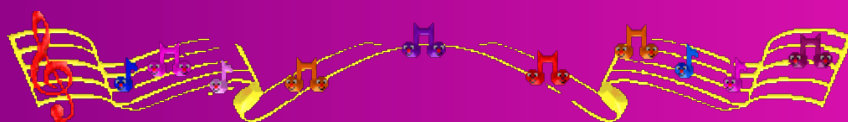


Chapter 5

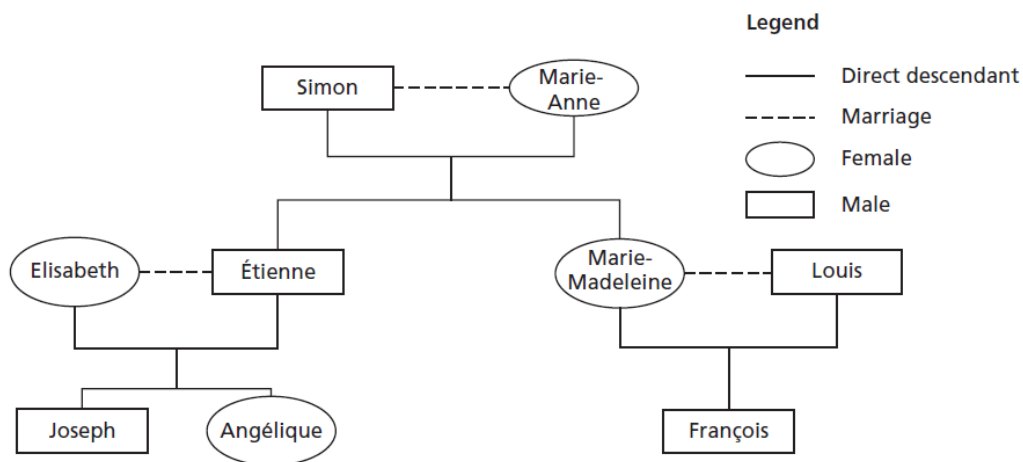
Functions & Relations



5.1 Representing Relations



How are we Related !!!!



- How is Joseph related to Simon?
- How are Angelique and Francois related?
- How does the family tree show these relations?



Terminology

A set is a collection of distinct objects.

Set of Fruit

Fruit

apple

blueberry

cherry

huckleberry

Set of Colours

Colour

red

green

blue

Sets use { }

Ordered pairs use (__, __)

An ***element*** of a set is one object in the set.

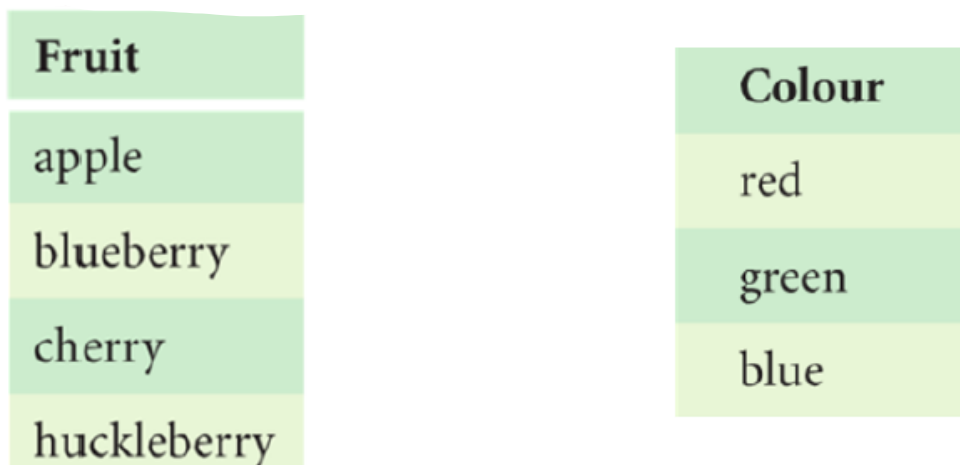


<u>Set of Fruit</u>
Fruit
apple
blueberry
cherry
huckleberry

Apple is an ***element*** of the set of Fruit

Terminology

Arrow diagram show how one set is related to another set



Sets use { }

Ordered pairs use (__, __)

Set of ordered pairs

relation

set

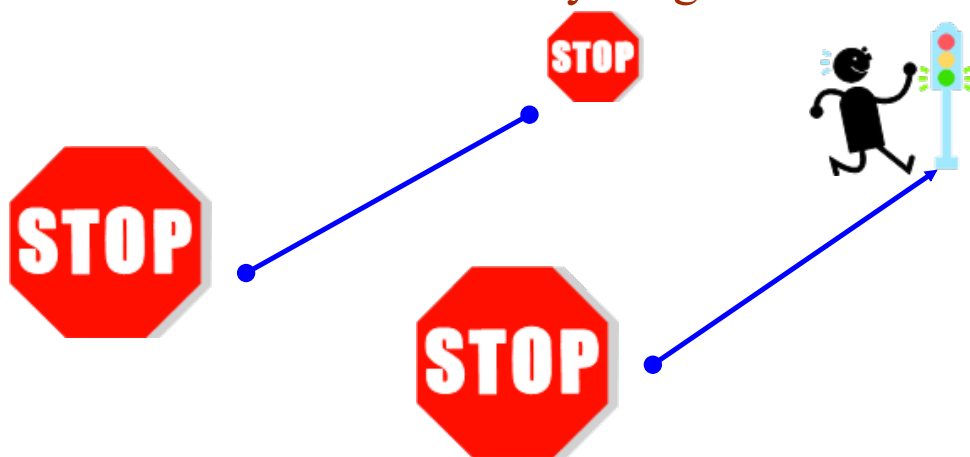
Independent / Dependent

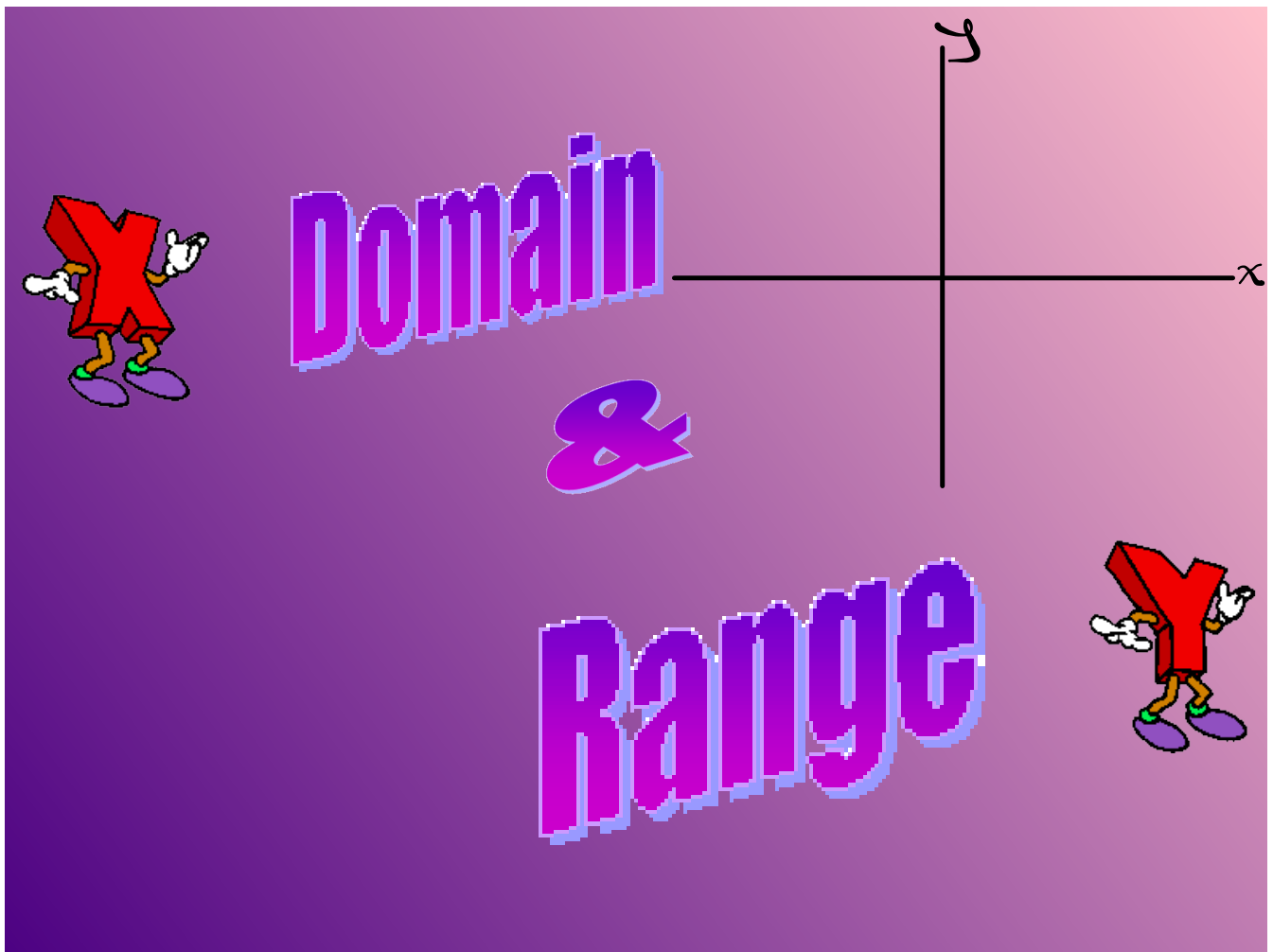
Dependent - a variable whose value is determined by the value of another (independent) variable.
(y) or range

Independent - a variable whose value is not determined by the value of another variable, and whose value determines the value of another (dependent) variable
(x) or domain

Limits?

There are limits to everything in life!







Domain & Range



Domain - the set of first elements in a relation

Range - the set of second elements in a relation

Input	Output
1	5
2	7
	9
4	
	13

Sport	Equipment
badminton	shuttlecock
badminton	racquet
hockey	puck
hockey	stick
tennis	ball
tennis	racquet
soccer	ball

First

Second

(**Sport, Equipment**)

Domain

The set of first elements:

{

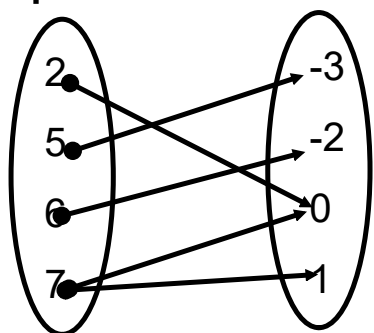
Range

The set of second elements:

{

}

Input Output



This is an arrow diagram. Follow the arrows to write the set of ordered pairs.

The set of ordered pairs is

There are two types of graphs and data

Discrete and Continuos Data

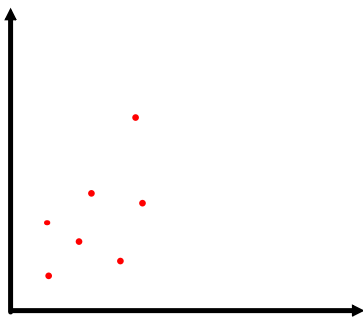
Discrete Data

- points are not joined together with a line on the graph.
- A finite number of values exist between points
- hint ask yourself can you have part of a "x" value. If no then discrete

Continuous Data

- points are joined together with a line on the graph.
- A infinite number of values exist between points
- hint ask yourself can you have part of a "x" value. If yes then continuous

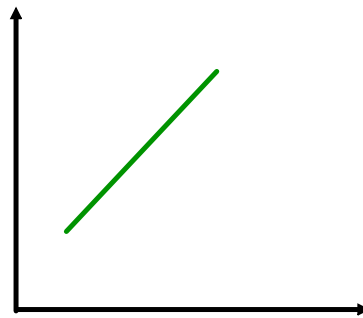
Examples)



Discrete

with dots then

$$\left. \begin{array}{l} x \in W \\ x \in I \\ x \in N \end{array} \right\} \begin{array}{l} y \in W \\ y \in I \\ y \in N \end{array}$$



Continuous

with line

$$\begin{array}{l} x \in R \\ y \in R \end{array}$$

Review from Grade 6 & 8

For Word Problems Ask yourself

"Can you have part of the data on the x axis or the y axis?"

If yes ,then it is continuous.

If no, then discrete

Examples:

1) Remember the example graphing the number of people at a dance between 9 and 10 o'clock

2) Graphing the temperature of a lake from 7:00 pm to 7:00 am

Linear & Non-Linear

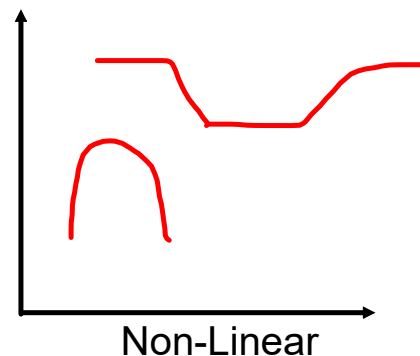
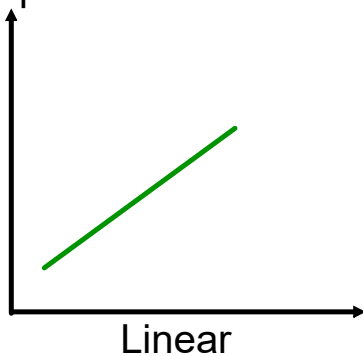
Linear graphs - the data is a single straight line
(Doesn't have to be connected)

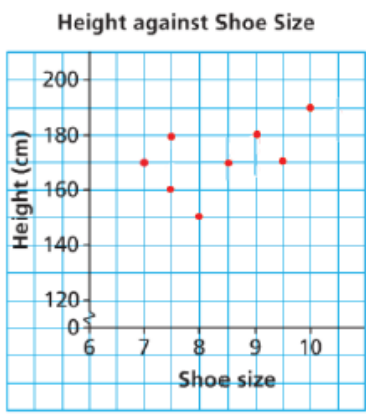


Non-Linear graphs - the data is NOT a straight line
- It can curve or spread out with no real pattern.



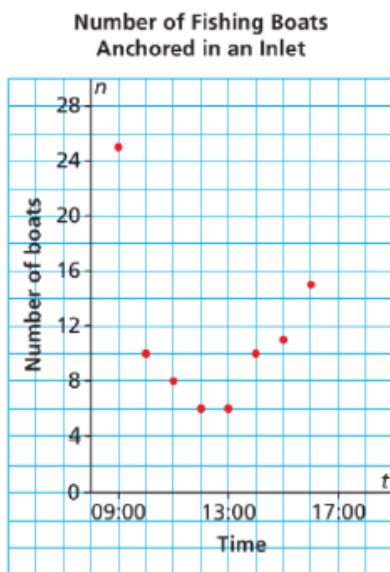
Examples





a) State the domain & range.

b) Why are the points not connected? Explain.



a) State the domain & range.

b) Why are the points not connected? Explain



How do you state the
Domain & Range?

When connected lines

How to write Range

$$\{y \mid \square \leq y \leq \square, y \in \square\}$$

How to write Domain

$$\{x \mid \square \leq x \leq \square, x \in \square\}$$

You can use this for dots as well as using as you say $x \in I$

How to write Range

$$\{y \mid \square \leq y \leq \square, y \in I\}$$

How to write Domain

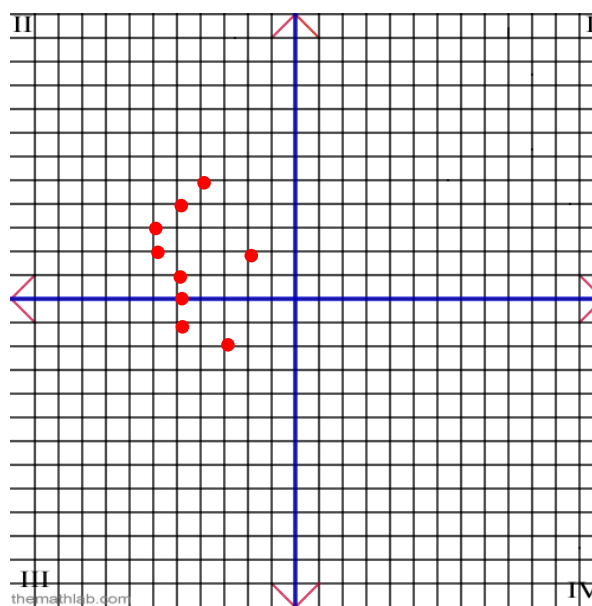
$$\{x \mid \square \leq x \leq \square, x \in I\}$$

↘ I will use this

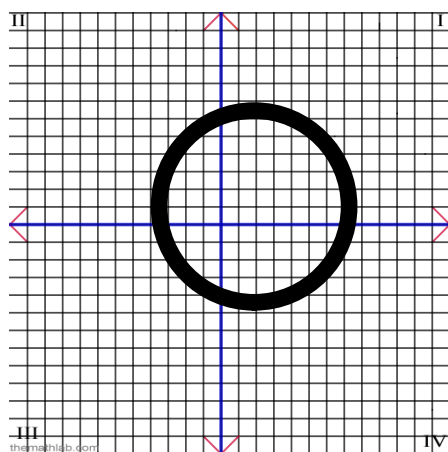
or you can list as a set

Domain $\{-6, -5, -4, -3, -2\}$

Range: $\{-2, -1, 0, 1, 2, 3, 4, 5\}$



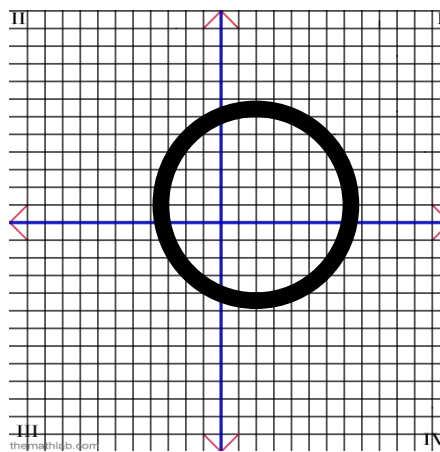
Domain



The **domain** represents all the values of x .

X is the independent Variable

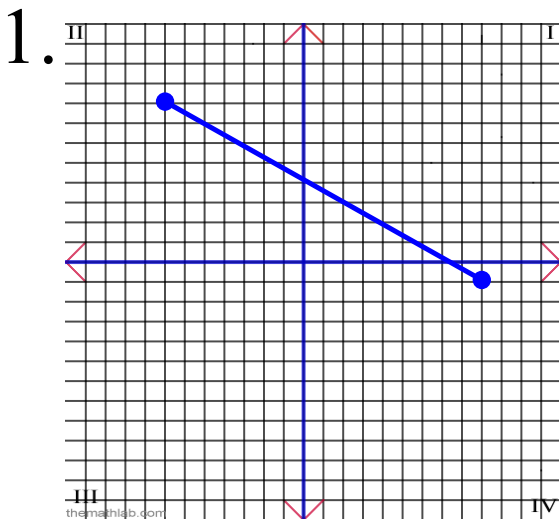
Range



The **range** represents all the values of y .

Y is the dependent Variable

EXAMPLES!

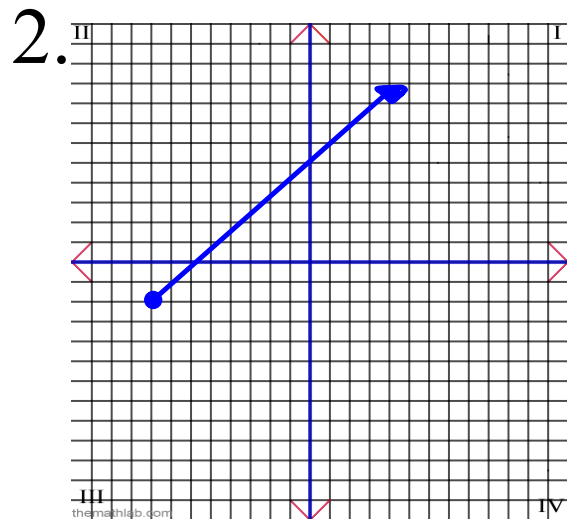


Domain: $\{x \mid \underline{\quad} \leq x \leq \underline{\quad}, x \in \underline{\quad}\}$

Range: $\{y \mid \underline{\quad} \leq y \leq \underline{\quad}, y \in \underline{\quad}\}$

Is it continuous or discrete?

Is it linear or non linear?



Domain: $\{x \mid \underline{\quad} \leq x \leq \underline{\quad}, x \in \underline{\quad}\}$

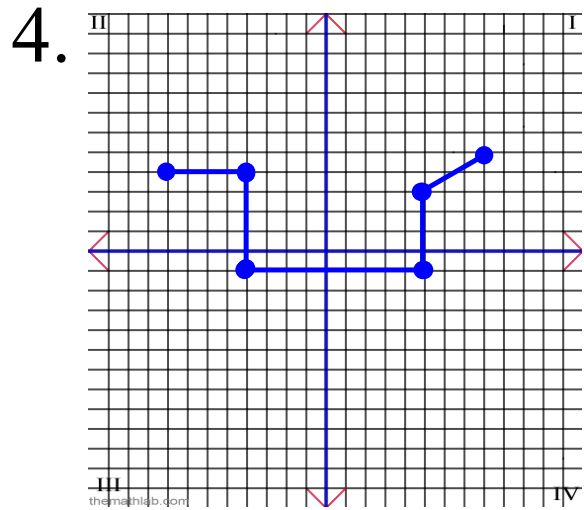
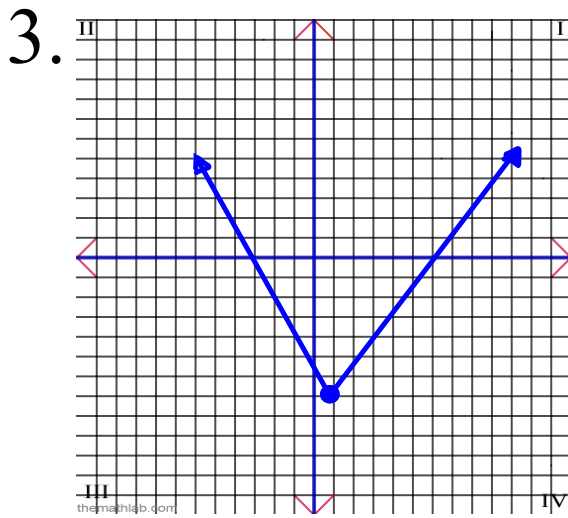
Range: $\{y \mid \underline{\quad} \leq y \leq \underline{\quad}, y \in \underline{\quad}\}$

Is it continuous or discrete?

Is it linear or non linear?



EXAMPLES!



Domain:

Range:

Is it continuous or discrete?

Is it linear or non linear?

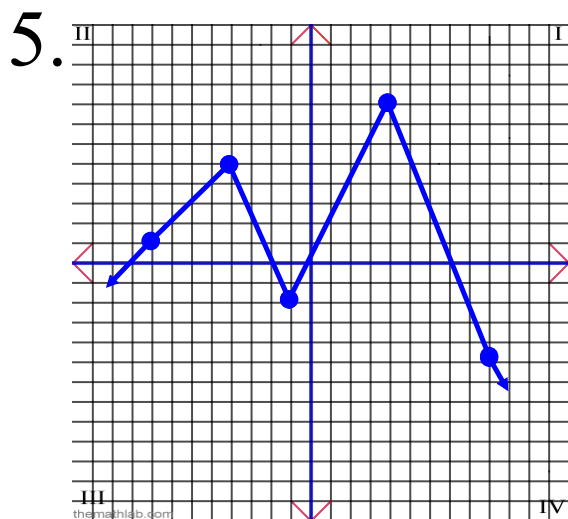
Domain:

Range:

Is it continuous or discrete?

Is it linear or non linear?

EXAMPLES!



Domain: $\{x \mid -2 \leq x \leq 4\}$

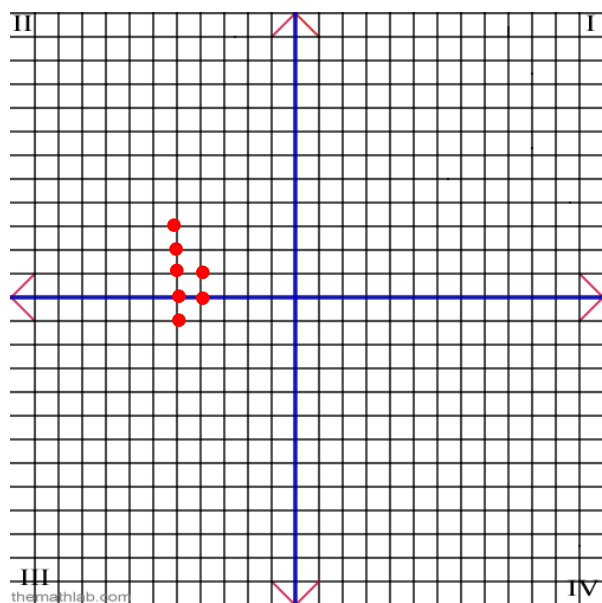
Range: $\{y \mid 0 \leq y \leq 4\}$

Is it continuous or discrete?

Is it linear or non linear?

EXAMPLES!

7.



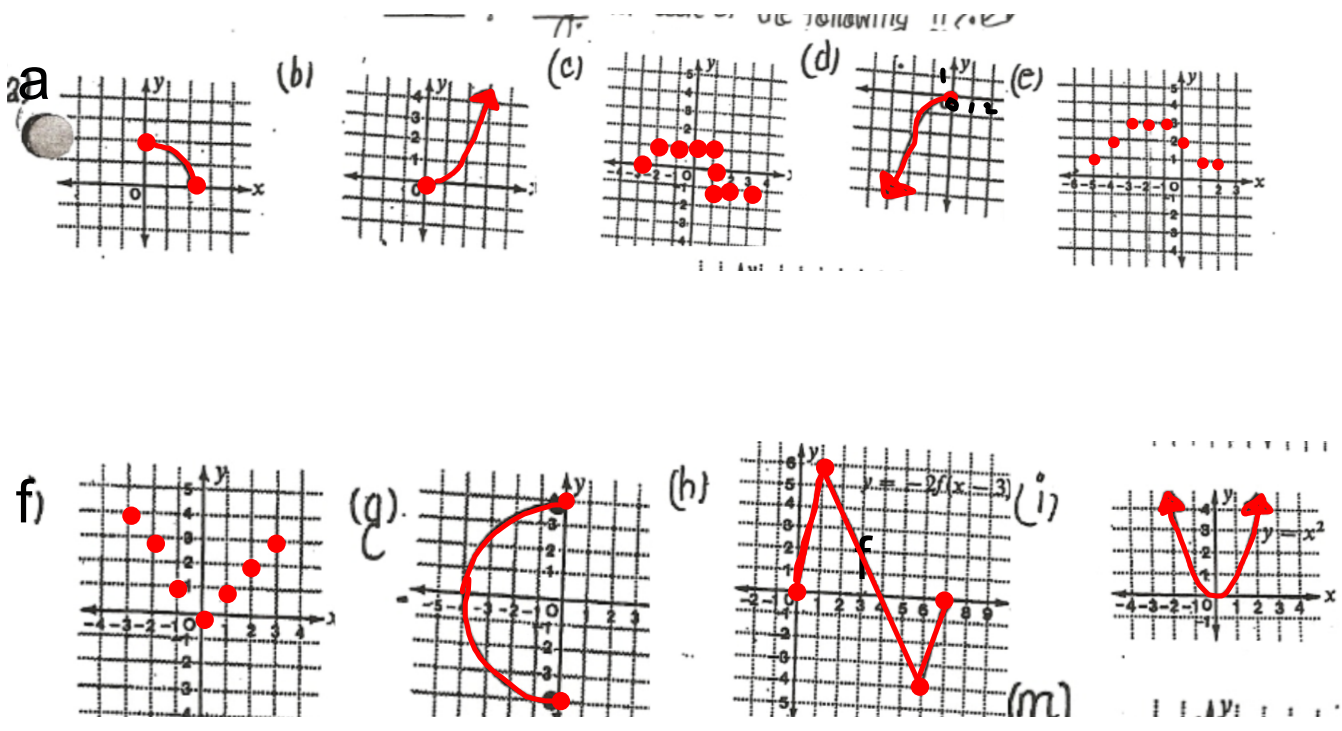
Domain: $\{-3, -2\}$

Range: $\{1, 2, 3, 4\}$

Is it continuous or discrete?

Is it linear or non linear?

Class/Homework Write the domain, range, is it continuous or discrete, and is linear or nonlinear.



Class/Homework

Write the domain, range, is it continuous or discrete, and is linear or nonlinear.

