HAPPY INTERNATIONAL DAY AGAINST HOMOPHOBIA AND TRANSPHOBIA! :)

MAY 17, 2017

UNIT 3: LINEAR RELATIONS AND FUNCTIONS

SECTION 6.4: SLOPE-INTERCEPT FORM OF THE EQUATION FOR A LINEAR FUNCTION

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NUMBERS, RELATIONS AND FUNCTIONS 10

WHAT'S THE POINT OF TODAY'S LESSON?

We will begin working on the NRF 10 Specific Curriculum Outcomes (SCOs) "Relations and Functions 6 and 7" OR "RF6 and RF7" which state:

RF6: "Relate linear functions expressed in: slope-intercept form ($y = mx + b$), general form ($Ax + By + C = 0$) and slope-point form [$y - y_1 = m(x - x_1)$]"

AND

RF7: "Determine the equation of a linear relation given: a graph, a point and the slope, two points, a point and the equation of a parallel or perpendicular line or a scatter plot."

What does THAT mean???

SCO RF6 means that we will:

* **express a linear relation in slope-intercept, general and slope-point forms and compare the graphs**
* **generalize and explain strategies for graphing a linear relation in slope-intercept, general or slope-point form**
* **graph a linear relation given in slope-intercept, general or slope-point form**
* **identify equivalent linear relations from a set of linear relations**
* **match a set of linear relations to their graphs**

What does THAT mean???

SCO RF7 means that we will:

* **determine the slope and y-intercept of a given linear relation from its graph and write the equation in the form y = mx + b**
* **write the equation of a linear relation given its slope and the coordinates of a point on the line and explain the reasoning**
* **write the equation of a linear relation given the coordinates of two points on the line and explain the reasoning**
* **write the equation of a linear relation given the coordinates of a point on the line and the equation of a parallel or perpendicular line and explain the reasoning**
* **graph linear data generated from a context and write the equation of the resulting line**
* **solve a contextual problem using the equation of a linear relation**

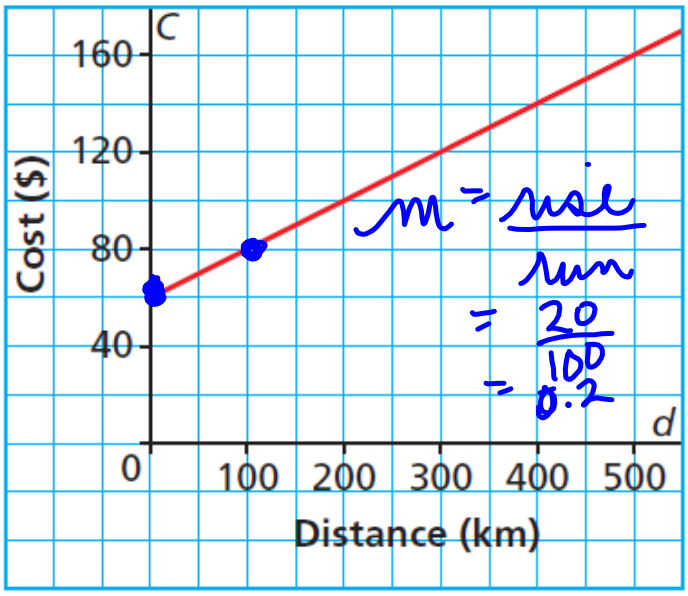
HOMEWORK QUESTIONS?

(page 310, #16 & #17 ;
pages 319/ 320 / 321 / 322, #4 TO #13 & #16)

In Chapter 5, Lesson 5.6, we described a linear function in different ways. The linear function below represents the cost of a car rental.

$y = mx + b$

Car Rental Costs



An equation of the function is:
$C = 0.20d + 60$

$$C = 0.20d + 60$$

The number, 0.20, is the rate of change, or the slope of the graph. This is the cost in dollars for each additional 1 km driven.

The number, 60, is the vertical intercept of the graph. This is the cost in dollars that is independent of the distance driven – the initial cost for renting the car.

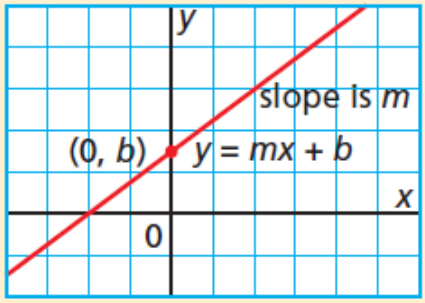
In general, any linear function can be described in **slope-intercept form.**

$y = mx + b$

slope y-int.

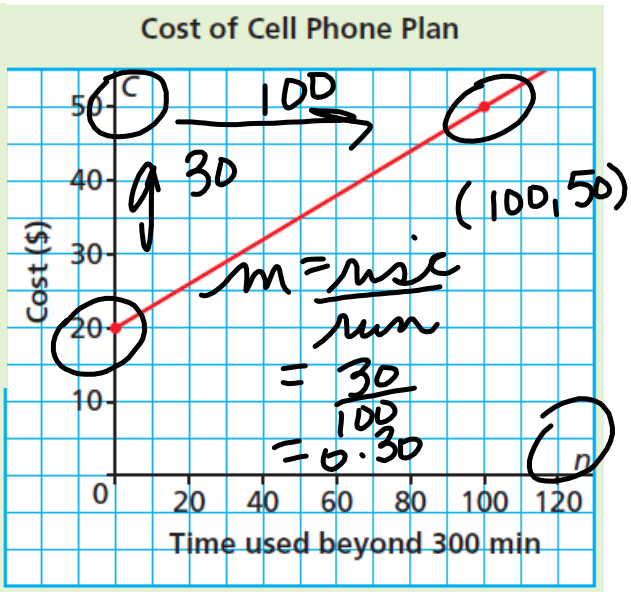
Slope-Intercept Form of the Equation of a Linear Function

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



YOU TRY!

A cell phone plan charges a monthly fee that covers the costs of the first 300 min of phone use. This graph represents the cost of the plan based on the time beyond 300 min.



$y = mx + b$

$C = 0.30n + 20$

Write an equation to describe this function. Verify that your equation is correct.

SOLUTION: **C = 0.30n + 20**

VERIFICATION: **C = 0.30n + 20**
50= 0.30 (100) + 20
50= 30 + 20
50= 50

EXAMPLE:

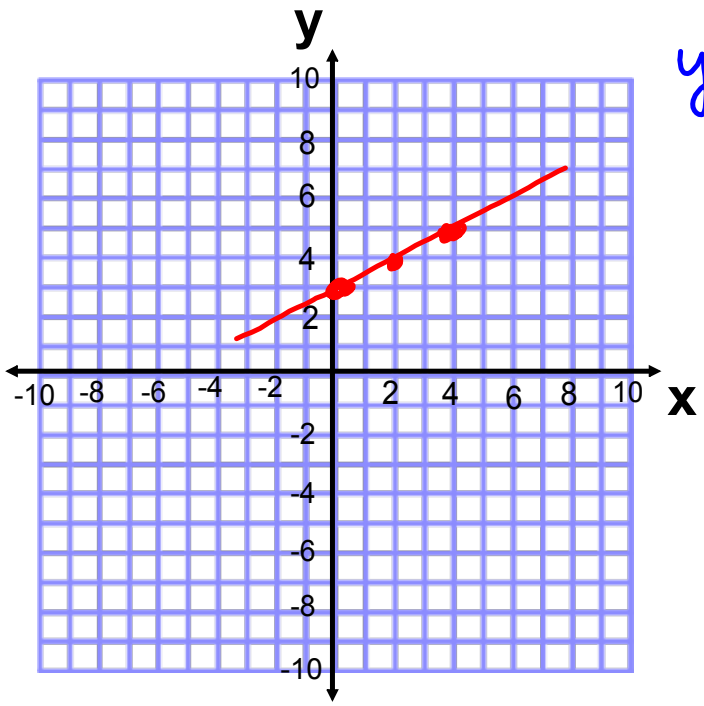
The graph of a linear function has slope $\frac{3}{5}$ and y-intercept -4. Write an equation for this function.

An equation for this function is: $y = \frac{3}{5}x - 4$

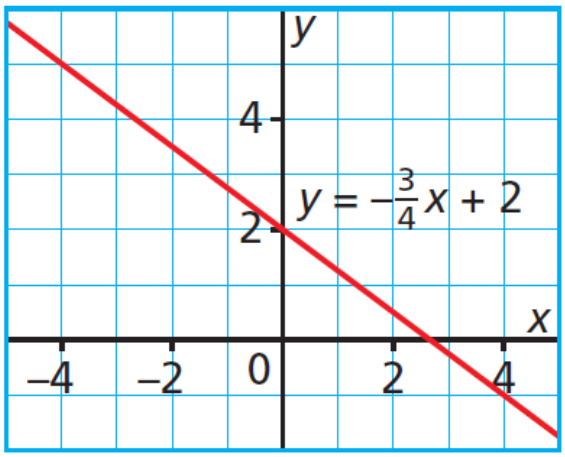
EXAMPLE:

Graph the linear function with equation: $y = \frac{1}{2}x + 3$

$y = mx + b$



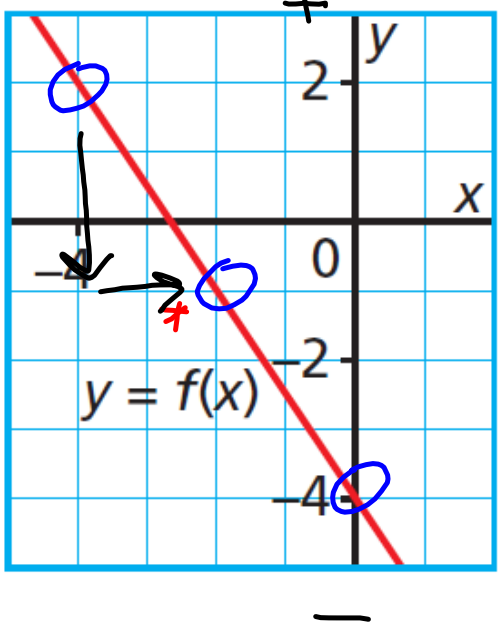
YOU TRY! Graph the linear function with equation: $y = -\frac{3}{4}x + 2$



EXAMPLE:

Write an equation to describe this function.

Verify the equation.



$$y = -\frac{3}{2}x - 4$$ ✓

VERIFICATION [using point (-2 , -1)]

x, y

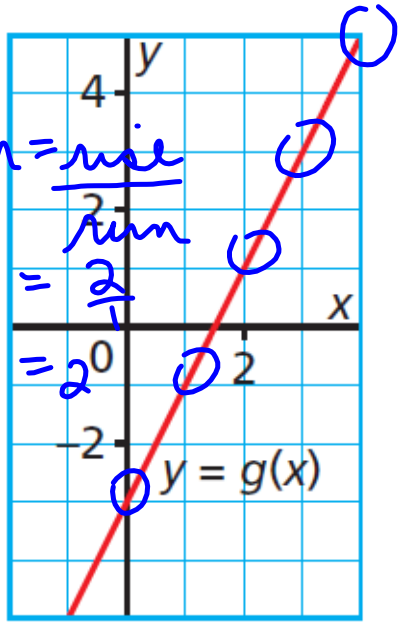
$$y = -\frac{3}{2}x - 4$$

$$-1 = -\frac{3}{2}(-2) - 4$$

$$-1 = 3 - 4$$

$$-1 = -1$$

YOU TRY! Write an equation to describe this function. Verify the equation.



[Answer: $y = 2x - 3$]

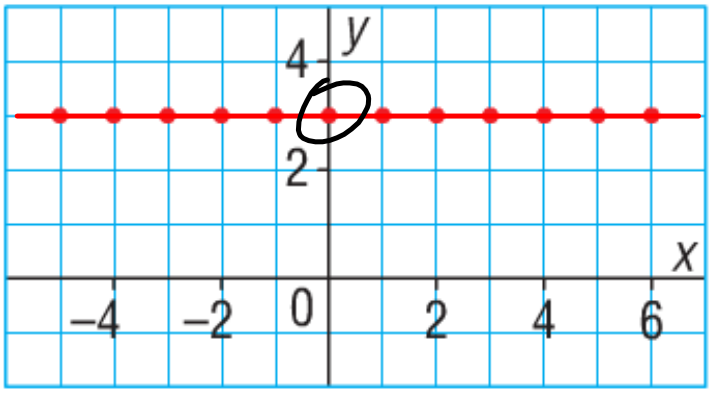
VERIFICATION [using point (1 , -1)]:

$y = 2x - 3$

$-1 = 2(1) - 3$

$-1 = 2 - 3$

$-1 = -1$



x	y
0	3
1	3
2	3

+1 +0

Equation?

$y = mx + b$

$y = 0(x) + 3$

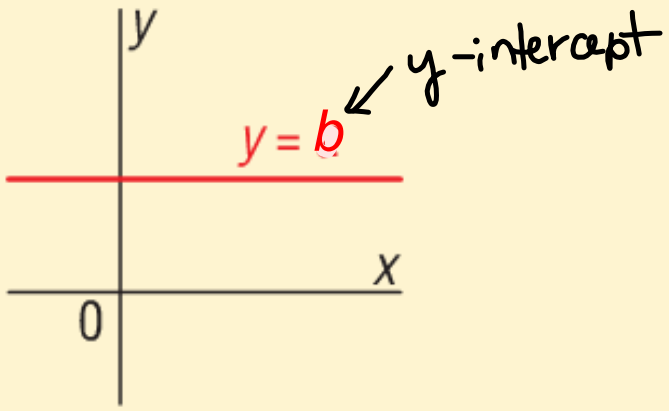
$y = 3$

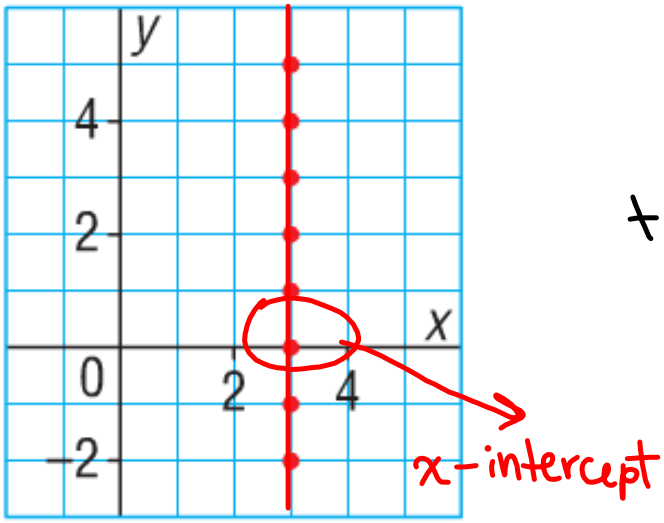
$m = \frac{\Delta y}{\Delta x}$

$= \frac{0}{1}$

$= 0$

The graph of the equation $y = b$, where b is a constant, is a horizontal line. Every point on the graph has a y-coordinate of b.





x-intercept

x	y
3	0
3	1
3	2

+0 +1

$m = \frac{\Delta y}{\Delta x} = \frac{1}{0}$ = undefined

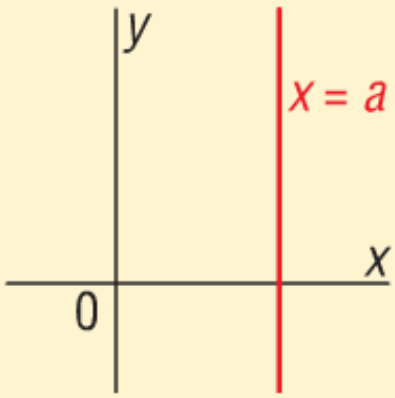
Equation?

~~$y = mx + b$~~

~~$y = ?(x) + b$~~ ?

$x = 3$

The graph of the equation $x = a$, where a is a constant, is a vertical line. Every point on the graph has an x-coordinate of a.



→ "x-intercept"

Example 1 Graphing and Describing Horizontal and Vertical Lines

For each equation below:

i) Graph the equation.

ii) Describe the graph.

a) $x = -4$

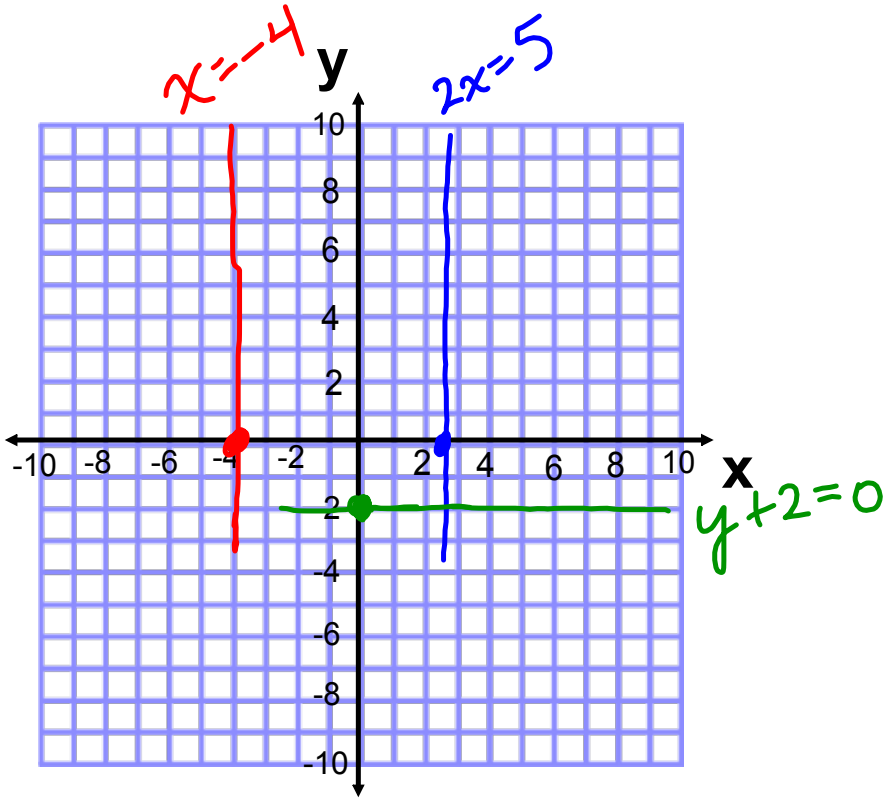
b) $y + 2 = 0$

c) $2x = 5$

$y = -2$

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

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



CONCEPT REINFORCEMENT:

***FPCM 10*:**
Page 362: #4 TO #9 & #11

Attachments

Worksheet - Function Notation.pdf