MAY 18, 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 continue 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
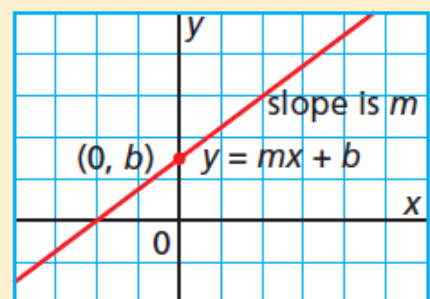*   match a set of linear relations to their graphs

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

## 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.

graph showing line with label $y = mx + b$, point $(0, b)$, slope is m, axes labeled x and y with origin 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.

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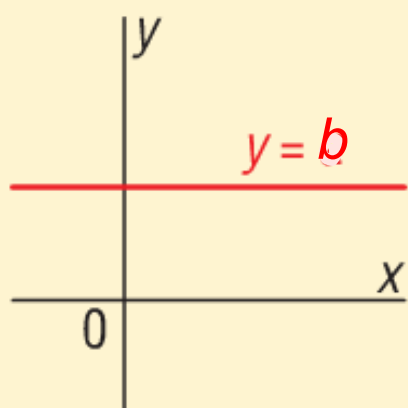
The graph of the equation $x = a$, where a is a constant, is a vertical line. Every point on the graph has an x-coordinate of a.

$x = a$
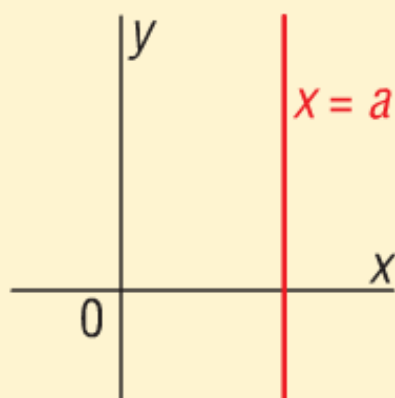
$m = \text{undefined}$

HOMEWORK QUESTIONS?
(page 362, #4 TO #9 & #11)

EXAMPLE:

The student council sponsored a dance. A ticket cost $5 and the cost for the DJ was $300.

a) Write an equation for the profit, P dollars, on the sale of t tickets.

b) Suppose 123 people bought tickets. What was the profit?

c) Suppose the profit was $350. How many people bought tickets?

d) Could the profit be exactly $146? Justify the answer.

SOLUTIONS:

a) $P = 5t - 300$

b) Use the equation:

$P = 5t - 300$

$P = 5(123) - 300$

$P = 615 - 300$

$P = 315$

The profit was $315.

c) Use the equation:

$$P = 5t - 300$$
$$350 = 5t - 300$$
$$350 + 300 = 5t - 300 + 300$$
$$650 = 5t$$
$$\frac{650}{5} = \frac{5t}{5}$$
$$130 = t$$

One hundred thirty people bought tickets.

SOLUTIONS (continued):

d) Use the equation:

$$P = 5t - 300$$
$$146 = 5t - 300$$
$$146 + 300 = 5t - 300 + 300$$
$$446 = 5t$$
$$\frac{446}{5} = \frac{5t}{5}$$
$$89.2 = t$$

Since the number of tickets sold is not a whole number, the profit cannot be exactly $146.

YOU TRY!

To join the local gym, Karim pays a start-up fee of $99, plus a monthly fee of $29.

a) Write an equation for the total cost, C dollars, for n months at the gym.

b) Suppose Karim went to the gym for 23 months. What was the total cost?

c) Suppose the total cost was $505. For how many months did Karim use the gym?

d) Could the total cost be exactly $600? Justify your answer.

[Answers: a) $C = 29n + 99$ b) $766
c) 14 months d) no]

b) $C = 29n + 99$
$C = 29(23) + 99$
$C = 667 + 99$
$C = \$766$

c) $C = 29n + 99$
$505 = 29n + 99$
$406 = 29n$
$14 = n$
months

d) $C = 29n + 99$
$600 = 29n + 99$
$501 = 29n$
$17.27... = n$

No

CONCEPT REINFORCEMENT:

FPCM 10:
Page 362:   #12
Page 363:   #13, #14, #16 and #17
Page 364:   #18 TO #24

Attachments

Worksheet - Function Notation.pdf