**Lesson 5.1 Understanding Linear Functions**

***Linear Functions-*** every x-value is paired with exactly on y-value. Therefore, the graph is a non-vertical straight line.

***Linear Equation-***is any equation that can be written in the standard form, expressed below:

 $A\left(x\right)+B\left(y\right)=C $

Any ordered pair that makes the linear equation true is a ***solution of a linear equation in two variables.*** The graph of a linear equation represents all the solutions of the equation.

Once you concluded the equation is in standard form, solve the equation for the *y* variable to get the equation in the form of $y=mx+b$.

**Example 1:**

|  |  |
| --- | --- |
| x | y |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

$$5\left(x\right)+y=10$$

A = 5, B = 1, and C = 10

|  |  |
| --- | --- |
| x | y |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

**Example 2:**

$-4\left(x\right)+y=11$

A = -4, B = 1, and C = 11

|  |  |
| --- | --- |
| x | y |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

**Example 3:**

$$6\left(x\right)+y=12$$

A = , B = , and C =

**Example 4:**

Sal opens a new video store and pays the film studios $2.00 for each DVD he buys from them. The amount Sal pays is given by *f(x)*=2(x), where *x* is the number of DVDs purchased.

|  |  |
| --- | --- |
| x | y |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

$$f\left(x\right)=2(x)$$

Domain:

Range:

**Example 4:**

Else rents a booth in her grandfather’s mall to open an ice cream stand. She pays $1.00 to her grandfather for each hour of operation. The amount Elsa pays each hour is given by f(x)= x, where x is the number of hours her booth is open.

|  |  |
| --- | --- |
| x | y |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

$$f\left(x\right)=2(x)$$

Domain:

Range:

**5.2 Using Intercepts**

**Y-Intercepts** of a graph is the y-coordinate of the point where the graph intersects the y-axis. The x-coordinate of this point is always 0.

**X-Intercepts** of a graph is the x- coordinate of this point where the graph intersects the x-axis. The y-coordinate of this point is always 0.

**Example 1:**

3(x) – 2(y) = 6

To find the x-intercept, replace y with 0 To find the y-intercept, replace x with 0 and solve for x. and solve for y.

**Example 2:**

-5(x) + 6(y) = 60

x-intercept y-intercept

**Example 3:**

The Sandia Peak Tramway in Albuquerque, New Mexico, travels a distance of about 4500 meters to the top of Sandia Peak. Its speed is 300 meters per minute. The function $f\left(x\right)=4500-300\left(x\right)$ gives the tram’s distance in meters from the top of the peak after *x* minutes.

**x-intercept y-intercept**

Homework: Workbook Pages 205-207 (1, 4, 6, 13-16) & Workbook Page 216 (3-10)