January 04, 2016

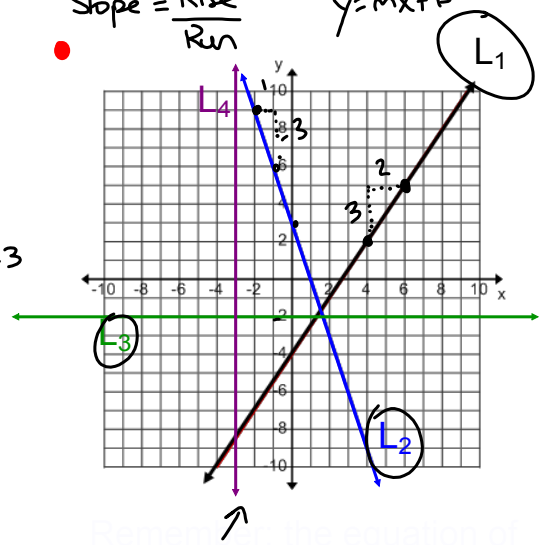
# MPM 1DI - Unit 5
# Linear Relations

## Day 1 - Equation of a Line
## Slope - Y intercept Form

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

Slope = Rise / Run

y = mx + b




L1: m = $\frac{3}{2}$ (Slope)

b = $-4$

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

L2: m = $\frac{-3}{1} = -3$

b = $3$

y = $-3x + 3$

L3: m = $0$

b = $-2$

y = ~~$0x$~~ $-2$ $y = -2$

L4: m = Undefined

b = Does not exist

~~y =~~ $x = -3$

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

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

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

b. m = -2, b = 1

$y = -2x + 1$

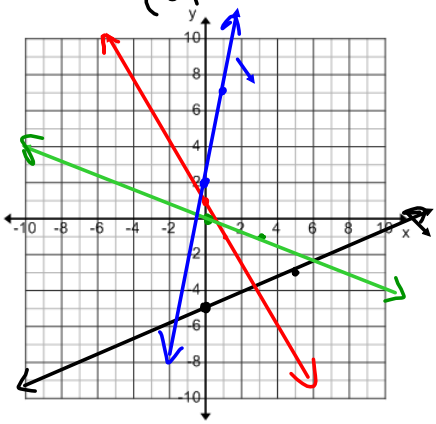
c) $m = -\frac{1}{3},\ b = 0$

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

d. m = 5, b = 2

$y = 5x + 2$

(x, y)
(0, -5)



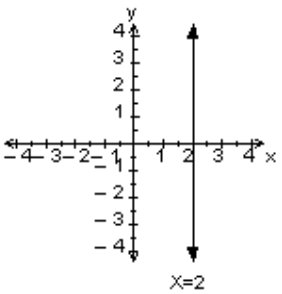
**Special Cases:**

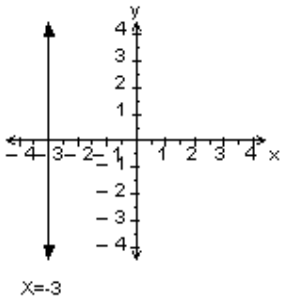
A. Horizontal Lines

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

B. Vertical Lines

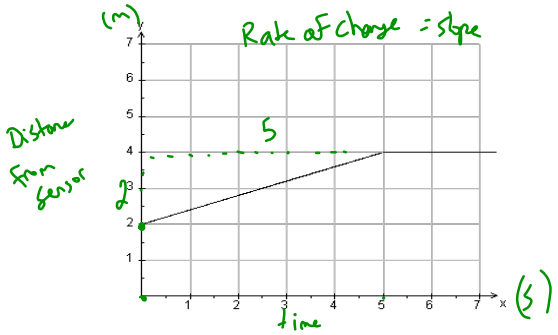
- The slope of a vertical line does not exist.
  We call this **undefined**.
  ∴we cannot use slope y-intercept form for vertical lines.
- Vertical lines are written in the form of , x = a,
  where a is the x-intercept.



**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? 2 meters →

b. How fast did the person walk?

Rate of change is $\frac{2}{5}$

walks 2 meters every 5 seconds → 0.4m/second

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

d. What is happening after 5 seconds?

standing still

# Assigned Work

Pg 304-306 # 1, 2, 3, 4, 6(ace), 7(ab), 8, 9, 12