Name:_____ Date:_____

Notes
Algebra Section 4.2
Pages 215-221

Goal: "You will use a table to graph a linear equation"
"You will graph horizontal and vertical lines"
"Choose appropriate *x* values"

Vocabulary

Linear Equation: Any equation whose graph is a straight line. Linear equations can be written in the form $Ax + By = C$, which is called "Standard Form".

In this form, both A and B cannot be zero.

Solution: **Any ordered pair (x,y) that makes the equation true when substituted.

** Any point on the line

** Note: Since a line continues on forever in both directions, and there are infinite points on a line, then a linear equation has infinite solutions.

Example: Which ordered pair is a solution to : $3x - y = 7$; (3,4) or $(1,-4)$? Explain.

$(3,4)$

x= 3
y= 4

Plug x and y into the equation.

$3x - y = 7$
$3(3) - 4 = 7$
$9 - 4 = 7$
$5 = 7$
No

$(1,-4)$

x= 1
y= -4

Plug x and y into the equation.

$3x - y = 7$
$3(1) - (-4) = 7$
$3 - (-4) = 7$
$7 = 7$
Yes

Which one is a solution to the equation? $(1,-4)$

Try These:

1) Which ordered pair is a solution to: $2x - 6 = 3y$; (3,-2) or (0,-2)?

$(0,-2)$

2) Tell whether $\left(4, -\frac{1}{2}\right)$ is a solution to $x + 2y = 5$. Why or why not?

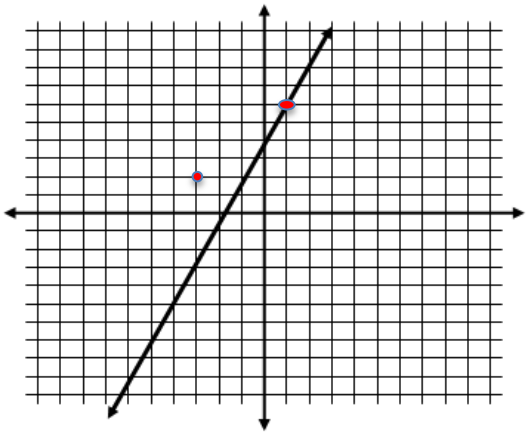
$4 + 2\left(-\frac{1}{2}\right) = 5$
$4 + (-1) = 5$
$3 = 5$
No

When the values are put in the equation is not true.

3) Are the following points solutions to the linear equation represented by the line graphed?

a) (1, 6)
b) (–3, 2)

a is a solution but b is not a solution



4) List three ordered pairs that are solutions to the equation $3x - 5 = y$

$(-2, -11)$ $(1, -2)$ $(4,7)$

$(-1, -8)$ $(2,1)$ $(5,10)$

$(0, -5)$ $(3,4)$ $(6,13)$

5) If x is 5, what ordered pair is a solution to the equation $2x + 4y = 8$?

$y = -\frac{1}{2}$ $\left(5, -\frac{1}{2}\right)$

Graphing a linear equation by making a table:

Make sure the equation is in Function form!

1) Rewrite the equation so it is in function form which means to isolate y

Example: $-2x + y = -3$

$y = -3 + 2x$

2) Choose 5 appropriate values for x. Typically these values are: $-2, -1, 0, 1, 2$

**Do not choose these values if:

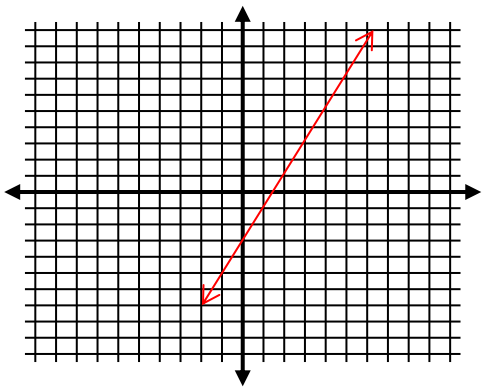
- There is a restriction on the domain. For example, if it says $x \geq 0$, then you must choose only positive values, or if dealing with time. Time cannot be negative.

-If after putting the equation in function form, the coefficient of x is a fraction, then it makes most sense to choose multiples of the denominator to avoid fractions.

3) Plug your 5 values into the function for x, find out what y is for each to complete your table.

x	-2	-1	0	1	2
y	-7	-5	-3	-1	1

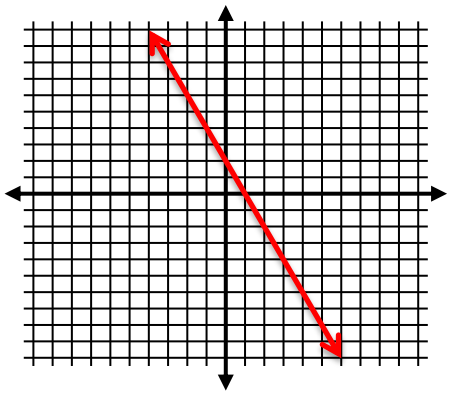
4) Graph the ordered pairs you now have from your table.



Try These:

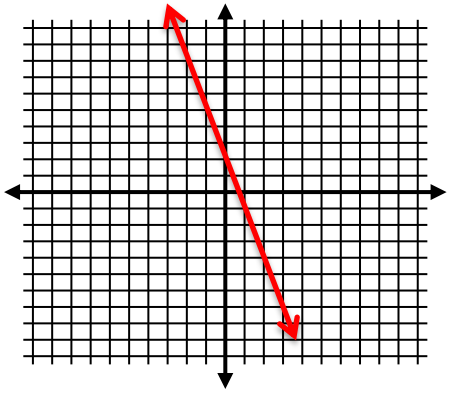
1) Graph $y = 2 - 2x$

x	-2	-1	0	1	2
y	6	4	2	0	-2

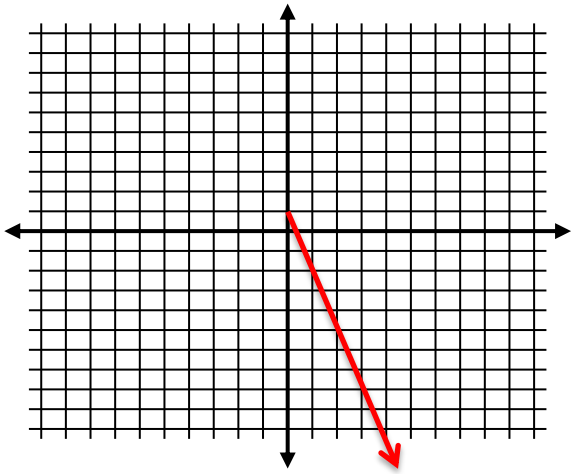


2) Graph $y + 3x = 2$

x	-2	-1	0	1	2
y	8	5	2	-1	-4



3) Graph $y = -3x + 1$ with a domain of $x \geq 0$ *which values can you **not** choose for x? Why? You cannot choose negative values because x is greater than or equal to 0.



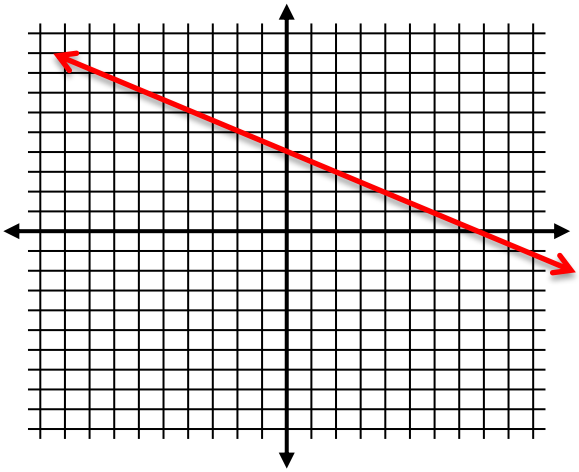
x	0	1	2	3	4
y	1	-2	-5	-8	-11

***Identify the range…**

$y \leq 1$

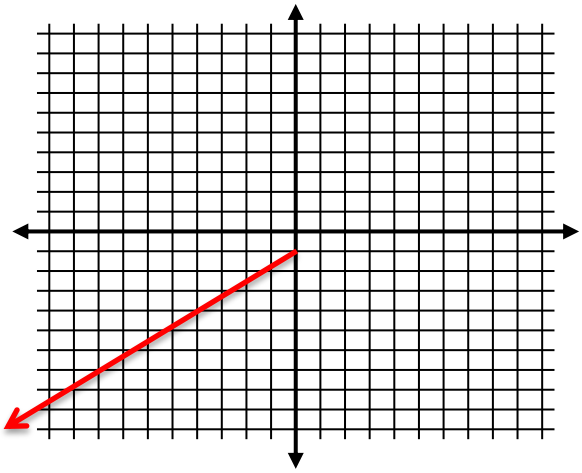
4) Graph $y = -\frac{1}{2}x + 4$ **which values should you pick for x? Why?

0 and multiples of 2 to eliminate the fraction.



x	0	2	4	6	8
y	4	3	2	1	0

5) Graph $y = \frac{2}{3}x - 1$ with a domain of $x \leq 0$ then identify the range.

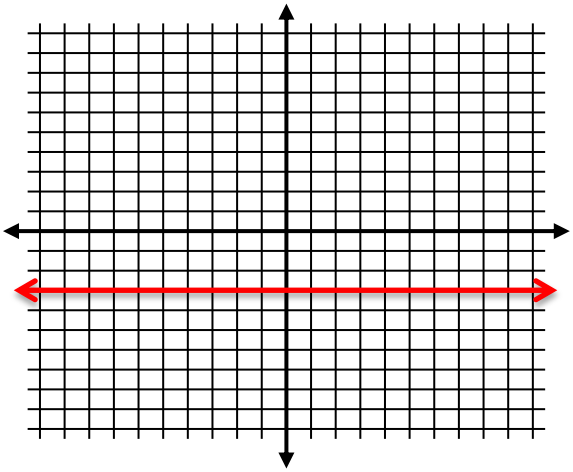


x	-12	-9	-6	-3	0
y	-9	-7	-5	-3	-1

Range: $y \leq -1$

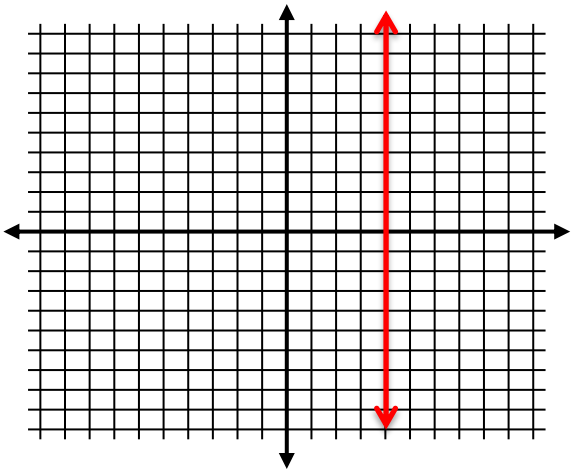
6) Graph $y = -3$

x	-2	-1	0	1	2
y	-3	-3	-3	-3	-3



7) Graph $x = 4$

x	4	4	4	4	4
y	-2	-1	0	1	2



8) The distance, d, in miles, that a runner travels is given by the function $d = 6t$ where t is the time (in hours) spent running. The runner plans to go for a 1.5 hour run. Set up a table and identify the domain and range of the function. Choose at least 4 values for t.

t	0	0.5	1	1.5
d	0	3	6	9

Domain: $1.5 \geq t \geq 0$
Range: $9 \geq d \geq 0$

9) Suppose the same runner decides he wants to run 12 miles. Set up a new table with at least 3 values and identify the new domain and range.

t	0	1	2
d	0	6	12

Domain: $0 \leq t \leq 2$
Range: $0 \leq d \leq 12$

10) For gas that costs \$2 per gallon, the equation $C = 2g$ gives the cost, C, in dollars for g gallons of gas. You plan to pump \$10 worth of gas. Set up a table and identify the domain and range.

g	0	1	2	3	4	5
C	0	2	4	6	8	10

Domain: $0 \leq g \leq 5$
Range: $0 \leq C \leq 10$