

BLC150–Algebra Workshop

Homework 8- Linear Equations and Graphs

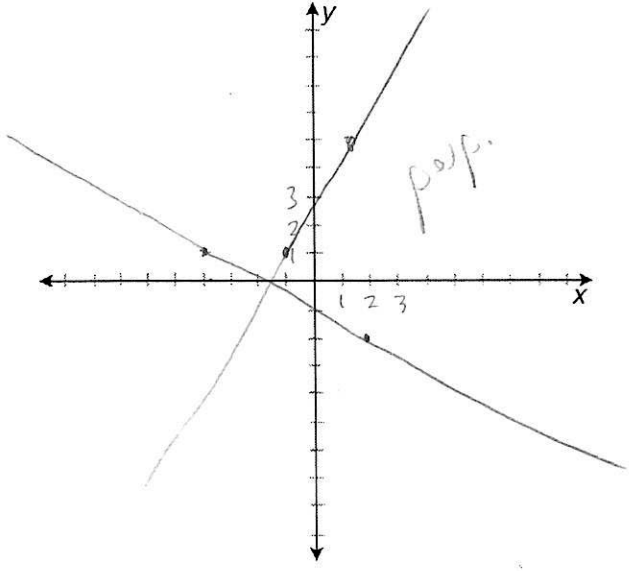
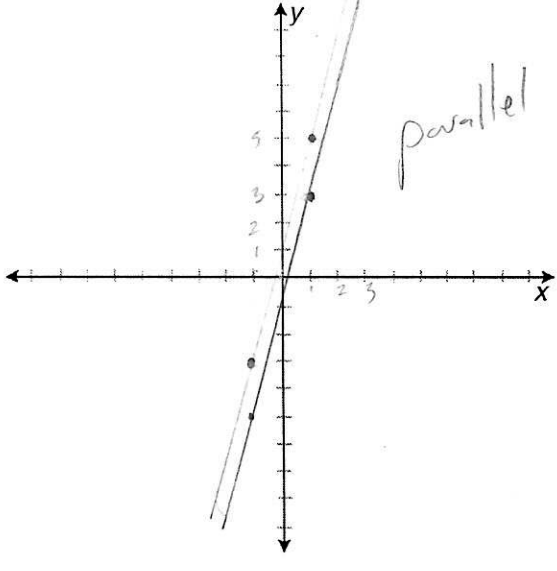
Name: *Me*

$$y = mx + b,$$

$m = \text{slope} = \frac{\text{rise}}{\text{run}} = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{y_1 - y_2}{x_1 - x_2}$. The input data is from two points, (x_1, y_1) and (x_2, y_2) .

$b = y_{\text{intercept}}$ which means where the line crosses the y-axis. It is the point $(0, y)$.

Given 2 points, determine the slope, m . I did #1 to get you started.

| | | | |
|---|---|--|---|
| <p>1. $(-1, 1)$ and $(1, 5)$</p> $m = \frac{5 - 1}{1 - (-1)} = \frac{4}{2} = 2$ <p style="text-align: center;">or</p> $m = \frac{1 - 5}{-1 - 1} = \frac{-4}{-2} = 2$ | <p>2. $(2, -2)$ and $(-4, 1)$</p> $m = \frac{-2 - 1}{2 - (-4)} = \frac{-3}{6} = -\frac{1}{2}$ <p style="text-align: center;">or</p> $m = \frac{1 - (-2)}{-4 - 2} = \frac{3}{-6} = -\frac{1}{2}$ | <p>3. $(1, 5)$ and $(-1, -3)$</p> $m = \frac{5 - (-3)}{1 - (-1)} = \frac{8}{2} = 4$ <p style="text-align: center;">or</p> $m = \frac{-3 - 5}{-1 - 1} = \frac{-8}{-2} = 4$ | <p>4. $(1, 3)$ and $(-1, -5)$</p> $m = \frac{3 - (-5)}{1 - (-1)} = \frac{8}{2} = 4$ <p style="text-align: center;">or</p> $m = \frac{-5 - 3}{-1 - 1} = \frac{-8}{-2} = 4$ |
| <p>5. Graph the line connecting the points for problems 1 and 2. Make sure the slope you found makes sense with your graph.</p>  | | <p>6. Graph the line connecting the points for problems 3 and 4. Make sure the slope you found makes sense with your graph.</p>  | |

| | prose | symbolic | Example 1 | Example 2 |
|-----------------------|---|------------------------|-----------------------------|----------------------------------|
| Perpendicular slopes: | m is perpendicular to any line with a slope of $\frac{-1}{m}$ | $m \perp \frac{-1}{m}$ | $4 \perp \frac{-1}{4}$ | $\frac{2}{3} \perp \frac{-3}{2}$ |
| Parallel slopes: | m is parallel to any line with a slope of m . | $m \parallel m$ | $\frac{3}{1} = \frac{6}{2}$ | $-5 = -5$ |

Fill in the missing numbers in the ordered pairs and identify the slope, m , and the $y_{intercept}$ b .

7. $y = 2x + 3$
 $(0, 3)$ $(-\frac{3}{2}, 0)$

$(1, 5)$ $(-1, 1)$

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

$b = 3$

8. $y = -\frac{1}{2}(x) - 1$
 $(0, -1)$ $(-2, 0)$

$(2, -2)$ $(4, -3)$

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

$b = -1$

9. $y = 4x + 1$
 $(0, 1)$ $(-\frac{1}{4}, 0)$

$(1, 5)$ $(-1, -3)$

$m = 4$

$b = 1$

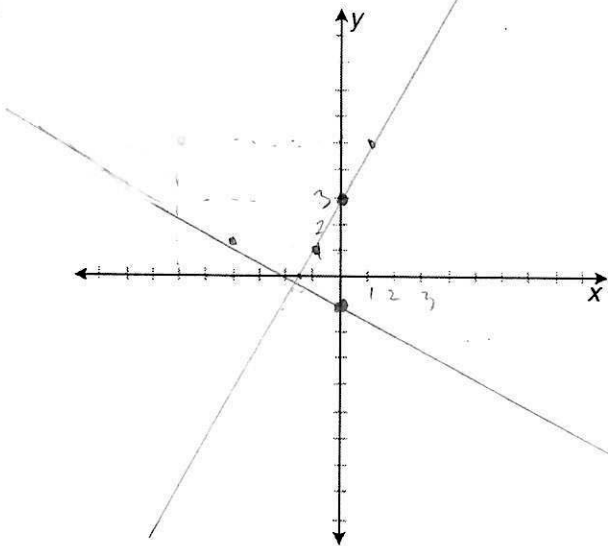
10. $y = 4x - 1$
 $(0, -1)$ $(\frac{1}{4}, 0)$

$(1, 3)$ $(\frac{3}{2}, 5)$

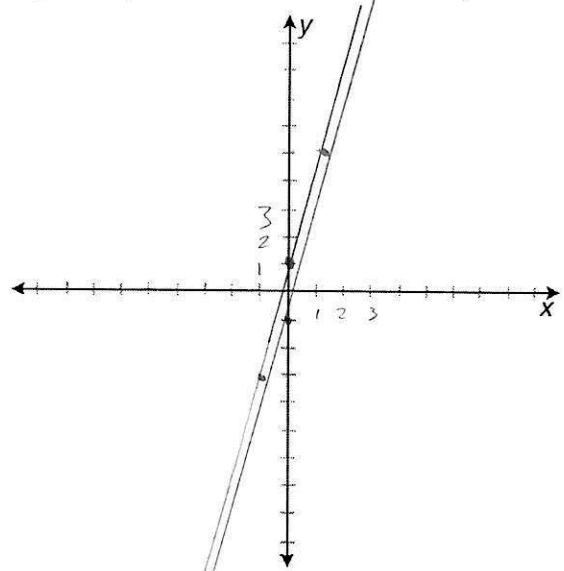
$m = 4$

$b = -1$

11. Graph 7 and 8 below. Make sure that all of the points and slopes that you determined live on their respective lines.



11. Graph 9 and 10 below. Make sure that all of the points and slopes that you determined live on their respective lines.



12a. Find the slope, m , for $(3, 1)$ and $(-3, 1)$ and graph the line that connects them on the blank graph to the right.

$m = \frac{1-1}{6} = \frac{0}{6}$

12b. What is the $y_{intercept}$ b , of this line? Is there an $x_{intercept}$?

$b = 1$

$\{y = 1\}$

13a. What is the slope between $(3, 3)$ and $(3, -2)$?

$m = \frac{3-2}{0} = \text{und} \rightarrow \text{vertical}$

13b. Is there a $y_{intercept}$ or $x_{intercept}$? If so, what is it?

none

$\rightarrow x = 3$

