

Name: _____

Date: _____

Notes: Writing Linear Equations

Do Now: Find the equation of each linear relation in $y = mx + b$ form.

1) $8x - 3y = 13$

$$\begin{array}{r} -3y = -8x + 13 \\ \hline -3 \quad -3 \end{array}$$

$$y = \frac{8}{3}x - \frac{13}{3}$$

2) the output is five less than twice the input

$$y = 5 - 2x$$

$$2x - 5 = y$$

3) passes through (4,3) with slope = 3

$$y = mx + b$$

$$3 = 3(4) + b$$

$$3 = 12 + b$$

$$b = -9$$

$$y = 3x - 9$$

4) A line that passes through (2,5) and (6,7).

$$\frac{7-5}{6-2} = \frac{2}{4} = \frac{1}{2} = m$$

$$y = mx + b$$

$$5 = \frac{1}{2}(2) + b$$

$$5 = 1 + b$$

$$b = 4$$

$$y = \frac{1}{2}x + 4$$

5)

	$\Delta x + 3$				
x	4	7	10	13	16
y	7	19	31	43	55
	$\Delta y 12$				

$$m = \frac{\Delta y}{\Delta x} = \frac{12}{3} = 4$$

$$y = 4x + b$$

$$7 = 4(4) + b$$

$$7 = 16 + b$$

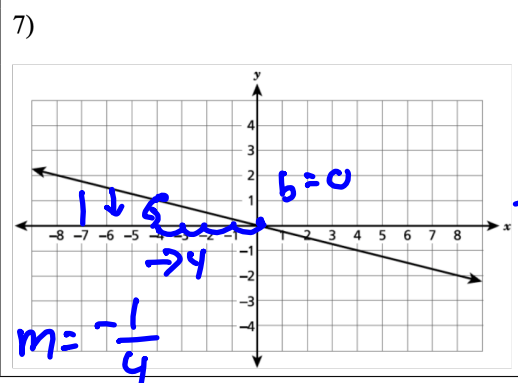
$$b = -9$$

$$y = 4x - 9$$

6)

A car leaves Albany, NY, and travels west toward Buffalo, NY. The equation $D = 280 - 59t$ can be used to represent the distance, D , from Buffalo after t hours. In this equation, the 59 represents the

- car's distance from Albany
- speed of the car
- distance between Buffalo and Albany
- number of hours driving



$$y = -\frac{1}{4}x$$

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Classwork: Writing Linear Equations

Find the equation of each linear relation in $y = mx + b$ form.

1) passes through $(-3, 7)$ with slope $= \frac{3}{2}$

$y = mx + b$
 $7 = (\frac{3}{2})(-3) + b$
 $7 = -4.5 + b$
 $11.5 = b$

$y = \frac{3}{2}x + 11.5$

2) passes through $(7, 0)$ and $(0, -5)$

$m = \frac{-5 - 0}{0 - 7} = \frac{-5}{-7} = \frac{5}{7}$

$y = \frac{5}{7}x - 5$

3)

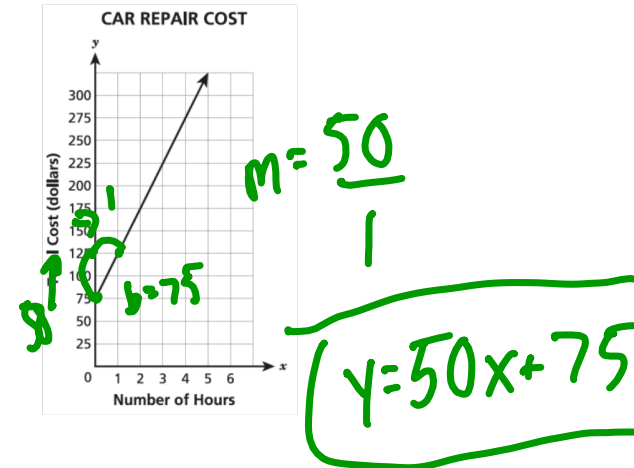
x	y
-7	14
-5	8
-3	2
-1	-4
1	-10

$\Delta x = +2$
 $\Delta y = -6$
 $m = \frac{-6}{2} = -3$

$y = -3x + 7$

$y = -3x + b$
 $-10 = -3(1) + b$
 $-10 = -3 + b$
 $b = -7$

4)



5)

A cell phone company charges \$60.00 a month for up to 1 gigabyte of data. The cost of additional data is \$0.05 per megabyte. If d represents the number of additional megabytes used and c represents the total charges at the end of the month, which linear equation can be used to determine a user's monthly bill?

- (1) $c = 60 - 0.05d$ (3) $c = 60d - 0.05$
 (2) $c = 60.05d$ (4) $c = 60 + 0.05d$

6)

Madison created two functions.
For Function A, the value of y is two less than four times the value of x .
The table below represents Function B.

Function B

x	y
-3	-9
-1	-5
1	-1
3	3

In comparing the rates of change, which statement about Function A and Function B is true?

- A Function A and Function B have the same rate of change.
- B Function A has a greater rate of change than Function B has.
- C Function A and Function B both have negative rates of change.
- D Function A has a negative rate of change and Function B has a positive rate of change.

A: $y = 4x - 2$

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

$y = 2x + b$

7)

The table below represents a linear function.

x	y
-1	5
1	9
3	13
5	17

Which function has a greater slope and a greater y -intercept than the linear function represented in the table?

- A $y = 2x + 8.5$
- B $y = 3x + 7.5$
- C $y = 5x + 6.5$
- D $y = 10x + 5.5$

$m = \frac{9-5}{1-(-1)} = \frac{4}{2} = 2$

$y = 2x + b$

$9 = 2(1) + b$

$9 = 2 + b$

$b = 7$

$y = 2x + 7$

8)

Function P is a linear function with a y -intercept of 5. Function Q is defined by the equation $y = -\frac{1}{3}x + 4$. Which statement must be true about functions P and Q?

- A Both functions have the same slope.
- B Both functions have a negative slope.
- C The functions will have the same input when $y = 0$.
- D The functions will have different outputs when $x = 0$.

y -intercept is when $x = 0$
+

9)

Which chart could represent the function $f(x) = -2x + 6$?

x	f(x)
0	6
2	10
4	14
6	18

(1)

x	f(x)
0	8
2	10
4	12
6	14

(3)

x	f(x)
0	4
2	6
4	8
6	10

(2)

x	f(x)
0	6
2	2
4	-2
6	-6

(4)

x	y
0	6
2	2
4	-2
6	-6

10)

Tanya is making homemade greeting cards. The data table below represents the amount she spends in dollars, $f(x)$, in terms of the number of cards she makes, x .

x	f(x)
4	7.50
6	9
9	11.25
10	12

x_1 y_1
 x_2 y_2

$$\frac{12 - 9}{10 - 6} = \frac{3}{4} = m$$

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

$$9 = \frac{3}{4}(6) + b$$

$$9 = 4.5 + b$$

$$b = 4.5$$

Write a linear function, $f(x)$, that represents the data.

$$f(x) = \frac{3}{4}x + 4.5$$

Explain what the slope and y -intercept of $f(x)$ mean in the given context.

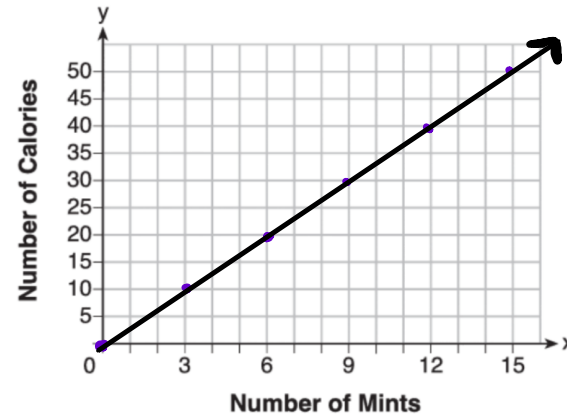
Slope: the amount Tanya spends for each card that she makes

y -intercept: the start up cost of making homemade greeting cards

11)

Max purchased a box of green tea mints. The nutrition label on the box stated that a serving of three mints contains a total of 10 Calories.

On the axes below, graph the function, C , where $C(x)$ represents the number of Calories in x mints.



$$C(x) = \frac{10}{3}x$$

x	y
0	0
3	10
6	20
9	30
12	40
15	50

Write an equation that represents $C(x)$.

$$C(x) = \frac{10}{3}x$$

A full box of mints contains 180 Calories. Use the equation to determine the total number of mints in the box.

$$\left(\frac{3}{10}\right)180 = \frac{10}{3}x \left(\frac{3}{10}\right)$$

$$x = 54$$

$$54 \text{ mints}$$