Representing Linear Functions

- Objectives:
- Represent situations using a linear function
- Determine Domain and Range values
- Use a variety of methods to represent linear functions
- Represent functions in a variety of ways

Linear Function Definitions

- A linear function can be represented in a lot of different ways – tables, graphs and equations.
- When you determine that a function is linear, you can find the domain and range for that function.

Linear Function= a function that can be represented by a linear equation.

Linear Equation= an equation that graphs into a straight line.

Example

Use the table to find the solution

Determine whether the Data in the table represents a linear function.

- Step 1

Check the rate of change in the time.

The rate of change is constant, every 10 minutes.

- Step 2

Check the rate of change in distance.

This rate of change is **NOT** constant.

- The ANSWER –

Since the rate of change is NOT constant for both variables, the data does **NOT** represent a linear function.

Time (min)	Distance biked (miles)
10	3
+10	+3
20	6
+10	+4
30	10
+10	+4
40	14
+10	+3
50	17
+10	+2
60	19

Example 2

Determine whether $2y = 4x - 7$ represents a linear function.

First recall that the definition of a linear function is that it can be written in the form $Ax + By = C$ and A, B, and C are real numbers with A and B $\neq 0$.

Then get the equation in the right form.

$$2y = 4x - 7$$
$$-4x \quad -4x$$
$$-4x + 2y = -7$$

A B C

- The ANSWER –

Since the A = -4, B = 2 and C = -7, and each is a real number, the equation **does** represent a linear function.

Example 3

Determine whether $y^2 = 4$ represents a linear function.

Again recall that the definition of a linear function is that it can be written in the form $Ax^1 + By^1 = C$ and A, B, and C are real numbers with A and B ≠ 0.

When we look at the linear function standard form, we notice that both the x and y variable are exponent "1".

$$y^2 = 4$$

- The ANSWER –

Since the exponent of y is 2 (not 1) the equation does **NOT** represent a linear function.

Example

Make a table to help find the solution

The problem: Enrique earns $6.00 per hour working at Quikee Mart. He is saving his wages to buy a 3GB iPOD. The iPOD is on sale for $210.00. *How many hours must Enrique work so he will have enough money to buy his iPOD?*

- Step 1 - Make a table

- Step 2

Figure how much the domain and range values are changing. For the domain, you may use multiples of 5 to help you find the number of hours he needs to work

How do I know that this rate of change is constant?

- The ANSWER –

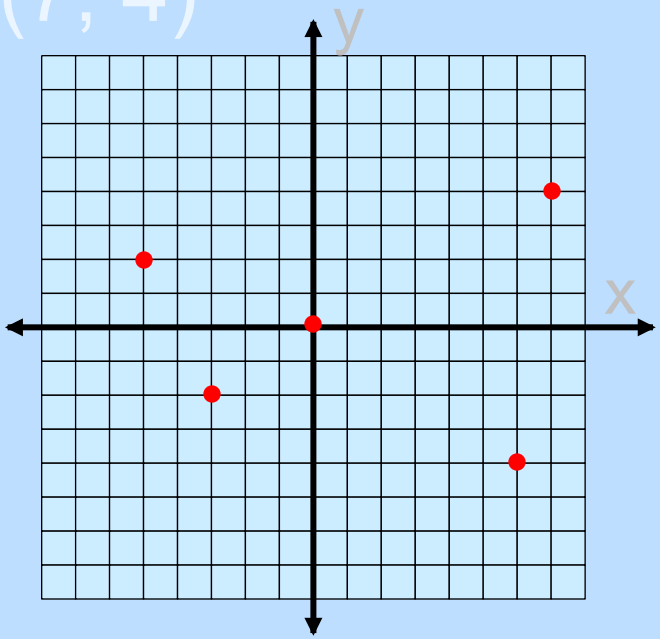
Enrique must work 35 hours to earn his iPOD.

Hours worked	Amount earned
5	$30
+5	+30
10	$60
+5	+30
15	$90
+5	+30
20	$120
+5	+30
25	$150
+5	+30
30	$180
+5	+30
35	$210

Identifying Domain and Range

- Name the domain and range for the set of ordered pairs.
- Then graph the ordered pairs to see if they represent a function.

(-5, 2), (-3, -2), (0, 0), (6, -4), (7, 4)



Domain: { -5, -3, 0, 6, 7 }

Range: { 2, -2, 0, -4, 4 }

Is this a function?

Yes, it passes the vertical line test

Conclusion

- A linear function can be represented in a lot of different ways – _____, _____ and _____.
- When you determine that a function is linear, you can find _____ and _____ for that function.

Linear Function = _____
_____.

Linear Equation = _____
_____.