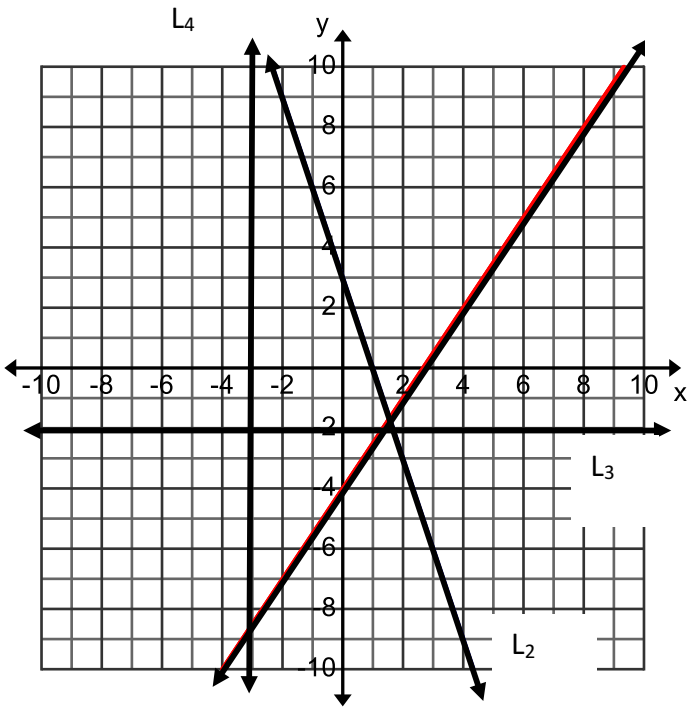
U6D1 Analytic Geometry Part 2

Equation of a Line in Slope Y-Intercept Form

Example 1: Determine the slope and y-intercept of each line. Then determine the equation of each linear relation.



L_1:

L_2:

L_3:

L_4:

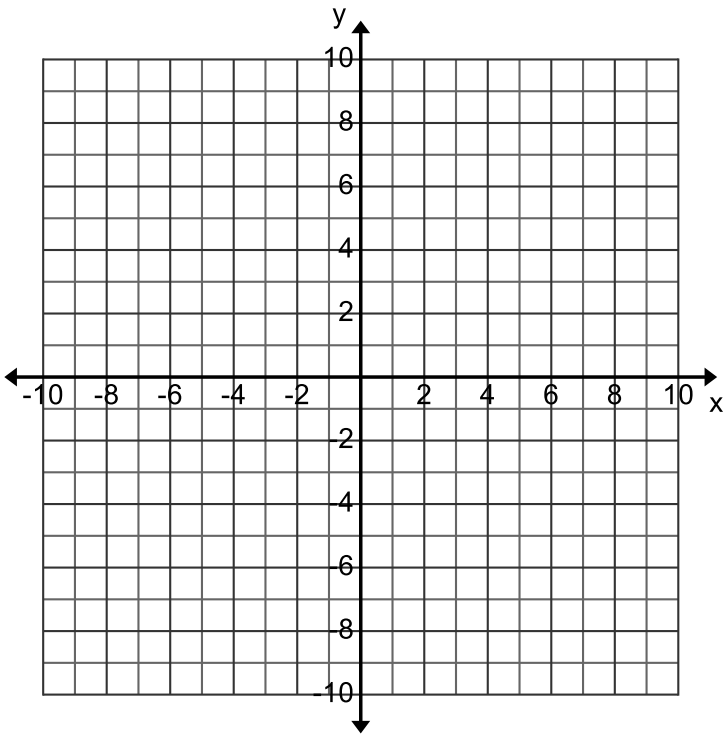
Example 2: Given the slope and y-intercept, write an equation of the linear relation and then graph the line.

To graph a line given slope and y-intercept:

Step 1: Plot the _____. (,)

Step 2:

Use the _____ value to determine the _____ and _____ from the y-intercept.



a. $m = \frac{2}{5}, b = -5$

b. $m = -2, b = 1$

c. $m = -\frac{1}{3}, b = 0$

d. $m = 5, b = 2$

Therefore the equation of a line can be written in slope y-intercept form

$$y = mx + b$$

where m is the slope and b in the y-intercept.

Special Cases:

A. Horizontal Lines

- The slope of a horizontal line is **_____.**
- Putting that slope into the equation $y = mx + b$, we get $y = 0x + b$

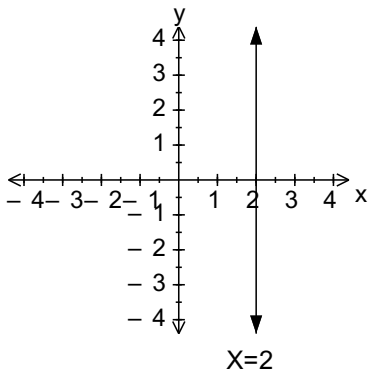
$\therefore$ is the equation of a horizontal line.

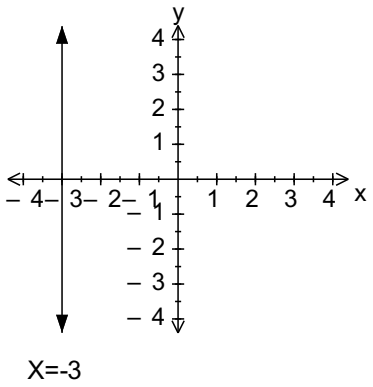
B. Vertical Lines

- The slope of a vertical line does not exist. We call this _____.

$\therefore$ We cannot use slope y-intercept form for vertical lines.

- Vertical lines are written in the form of , where 'a' is the x-intercept.





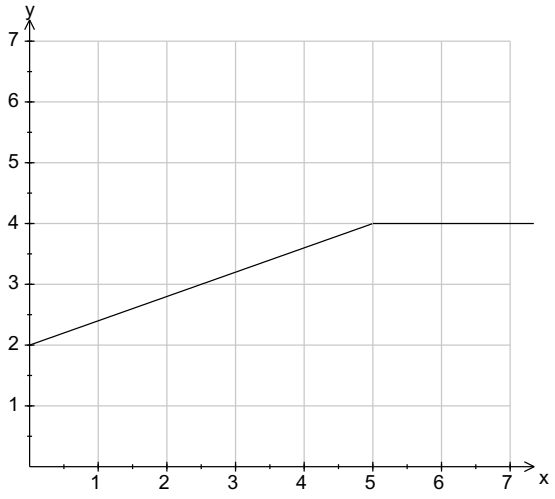
Example 3 (interpreting graphs): The distance time graph of a person walking in front of a motion sensor is shown below.

a. How far from the sensor did the person start walking?

b. How fast did the person walk?

c. Did the person walk away or towards the sensor?

d. What is happening after 5 seconds?



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