Math 9 – Coordinate Geometry Name: Mr. Hagen

Lesson #2: Graphing Linear Relationships Date: Feb 28, 2018

Once again, we will begin with some new vocabulary:

Independent Variable → x-coordinate

- a variable that stands alone, is not affected by other variables
- it is what you use when you "measure something"

- time is unchangeable:
- distance = 100km/h

Dependent Variable → y-coordinate

- a variable that relies on other information, or the independent variable
- it changes as the independent variable changes

Linear Relationship

- when the x and y are graphed, they form a straight line. There is a constant and equal rate of change.

Table of Values

- a table listing the x and corresponding y-values

The goal for today's lesson is to graph a linear relationship using this algorithm:

1. Rearrange the equation so it is dependent variable = everything else (or y=______)
2. Create a Table of Values and choose an appropriate set of x-coordinates.
3. Use that set and calculate the corresponding y-coordinates.
4. Create the point (x,y).
5. Plot the points.
6. Draw a line through the points (do not just connect them).

Your table of values should look like this:

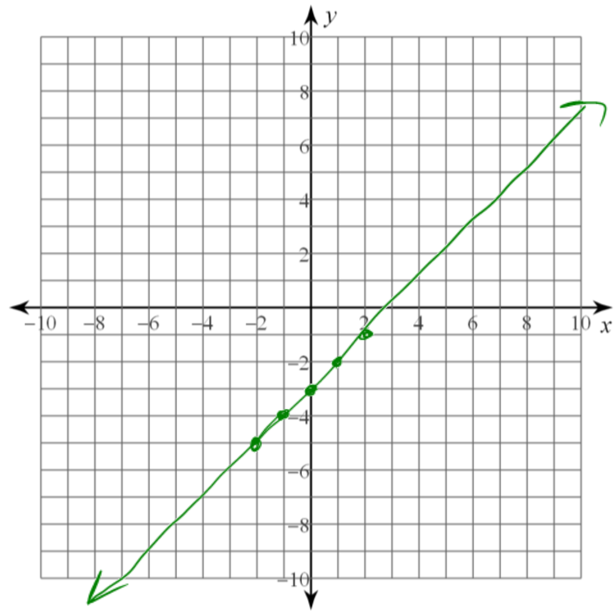
x	y	(x,y)
Set of x-coordinates	Corresponding y-coordinates	Set of points to plot

* Alway use $x = -2, -1, 0, 1, 2$

Examples:

1. $y = x - 3$

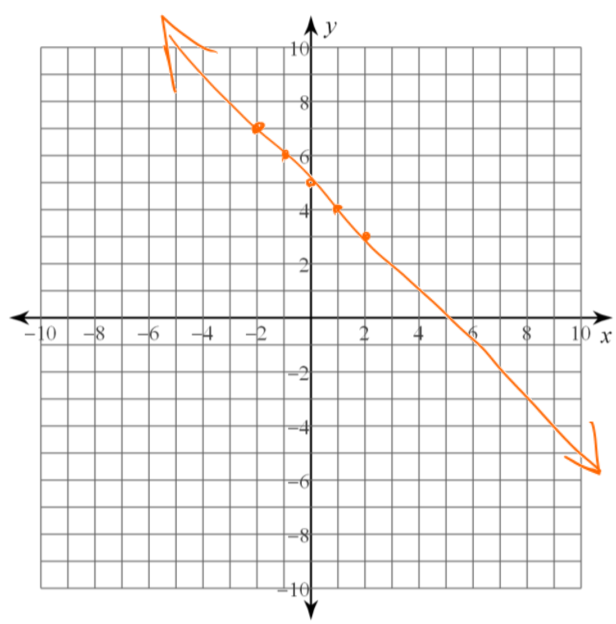
x	$y = x - 3$	(x, y)
-2	$(-2) - 3 = -5$	$(-2, -5)$
-1	$(-1) - 3 = -4$	$(-1, -4)$
0	$(0) - 3 = -3$	$(0, -3)$
1	$(1) - 3 = -2$	$(1, -2)$
2	$(2) - 3 = -1$	$(2, -1)$



2. $x + y = 5$ $\quad -x \quad -x$

$y = 5 - x$

x	$y = 5 - x$	(x, y)
-2	$5 - (-2) = 7$	$(-2, 7)$
-1	$5 - (-1) = 6$	$(-1, 6)$
0	$5 - (0) = 5$	$(0, 5)$
1	$5 - (1) = 4$	$(1, 4)$
2	$5 - (2) = 3$	$(2, 3)$



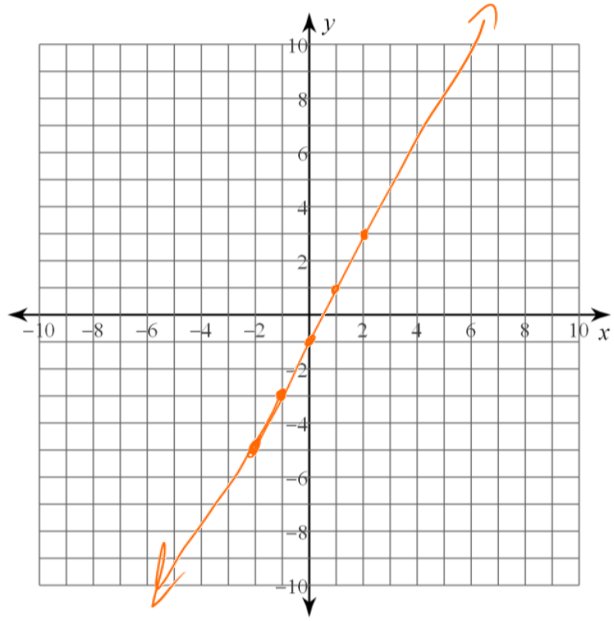
- If the y is positive, leave it and move the other stuff.
- If the y is negative, move it.

3. $2x - y = 1$ $+y$

$2x - 1 = 1 - 1 + y$

$2x - 1 = y$ or $y = 2x - 1$

x	$y = 2x - 1$	(x, y)
-2	$2(-2) - 1 = -5$	$(-2, -5)$
-1	$2(-1) - 1 = -3$	$(-1, -3)$
0	$2(0) - 1 = -1$	$(0, -1)$
1	$2(1) - 1 = 1$	$(1, 1)$
2	$2(2) - 1 = 3$	$(2, 3)$

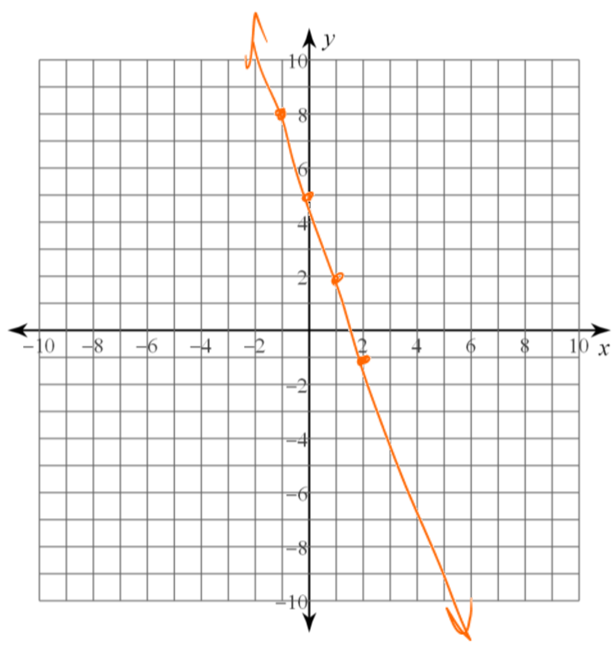


4. $6x + 2y - 10 = 0$ $-6x + 10$

$$\frac{2y}{2} = \frac{-6x}{2} + \frac{10}{2}$$

$y = -3x + 5$

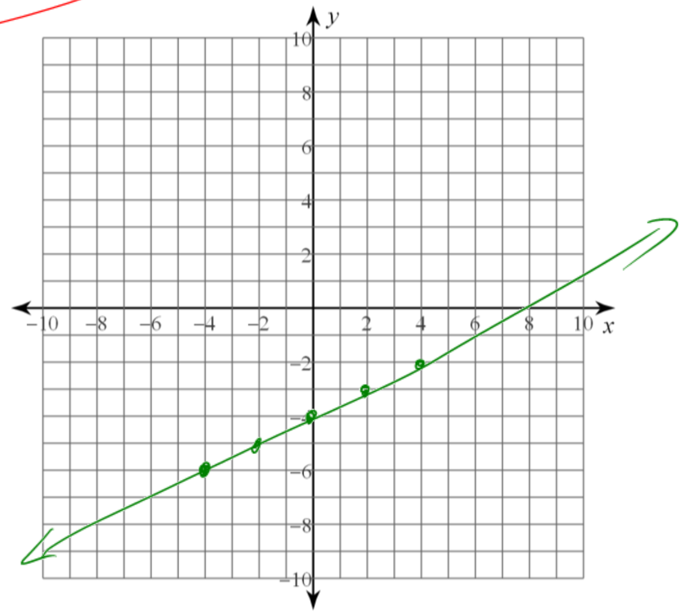
x	$y = -3x + 5$	(x, y)
-2	$-3(-2) + 5 = 11$	$(-2, 11)$
-1	$-3(-1) + 5 = 8$	$(-1, 8)$
0	$-3(0) + 5 = 5$	$(0, 5)$
1	$-3(1) + 5 = 2$	$(1, 2)$
2	$-3(2) + 5 = -1$	$(2, -1)$



Take the standard set of $x = -2, -1, 0, 1, 2$ and multiply them by the denominator infront of the "x"

5. $y = \frac{1}{2}x - 4$

X	y=	(x, y)
-4	$\frac{1}{2}\left(\frac{-4}{1}\right) - 4 = -6$	$(-4, -6)$
-2	$\frac{1}{2}\left(\frac{-2}{1}\right) - 4 = -5$	$(-2, -5)$
0	$\frac{1}{2}\left(\frac{0}{1}\right) - 4 = -4$	$(0, -4)$
2	$\frac{1}{2}\left(\frac{2}{1}\right) - 4 = -3$	$(2, -3)$
4	$\frac{1}{2}\left(\frac{4}{1}\right) - 4 = -2$	$(4, -2)$



6. $3x \boxed{-4y} = 12$

$+4y \quad +4y \quad -12 \quad -12$

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

$$\frac{3}{4}x - 3 = y \qquad \text{or } y = \frac{3}{4}x - 3$$

x	$y = \frac{3}{4}x - 3$	(x, y)
-8	$\boxed{\frac{3}{4}\left(\frac{-8}{1}\right)}^{=-6} - 3 = -9$	$(-8, -9)$
-4	$\frac{3}{4}(-4) - 3 = -6$	$(-4, -6)$
0	$\frac{3}{4}(0) - 3 = -3$	$(0, -3)$
4	$\frac{3}{4}(4) - 3 = 0$	$(4, 0)$
8	$\frac{3}{4}(8) - 3 = 3$	$(8, 3)$