PRINCIPLES - LESSON 6F
GRAPHING BY TABLES

Recall: **The solutions to an equation with 2 variables are ordered pairs.**

ex1) List <u>all</u> solutions to the following equation:

$$x + y = 2$$

$x = 1$	$x = 2$	$x = -7$	$x = 3$	$x = \frac{1}{2}$
$y = 1$	$y = 0$	$y = 9$	$y = -1$	$y = 1\frac{1}{2}$
$(1, 1)$	$(2, 0)$	$(-7, 9)$	$(3, -1)$	$(\frac{1}{2}, 1\frac{1}{2})$

This is impossible. There are an infinite number of solutions!

CREATING A TABLE OF SOLUTIONS

Since it is impossible to list all the solutions to the equation, we can try something else. We will create a table of <u>some</u> of the solutions.

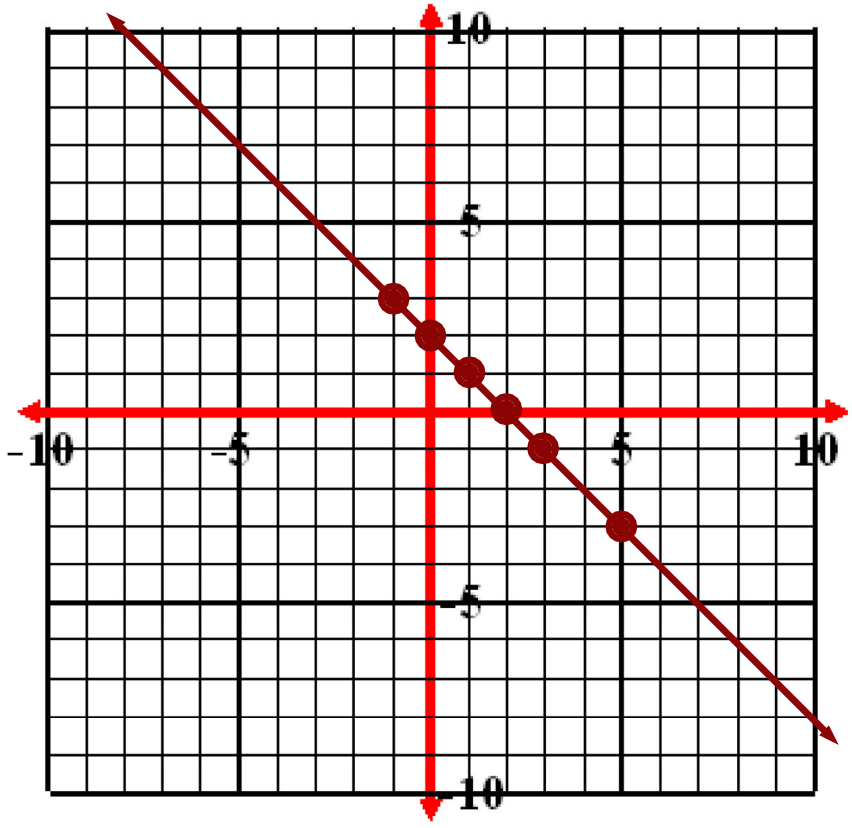
x	y
0	2
2	0
1	1
3	-1
-1	3
5	-3

Equation: $x + y = 2$

GRAPHING EQUATIONS BY CREATING A TABLE

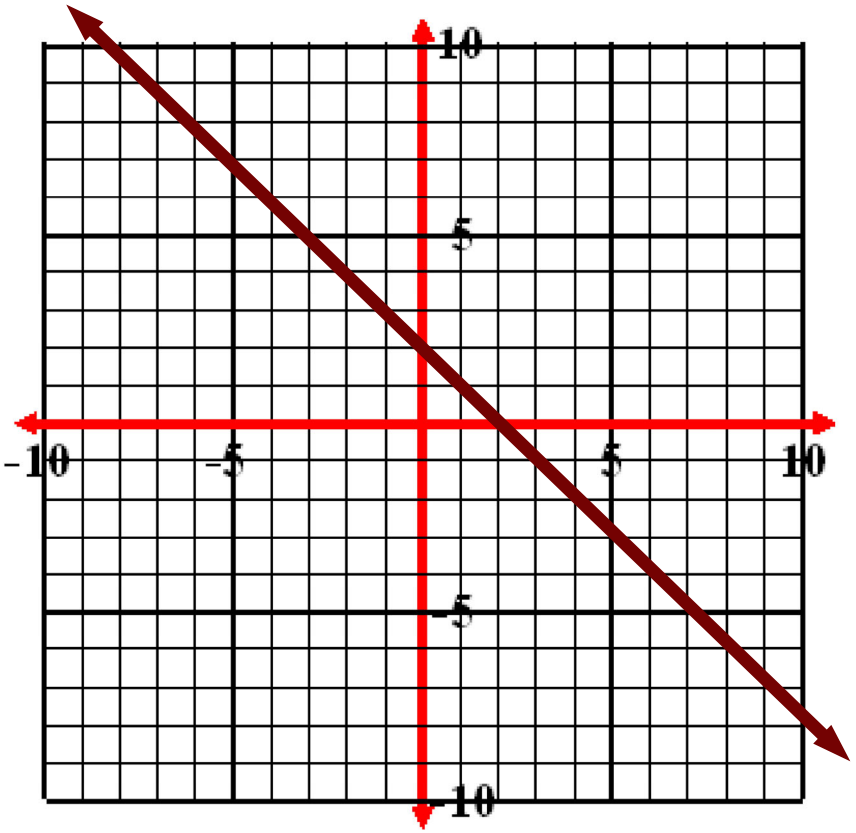
ex2) Graph: $x + y = 2$

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



LINEAR EQUATIONS

We know that there are an infinite number of ordered pairs that are solutions to the equation. These ordered pairs form a straight line.



$$x + y = 2$$

Since graphing ALL of the solutions to this equation results in a straight line that never ends, the equation is called a **linear equation**.

GRAPHING EQUATIONS BY CREATING A TABLE

ex3) Graph the linear equation below by creating a table.

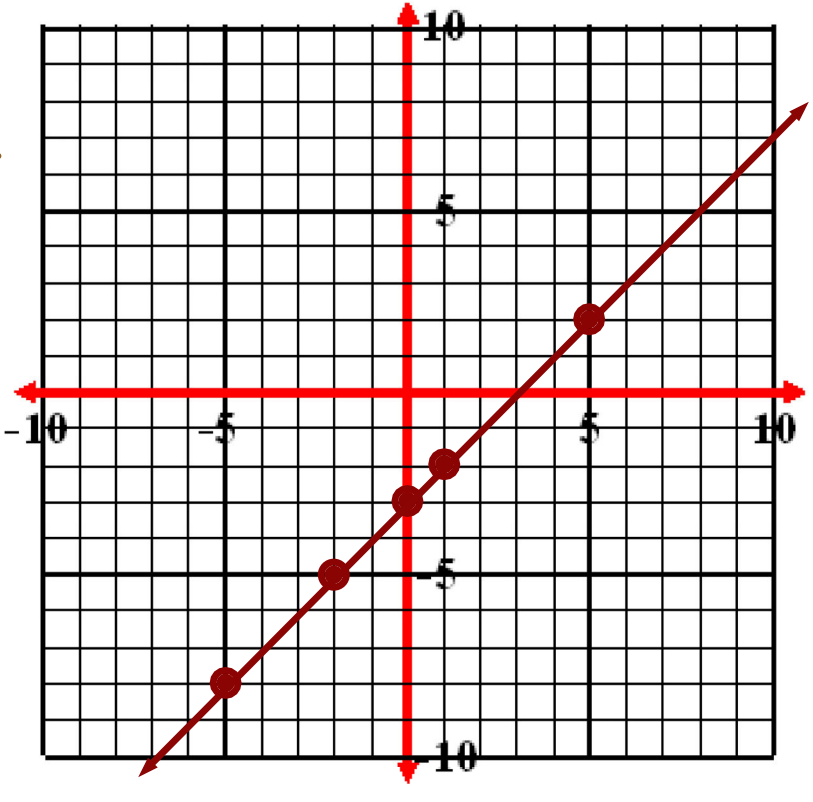
$$y = x - 3$$

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

Choose x-values.

Figure out the corresponding y-value for each x.

When $x = -2$,
$y = x - 3$
$y = -2 - 3 = -5$



GRAPHING EQUATIONS BY CREATING A TABLE

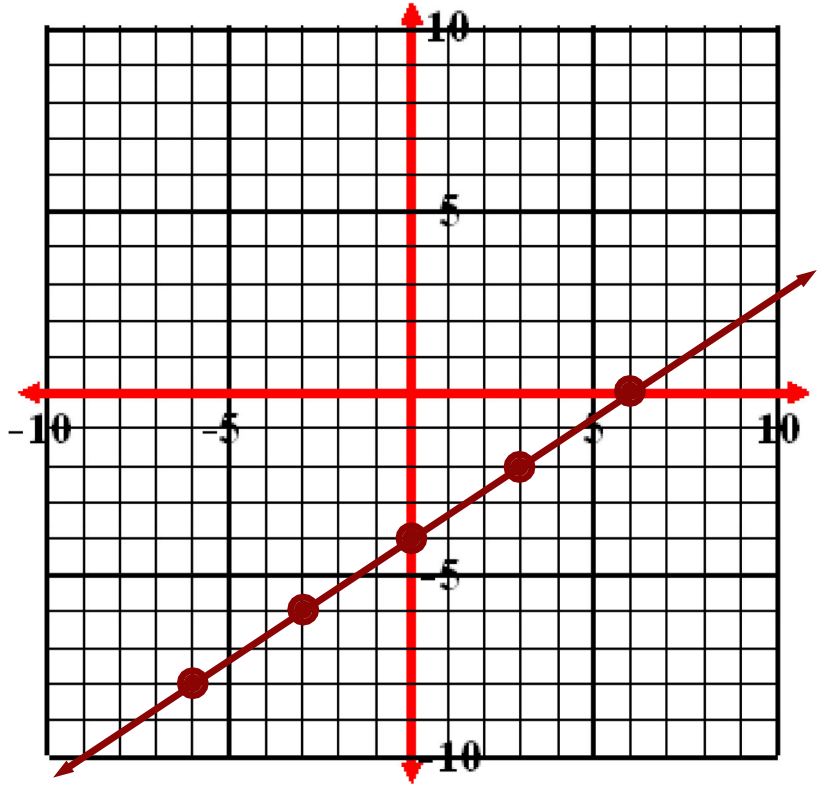
ex4) Graph the linear equation below by creating a table.

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

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

You can choose any x-values you want.

If you choose x-values that are multiples of the denominator, you can end up without fractions



HOW MANY POINTS ARE NECESSARY FOR OUR TABLES?

How many points are necessary in order to be sure that we have graphed the correct line?

We will plot 3 points to create the graph of an equation

Why that many?

We can draw a straight line between any TWO points. If we plot 3 points and they all lie on a straight line, then we can be sure that our line is correct.

GRAPHING EQUATIONS BY CREATING A TABLE

TO GRAPH LINEAR EQUATIONS BY THE TABLE METHOD:

1. Solve the equation for y.
2. Create a table of points by choosing x-values and then finding the corresponding y-values. You need 3 points.
3. Plot each of the ordered pairs on a coordinate plane.
4. Using a straightedge, connect the points to make a line.

GRAPHING EQUATIONS BY CREATING A TABLE

ex5) Graph the linear equation below by creating a table.

$$4y + 3x = 12$$

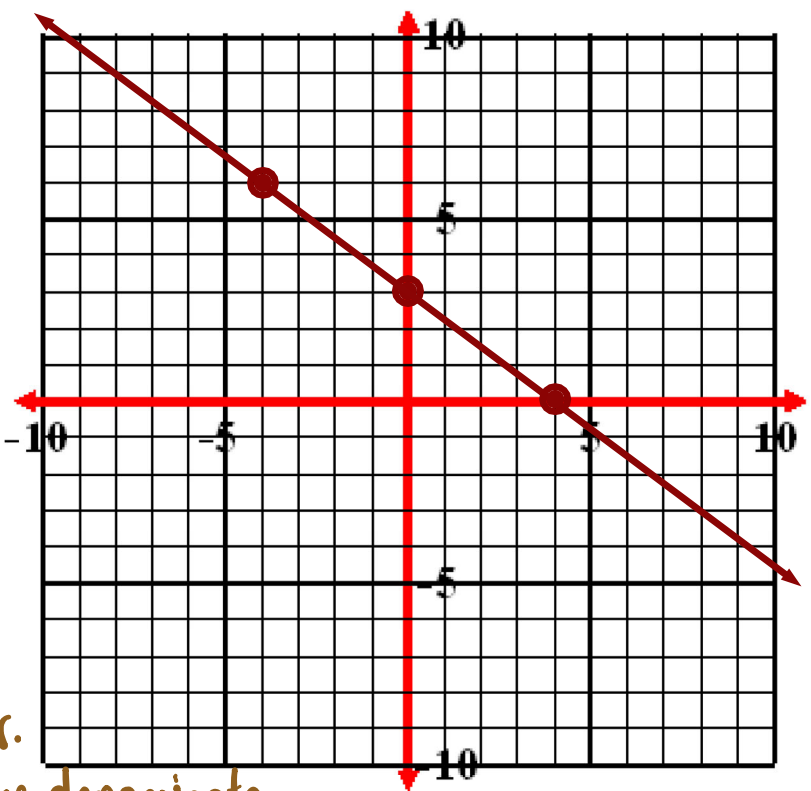
$-3x \quad -3x$

It is much easier to create a table when the equation is SOLVED FOR Y.

x	y
0	3
4	0
-4	6

$$\frac{4y}{4} = \frac{-3x}{4} + \frac{12}{4}$$

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



Smart x choices:

1. Choose zero.
2. Choose the denominator.
3. Choose the opposite of the denominator.

GRAPHING EQUATIONS BY CREATING A TABLE

ex6) Graph the linear equation below by creating a table.

Solve for y!

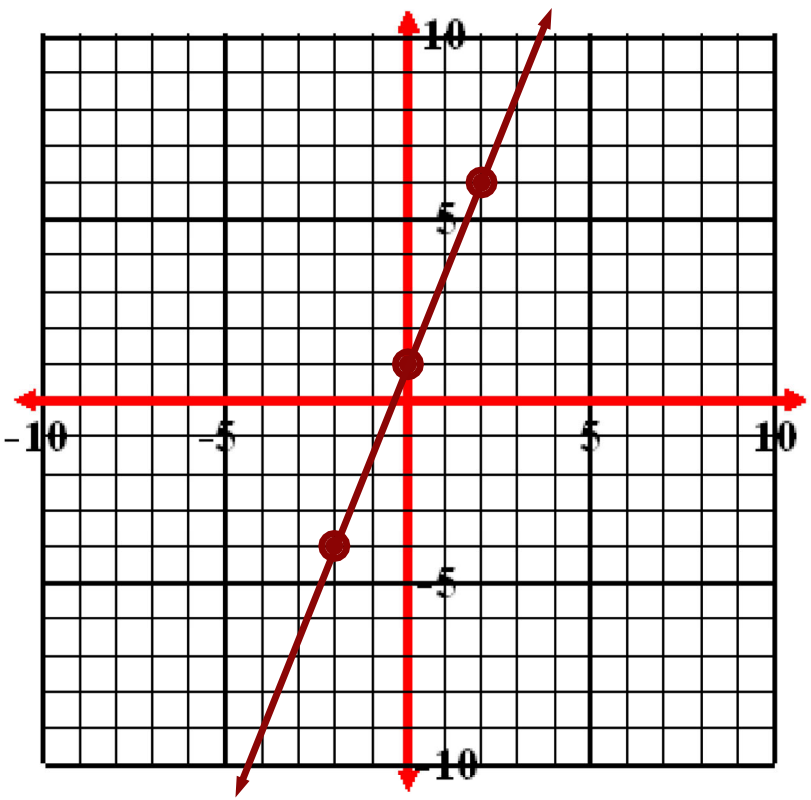
$$2y - 5x = 2$$

$+5x \quad +5x$

x	y
0	1
2	6
-2	-4

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

$$y = \frac{5}{2}x + 1$$



GRAPHING EQUATIONS BY CREATING A TABLE

ex7) Graph the linear equation below by creating a table.

$$y = 4$$

x	y
0	4
4	4
9	4
-4	4
-8	4

No matter which x-values we choose, y is ALWAYS 4.

The graph of y = constant is always a HORIZONTAL LINE.