**Notes - College Algebra 1**

**Section 4.2 – Patterns and Linear Functions**

Objective(s): To identify and represent patterns and describe linear functions.

Starter:

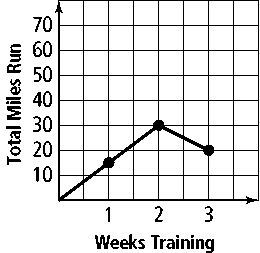
**Sketch a graph to represent the situation.**

**1.** During a trip, your speed increases during the first hour and decreases over the next 2 hours.

**2.** The average temperature steadily decreases over the course of the football season.

**3.** The average test score of the class increased throughout the semester until it decreased slightly on the last test.

**4. Error Analysis** During the first 2 weeks of training, Shelly ran 15 miles per week. Then, she increased to 20 miles per week. Describe and correct the error in sketching a graph to represent the relationship between the weeks and the total number of miles she has run.



**Section 4.2 – Patterns and Linear Functions**

Objective(s): To identify and represent patterns and describe linear functions.



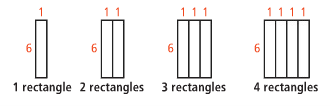
Dependent variable –

Independent variable –

Input –

Output -

Problem 1: In the diagram below, what is the relationship between the number of rectangles and the perimeter of the figure they form? Represent this relationship using a table, words, and equation and a graph



Step 1: Make a Table

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

Use x as the independent Variable and y as the independent variable.

Let x =

Let y =

Write each pair of input and output values x and y as an ordered pair (x, y)

1. What pattern exists in the x-values of the table?
2. What pattern exists in the y-values of the table?
3. What pattern can you use to determine a y-value in the table if you are given an x-value?

Step 2: Look for a pattern in the table. Describe the pattern in words so you can write an equation to represent the relationship.

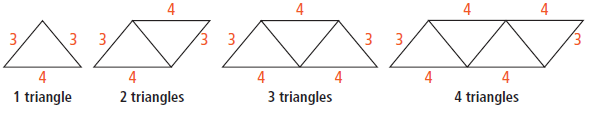
Words:

Equation:

Step 3: Use the table to make a graph.

Let’s Try it…

In the diagram below, what is the relationship between the number of triangles and the perimeter they form? Represent this relationship using a table, words, and equation and a graph.



X =

Y =

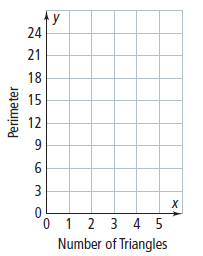
Step1:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

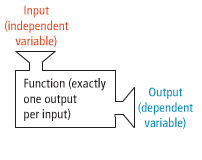
Step 2: Describe the pattern in words:

Write an equation:

Step 3: Use the table to make a graph



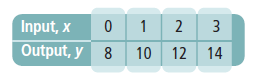
Function:



Linear Function:

Problem 2: Representing a Linear Function

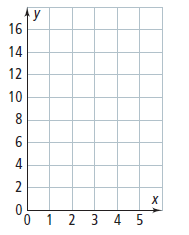
Is the relationship in the table a linear function? Describe the relationship using words, an equation and a graph.



Describe the pattern:

Write an equation for the relationship:

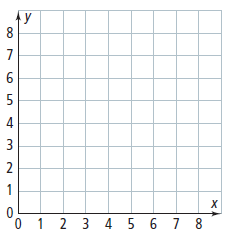
Plot the points from the table on the graph.



Underline the correct word or words to complete the sentence.

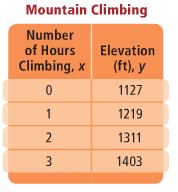
The points lie/do not lie on a line, so, the relationship is/is not a linear function.

Ex: Does the set of ordered pairs (0, 2), (1, 4), (3, 5) and (1, 8) represent a linear function.



Do the ordered pairs represent a linear function? Explain.

Ex: Determine whether the relationship is a linear function. Then represent the relationship using words, an equation, and a graph.



HW: Section 4.2 p. 243 #2, 5-10, 18, 19