FMP10 Name: _____
Date: _____

4.2 Linear Relations

Relation:

- An association between two quantities
- A connection (often a rule) between input values (x) and output values (y)

A relation can be presented in a variety of ways. For example,

Words

Three times the length of your ear, e, is equal to the length of your face, f, (from chin to hairline).

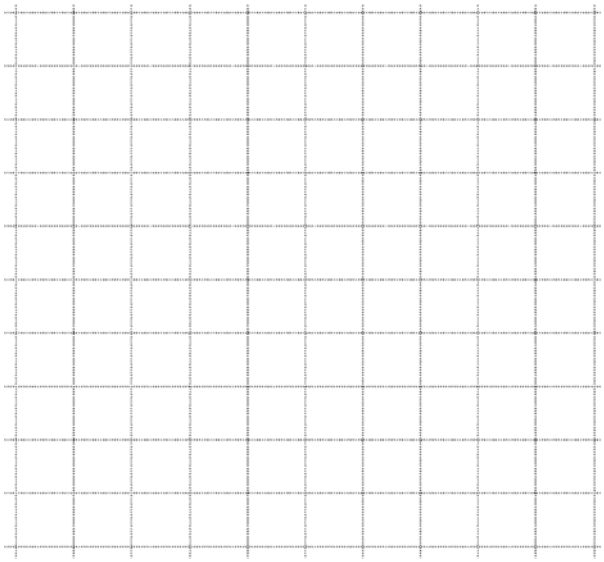
Equation

Ordered Pairs

Table of Values

Ear Length, e (cm)	Face Length, f (cm)

Graph



Independent Variable:

- **The variable we control**
- **The input variable**
- x
- **Graphed on the x-axis**
- **First column in a table of values**

Dependent Variable:

- **The variable we do not control**
- **The output variable**
- y
- **Graphed on the y-axis**
- **Second column in a table of values**

Linear Relation:

- **Forms straight line when graphed**
- **One or two variable equation of degree 1**
- **Input (independent) & output (dependent) each change by their own constant amount**

Non-linear Relation:

- **Does <u>NOT</u> form straight line when graphed**
- **One or two variable equation of degree <u>NOT</u> 1**
- **Input (independent) & output (dependent) <u>DO NOT</u> change by their own constant amount**

Ex. Table of Values

Linear

x	*y*

Non-Linear

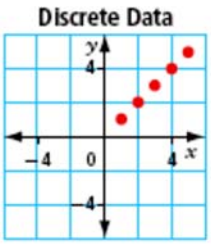
x	*y*

Ex. Equations

Linear

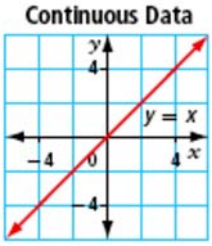
Non-Linear

Discrete Data:



- Data values that are NOT connected
- For data that CANNOT have values between

Continuous Data:



- Data values that ARE connected
- For data that CAN have values between

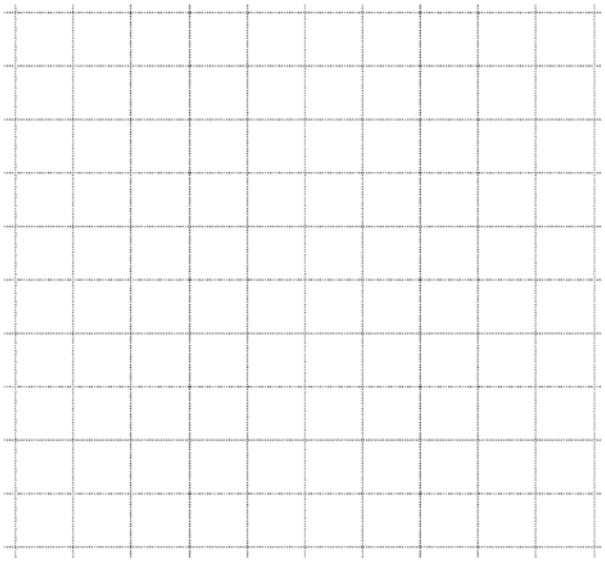
Ex. In a frog jumping championship there is a frog named George who jumps a distance of 2m in a single leap. George maintains a distance of 2m every jump; the total distance travelled is measured after every jump. Consider the relationship between the number of jumps and the total distance travelled.

a) Create a variable to represent each quantity in the relation. Which is the dependent variable? Which is the independent variable?

b) Create a table of values for this relation. What are appropriate values for the independent variable?

c) Identify the relationship as linear or non-linear. Explain how you know.

d) Create a graph for the relation. Is the data discrete or continuous?



Practice: pg. 287/ # 1 – 6, 8, 11, 12