

9/26

Ex. 3.5.79

$$x = 0$$

year = 2008

y = # of medical students (in thousands)

When year = 2018, $y = 574$ and in 2008 $y = 371$.

A. Make a linear equation

In 2008, $x = 0$ and so in 2018, $x = 10$

$(0, 371)$ $(10, 574)$

$$\frac{574 - 371}{10 - 0} = \frac{203}{10}$$

$(0, 371)$ is the y -intercept and $\frac{203}{10}$ is the slope
therefore, $y = \frac{203}{10}x + 371$

B. Find y if $x = 9$

$$y = \frac{203}{10}(9) + 371$$

$$y = 182.7 + 371$$

$$y = 553.7$$

~~Ex. 2~~

Vertical and Horizontal Lines

- horizontal lines have a slope of zero
- vertical lines have an undefined slope
- Equation of a horizontal line: $y = \text{constant}$
- Equation of a vertical line: $x = \text{constant}$

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B. Find y if $x = 4$

$$y = \frac{203}{10}(4) + 371$$

$$y = 182.8 + 371$$

$$y = 553.8$$

~~Ex. 2~~

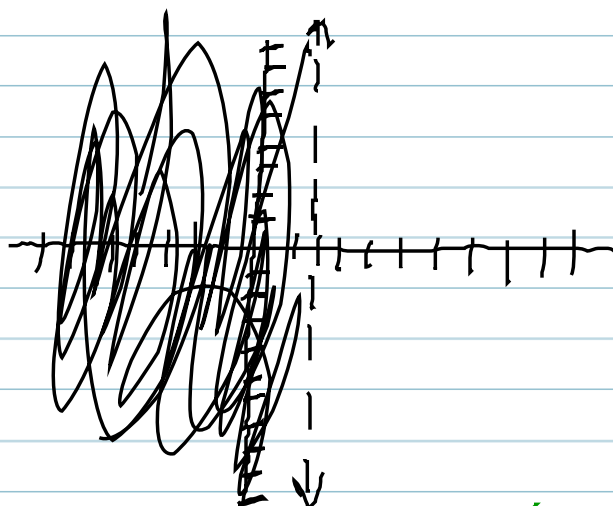
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Ex₃

(X) (O) 2

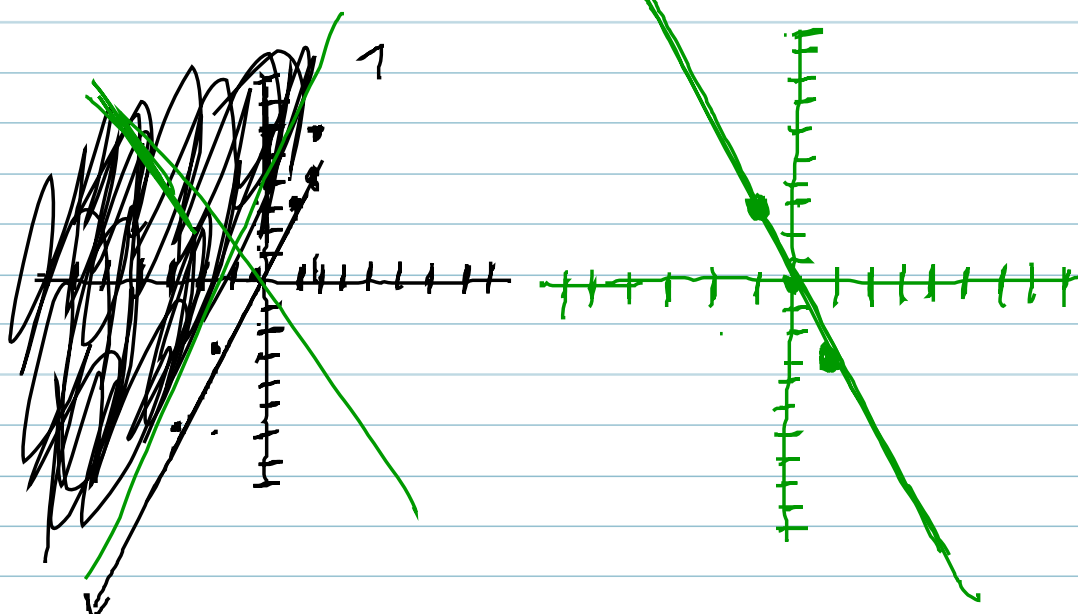
dashed
L & R



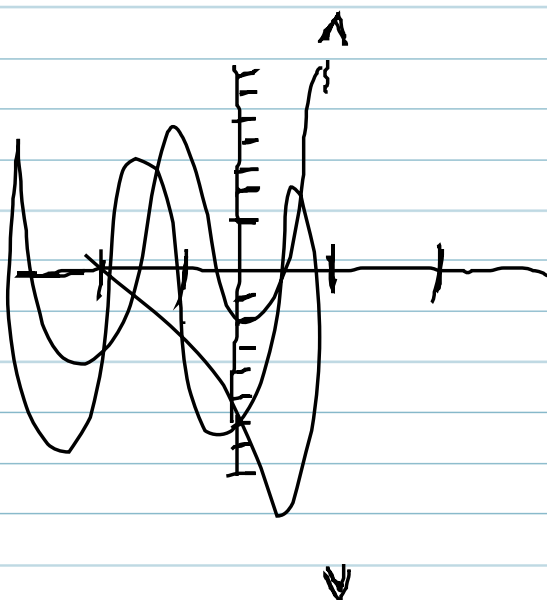
Ex₄

(X) (O) -3x

Solid
where



Ex₅



Finding the inequality
given the graph

1. determine the equation of
the graph, then solve for x

2. if shading is:
Left below $\rightarrow <$
Right above $\rightarrow >$

3. if line is:
dashed \rightarrow leave it be
solid \rightarrow \geq and \leq

- Extra Credit Workshop 4:30-5:30 @ 4-235

- 3.5

- 3.7

- 5 days till the Ch 3 test

- Study with the Ch 3 review problems

- Email assignments due Sunday

- 3.5: Graphing a line using slope and y-intercept

~~- To graph:~~

- To graph:

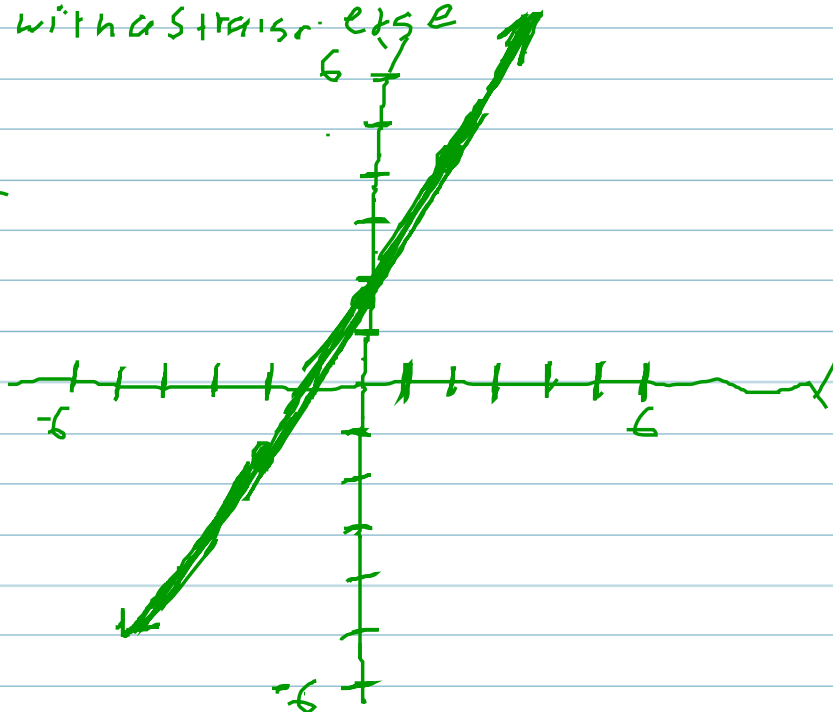
1. Plot y-intercept

2. Use the slope to plot the next point

3. Connect the points with a straight line

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

$$\begin{array}{r} 131 \quad 131 \\ \hline 2y = 3x + 3 \\ 2 \quad 2 \\ y = \frac{3}{2}x + \frac{3}{2} \end{array}$$



Slope-intercept form

- If you know y -intercept and slope, you can use the form $y = mx + b$ to make equation for a line

$$m = \text{slope}$$

$$b = y\text{-intercept}$$

Ex₇

$$\text{Slope} = \frac{3}{2} \quad y\text{-intercept} = (0, 0)$$

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

$$b = 0$$

$$y = m \times 1b$$

$$y = \frac{3}{2} \times 1b$$

$$\boxed{y = \frac{3}{2}x}$$

Point-Slope form

- If you have a point and a slope, you can find the formula of a line using the form:

$$y - y_1 = m(x - x_1)$$

$y_1 = y\text{-coordinate}$

$x_1 = x\text{-coordinate}$

Ex₉

$$\text{Slope} = \frac{5}{6} \quad \text{through } (-18, 6)$$

$$y - y_1 = m(x - x_1)$$

$$y - 6 = \frac{5}{6}(x + 18)$$

$$y - 6 = \frac{5}{6}x + 15$$

$$\begin{array}{r} +6 \qquad +6 \\ \hline y = \frac{5}{6}x + 21 \end{array}$$

$$\begin{array}{r} 5 \\ 6 \overline{) 30} \\ \underline{30} \\ 0 \end{array}$$

$$\begin{array}{r} 5 \\ 6 \overline{) 30} \\ \underline{30} \\ 0 \end{array}$$

* The point determines the form:

If the point is y -intercept, use Slope-intercept

non- y -intercept case, use Point-slope

Writing Straight Line Equations

- Sometimes slope is given and the line can't be found. Use the given line's slope ~~and~~ ^{to find} the line as well as a point to find the equation
- If the line can't be found, use the opposite reciprocal of the slope given and a point to find the equation

Ex: Point $(0, 2)$ Perpendicular to: $3/4 = x - 12$

$$\frac{3}{4} = \frac{x - 12}{4}$$

$$y = \frac{1}{3}x - 4$$

$$\frac{1}{3} \text{ opp. recip.} = -\frac{3}{1} = -3$$

$0, 2$ is an intercept, so:

$$y = -3x + 2$$