from left to right)



Negative Slopes
(go downhill from left to right)



For positive slopes, a larger slope means the line is steeper (closer to vertical)

For negative slopes, $m = -2$ indicates a steeper line (closer to vertical) than $m = -1$.

Note: $-1 > -2$

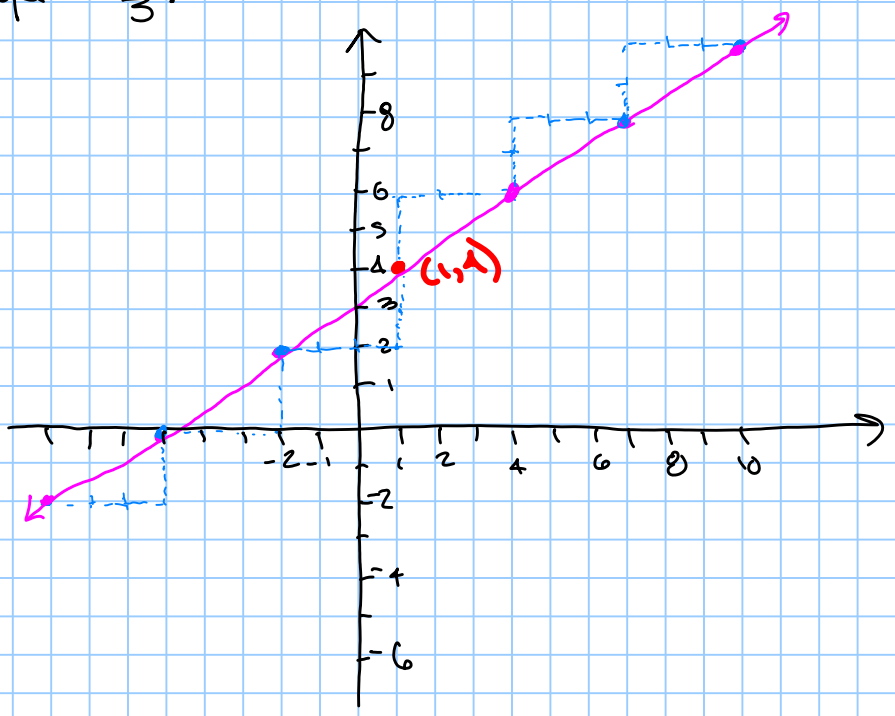
Ex: Graph the line that passes through $(1, 4)$ and has slope $\frac{2}{3}$.

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

Slope: ↗ (+)

$\frac{\text{RISE}}{\text{RUN}} = \frac{2}{3}$

vertical change: 2
horizontal change: 3



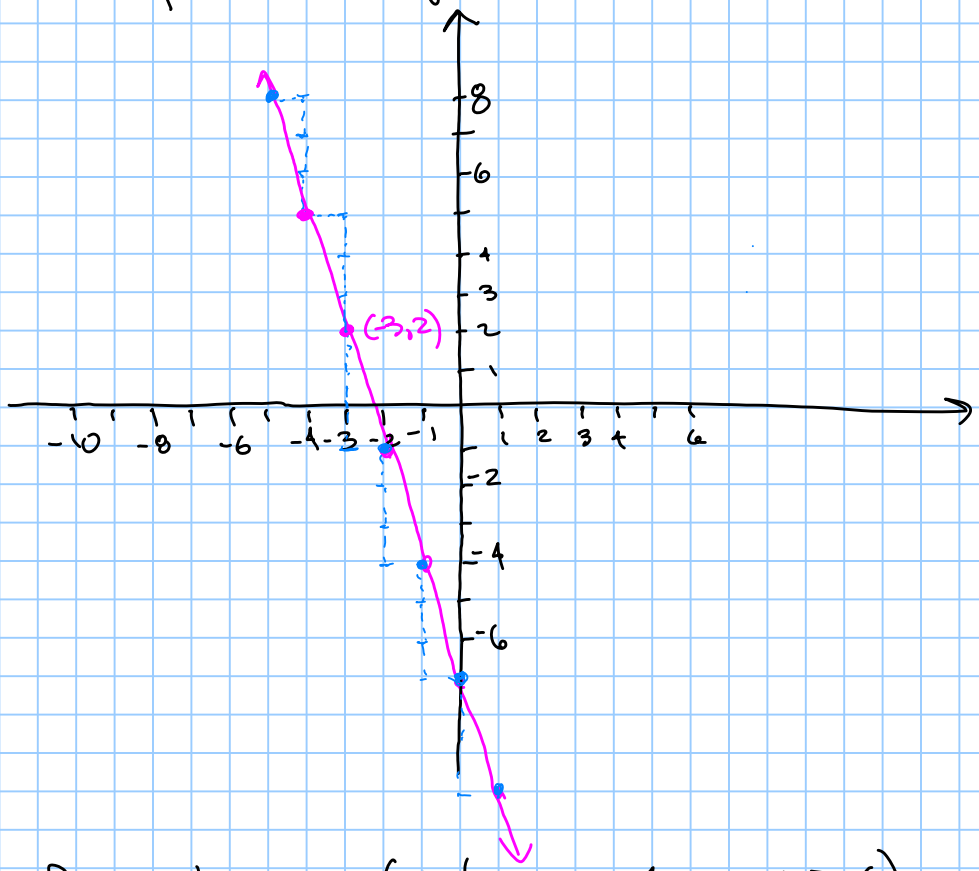
Ex: Graph the line that passes through $(-3, 2)$ and has slope -3.

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

Slope is neg, so ↘ (−)

$\frac{\text{RISE}}{\text{RUN}} = \frac{3}{1}$

vertical change: 3
horizontal change: 1



Slope-intercept Form of a Line (Sections 3.4 and 3.5)

$y = mx + b$, where m is the slope and b is the y-intercept.