

Agenda -

Have handouts in a stack on your desk in this order.

1. Graphing Linear Equations homework
2. Writing Linear Equations Notes
(handout #1)
3. Board Races
- grab a dry erase board and a marker. Put these items under your desk.
4. Graphing equations **quiz**
5. Writing Linear Equations Notes - part 2
(handout #2)
6. Ticket out the door
(handout #3)

HW: Equations of Lines WS

BELLWORK

Respond to the following prompt in the bellwork section of your notebook.

"Explain how you can use an equation to graph a line."

Give an example.

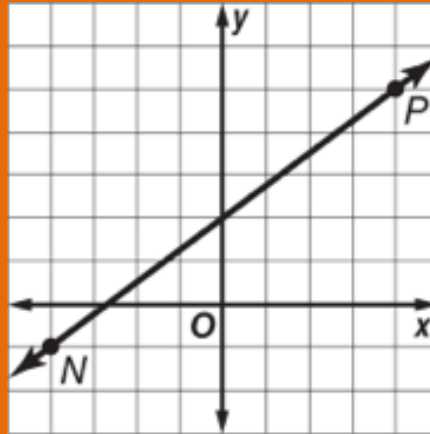
**You may also want your notes from Tuesday readily available...*

PAIR up with someone who has the same first, middle, or last initial as you.

Once you've partnered up, **SHARE** what you wrote for your bellwork with each other.

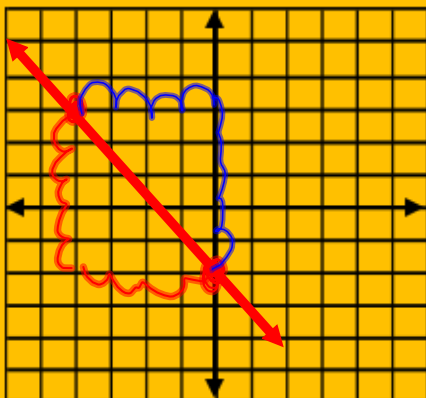
When you've finished sharing, promptly go back to your seat.

Using what we learned yesterday about slope-intercept form of an equation, how could you write the equation of the line shown in the graph below? Discuss within your group.



Examples:

Write the equation of the line in slope-intercept form given a graph.



$$y = mx + b$$

$$m = \frac{5}{-4}$$

$$b = -2$$

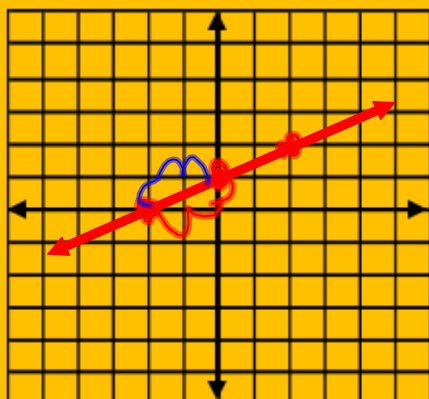
$$\frac{-5}{4}$$

$$y = -\frac{5}{4}x + -2$$

$$y = \frac{-5}{4}x - 2$$

Examples:

Write the equation of the line in slope-intercept form given a graph.



$$y = mx + b \rightarrow y = \frac{1}{2}x + 1$$

$$m = \frac{+1}{+2}$$

$$b = +1$$

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

Examples:

Write the equation of the line in slope-intercept form given the slope and the y-intercept.

1. $(0, 2)$ $m = \frac{2}{3}$

$$y = mx + b$$

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

2. $(0, 0)$ $m = -2$

$$y = -2x + 0$$

$$y = -2x$$

Examples:

Write the equation of the line in slope-intercept form given the slope and the y-intercept.

3. $(0, 10)$ $m = 0$ $y =$

↑
horizontal line

4. $(2, 0)$ $m = \text{undefined}$

BOARD RACES!

Directions: Write an equation in slope-intercept form given the information on each screen. When you have your equation written down, flip your board over and wait patiently.

Expectations: You are expected to participate by completing each problem as best you can. Allow all students the chance to answer the question.

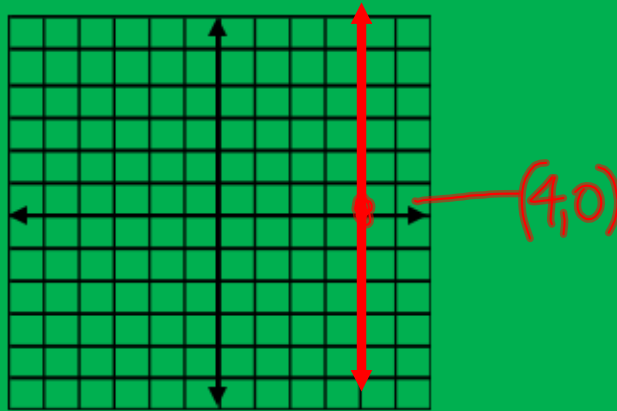
PROBLEM 1

$$(0, -5) \quad m = \frac{-1}{3}$$

PROBLEM 2

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

PROBLEM 3



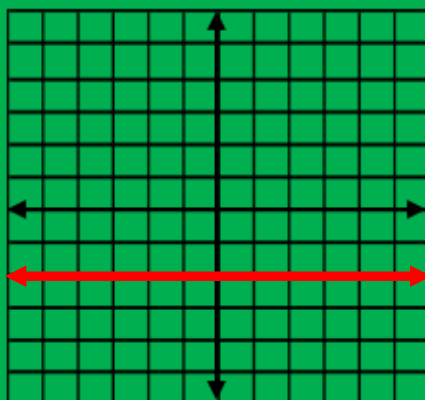
PROBLEM 4

$$(0, 1) \quad m = \frac{5}{2}$$

PROBLEM 5

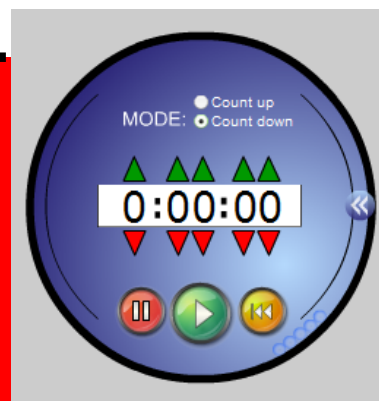
$(4, -3)$ $m = \text{undefined}$

PROBLEM 6



GRAPHING EQUATIONS QUIZ

1. When you finish, turn your quiz into the "slot" for second hour (not the folders).
2. If you finish early, return to your seat and proceed to work on the homework, doing the problems covering what we just learned.



WHAT IF WE DON'T KNOW THE Y-INTERCEPT?

Please put the "Notes Part 2" handout at the top of your stack.

To write an equation, you must know at least one **point on the line**, and the **slope**. There are two methods that can be used to write the equation.

Slope-intercept form

$$y = mx + b$$

↑ ↑

plug in coordinates
of that point

Point-slope form

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

↑ ↑

plug in coordinates
of the given
point

Read the directions to yourself for writing the equation of a line using slope-intercept form.

Example 1: pt. (2, -4), $m = \frac{1}{2}$

1. Identify/find the slope.

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

2. Plug in for x and y using given point.

$$y = mx + b$$

$$-4 = \left(\frac{1}{2}\right)(2) + b$$

$$-4 = 1 + b$$

$$b = -5$$

4. Write the equation in slope-intercept form.

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

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

Now read the directions for writing the equation of a line using point-slope form.

Example 1: pt. (2, -4), $m = \frac{1}{2}$

1. Identify/find the slope.
2. Plug in for x and y using given point.
3. Solve for y.

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

$$y - (-4) = \frac{1}{2}(x - 2)$$

$$y + 4 = \frac{1}{2}x - 1$$

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

Example 2: pt. (3, 0), $m = -2$

$$y = mx + b$$

$$0 = -2(3) + b$$

$$0 = -6 + b$$

$$b = 6$$

$$y = -2x + 6$$

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

$$y - 0 = -2(x - 3)$$

$$y = -2x + 6$$

Example 3: $(-2, -2)$ and $(4, 2)$

* FIND THE SLOPE!!

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

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

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

$$y - 2 = \frac{2}{3}x - \frac{8}{3}$$

$$y = \frac{2}{3}x - \frac{8}{3} + 2$$

$$y = \frac{2}{3}x - \frac{8}{3} + \frac{6}{3}$$

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

Partner Play

Directions: You and your partner will both write an equation given two points. Select whichever method you prefer. After you complete your problem, compare your results, and discuss how you used your method. Consider things you may have done the same, things you may have done differently.

