

## Algebra 1 Lesson 5.1 Writing Linear Equations in Slope-Intercept Form

### Objectives:

- Write an equation in slope-intercept form, given the slope and y-intercept of a line.
- Use the graph of a line to write an equation in slope-intercept form.
- Write the equation of a linear model (real-life application) in slope-intercept form.

Name: **KEY**

### 5.1 Writing Equations in Slope-Intercept Form (given the slope and y-intercept)

The equation of a line written in slope intercept form is:  $y = mx + b$ ,  
where  $m$  is the slope and  $b$  is the y-intercept.

**Practice 1:** Write an equation in slope-intercept form given the slope and y-intercept.

a) y-intercept = -5; slope = 2

b)  $m = \frac{2}{3}$  and  $b = 4$

$$y = 2x - 5$$

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

c) y-intercept = 3; slope = zero

HORIZONTAL

$$y = 3$$

d)  $m = 1$  and  $b = 0$

$$y = x$$

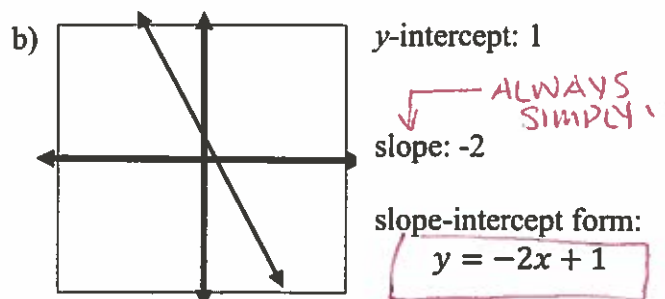
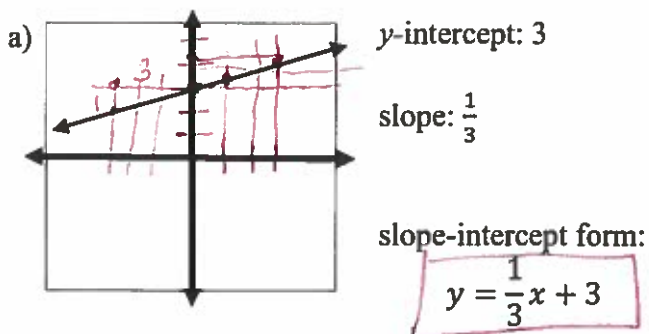
$y = 1x + 0$   
 $y = x$  IS NOT SIMPLIFIED

\*MAKE SURE ITS SIMPLIFIED.

### 5.1 Writing Equations in Slope-Intercept Form (given a graph)

When given the graph of a line you must identify the slope and the y-intercept before you can write the equation.

**Practice 2:** Identify the y-intercept, slope, and write in slope-intercept form.

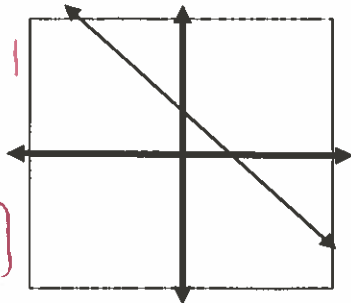


**Practice 3: Write the equation of each graph slope-intercept form.**

**\*\*Special Cases\*\***

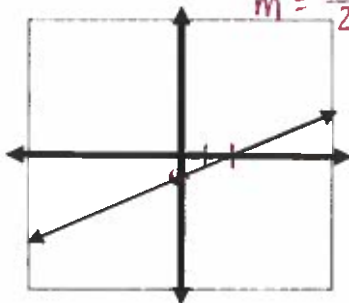
a)  $y = -x + 2$

$b = 2$   
 $m = \frac{-1}{1} = -1$   
 SIMPLY  
 $y = -1x + 2$   
 $y = -x + 2$



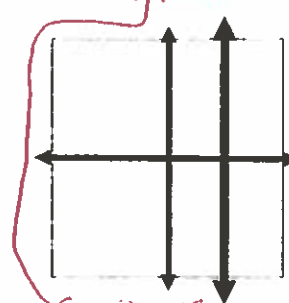
b)  $y = \frac{1}{2}x - 1$

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



c)  $x = 3$

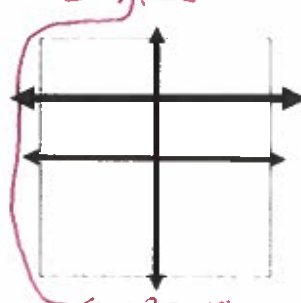
VIX



SCOPE IS UNDEFINED

d)  $y = 3$

HCOY



SCOPE IS ZERO

**Linear Models: Modeling Real-World Situations**

We can use the equation  $y = mx + b$  to model real-world situations. The value of  $m$  is the "rate of change" ('fancy' for slope) and the value of  $b$  is the starting value (constant/y-intercept).

↓  
 SLOPE

**Practice 4: Write the linear equation that models the relationship in the following example.**

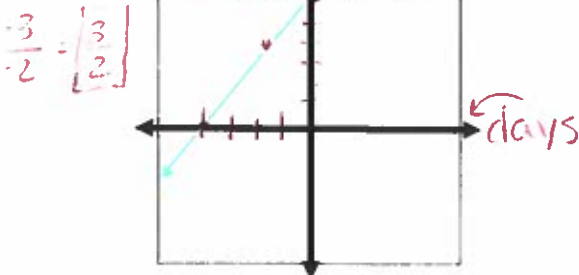
The cost of renting a car includes a \$6.00 rental fee plus \$1.50 per day rental charge. Write a linear equation which models the cost ( $c$ ) of renting a car for  $d$  days.

a) What is the constant?  $6$

b) What is the rate of change (written as a fraction)?  $\frac{3}{2}$

c) Write the linear equation that describes it using  $c$  and  $d$  as the variables:  $c = \frac{3}{2}d + 6$

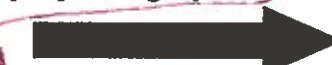
d) Graph the linear equation:



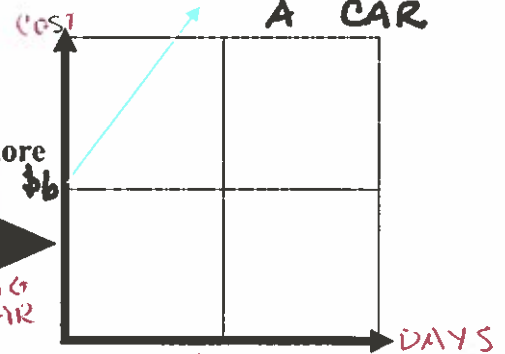
$c = \text{COST}$   
 $d = \text{DAYS}$

COST FOR RENTING A CAR

Why would this be a more appropriate graph??



YOU'RE NOT GOING TO HAVE A CAR FOR NEGATIVE DAYS OR NEGATIVE COSTS



**Follow-up Questions:**

How much would it cost to rent a car for five days?  $c = \frac{3}{2}(5) + 6 = \$13.50$

How much would it cost to rent a car for seven days?  $c = \frac{3}{2}(7) + 6 = \$16.50$