UNIT 2 LESSON 1 – GRAPHING LINEAR FUNCTIONS

*The pairs of values (x, y) are called <u>ordered pairs</u>, and the set of all ordered pairs that satisfy an equation is called the <u>solution set</u>.

*When we plot these points, they usually form a curve. A <u>curve</u> is a <u>graphical representation</u> of the solution set for an equation. A <u>linear</u> equation forms a <u>straight line</u>.

*A linear equation can also be written in slope-intercept form, <u>$y = mx + b$</u> Where "m" is the slope of the line and "b" is the y-intercept.

*It is important to understand that the solution set for most equations is <u>infinite</u>; therefore, it is impossible to plot every point when graphing.

EX#1) Graph the solution set for the linear equation -3x + y = -2.

Step #1) Solve for y

-3x + y = -2

y = 3x - 2

Step #2) Make a table of values (Plug values for x into the equation to solve for y)

X	Y
0	-2
1	1
2	4

Step #3) Plot and connect the points on graph paper

EX#2) YOU TRY!!! Graph the solution set for the exponential equation $y = 3^x$.

Step #1) Make a table of values (no need to solve for y = equation is already solved for y)

X	Y
0	1
1	3
2	9

Step #2) Plot and connect the points on graph paper

FINDING X & Y INTERCEPTS AND THE SLOPE

The y-intercept is the value of y when x=0 OR the point where the line intersects the y-axis.

The x-intercept is the value of x when y=0 OR the point where the line intersects the x-axis.

To find the slope of a linear function, pick two points on the line and substitute the coordinates of the points into the

equation $m = \dfrac{y_2 - y_1}{x_2 - x_1}$

Where m is the slope, (x_1, y_1) are the coordinates of one point, and (x_2, y_2) are the coordinates of the other point.

If the equation of a line is in slope-intercept form, the slope is the _coefficient of x.

EX#3) Given the function $f(x) = -\dfrac{1}{5}x + 2$, use the slope and y-intercept to graph the function. Then, identify the x-intercept of the function.

Slope = $-\dfrac{1}{5}x$ y-intercept = (0, 2)

To find the x-intercept = make y = 0 and solve for x.

$$0 = -\frac{1}{5}x + 2$$

$$-2 = -\frac{1}{5}x$$

x = 10   So the x-intercept is (10, 0)

EX#4) Given the function $f(x) = -\dfrac{4}{3}x + 4$, solve for the x- and y-intercepts. Use the intercepts to graph the function.

To find the y-intercept = make x = 0

y-intercept = (0, 4)

To find the x-intercept = make y = 0 and solve for x.

$$0 = -\frac{4}{3}x + 4$$

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

x = 3   So the x-intercept is (3, 0)

EX#5) YOU TRY!!! Given the function $f(x) = -\dfrac{3}{5}x + 3$, identify the intercepts. Use the intercepts to graph the function.