Notes:

Linear Equations

Created for you by Ms. Nhotsouvanh

Steps to Graphing a Linear Equation:

1. Substitute each x-value into the equation
2. Solve for y
3. Write the ordered pair
4. Plot each point
5. Construct the line (arrows on each end)
6. Label the line with the equation

Example 1:

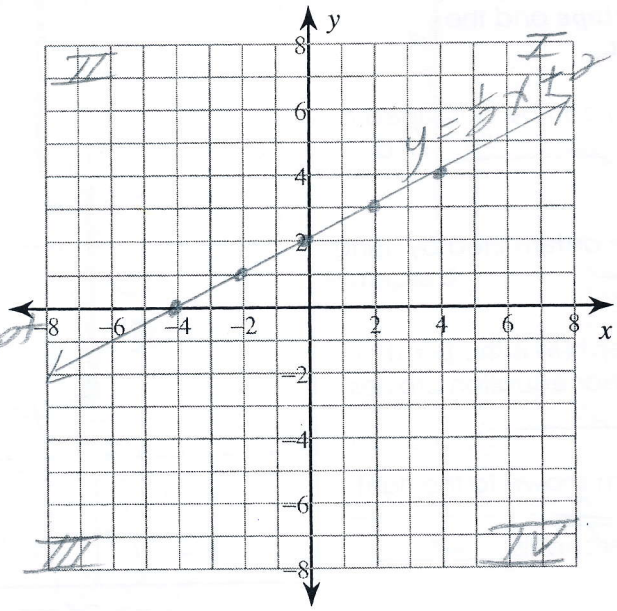
Input (x)	$y = \frac{1}{2}x + 2$	*Output (y)*	*(x, y)*
−4	$\frac{1}{2}(-4)+2$	0	(−4, 0)
−2	$\frac{1}{2}(-2)+2$	1	(−2, 1)
0	$\frac{1}{2}(0)+2$	2	(0, 2)
2	$\frac{1}{2}(2)+2$	3	(2, 3)
4	$\frac{1}{2}(4)+2$	4	(4, 4)

$m = \frac{rise}{run}$

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

$b = 2$

y-intercept



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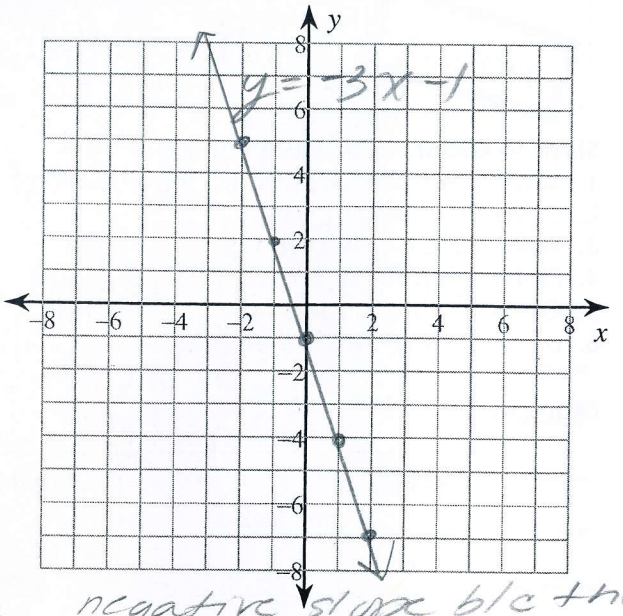
Example 2: Use the linear equation $y = -3x - 1$ to complete the table below.

$y = -3x - 1$

Input (x)	Output (y)
−2	5
−1	2
0	−1
2	−7



$m = \frac{-3}{1} \frac{rise}{run}$

$b = -1$

negative slope b/c the line is decreasing.

Writing a Linear Equation from a Graph

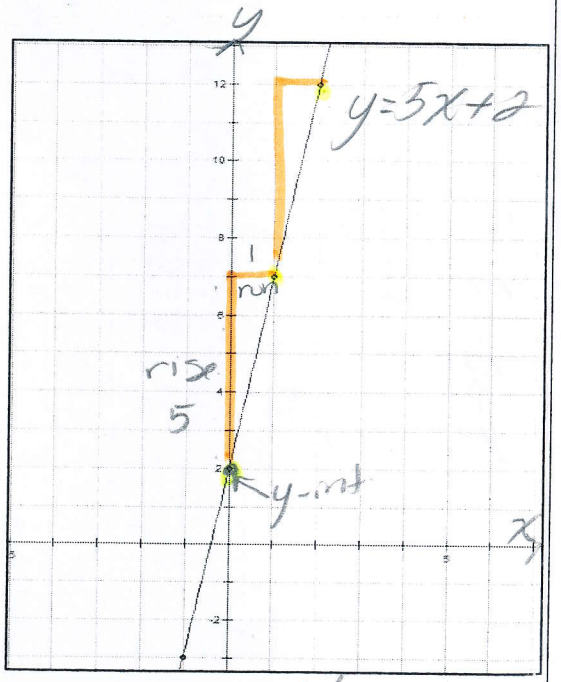
In each linear equation, we can identify the ***slope*** and the ***y − intercept***.

The slope (m) can be described as the steepness of a line.

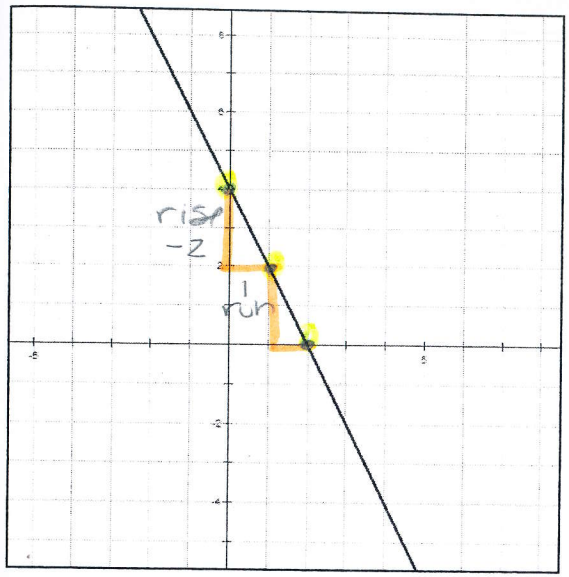
Slope can be determined by using the ratio $\frac{rise}{run}$

The y−intercept (b) is the point where the linear equation crosses the y-axis.

In the diagram shown to the right, the slope is $\frac{5}{1}$ and the y-intercept is 2.



equation $y = mx + b$ → $y = 5x + 2$



Example 3:

Slope Type: negative

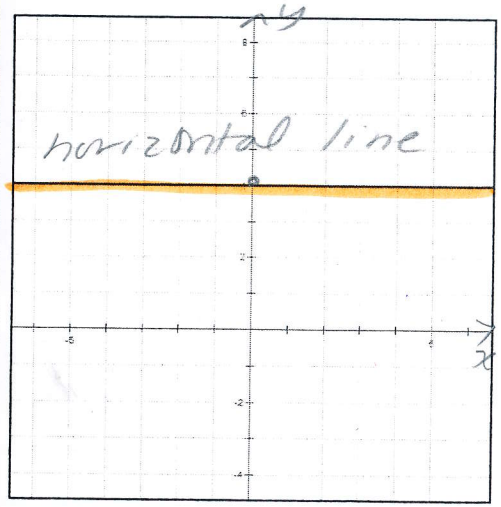
Slope (m) = $\frac{-2}{1}$

y-intercept (b) = 4

Linear Equation:

$y = -2x + 4$

$y = mx + b$



Example 4:

Slope Type: no slope

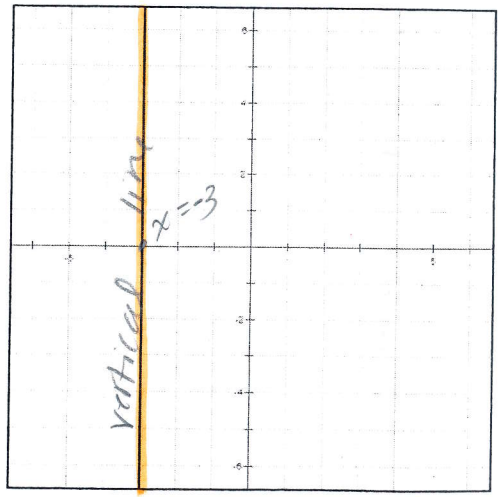
Slope (m) = 0

y-intercept (b) = 4

Linear Equation: $y = mx + b$

$y = 0x + 4$

$y = 4$



Example 5:

Slope Type: no slope or undefined slope

Linear Equation:

$x = -3$