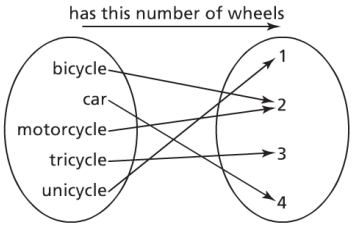
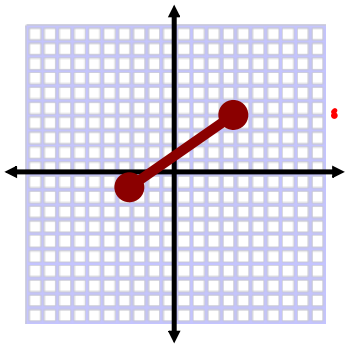
Properties of a Function

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



(apple, red)
(banana, yellow)
(grape, purple)

(4,7)
(9,5)
(11,13)

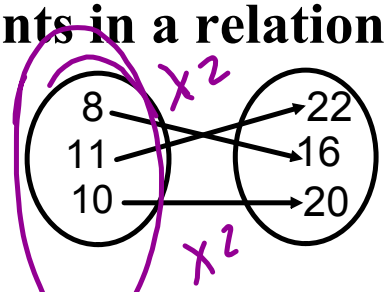


Domain & Range

Domain - the set of first elements in a relation

Animal	Number of legs
Duck	2
Horse	4

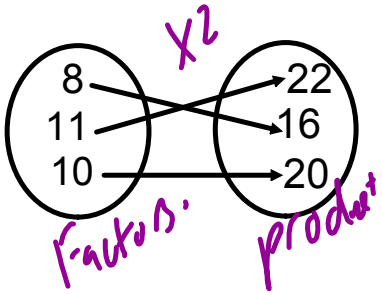
(apple, red)
(banana, yellow)
(grape, purple)



Range - the set of second elements in a relation

Animal	Number of legs
Duck	2
Horse	4

(apple, red)
(banana, yellow)
(grape, purple)



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

Domain

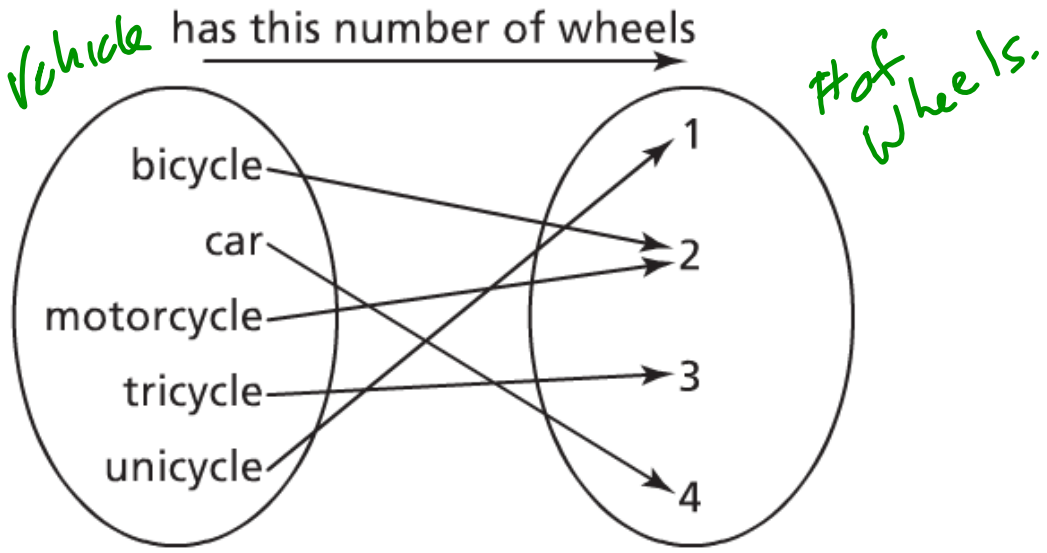
Range

First **Second**

(Sport, Equipment)

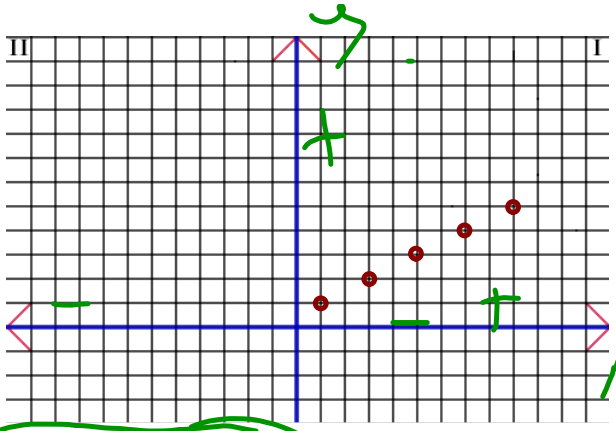
Domain The set of first elements:
{ badminton, hockey, tennis, soccer}

Range The set of second elements:
{ shuttlecock, racquet, puck, stick, ball}



Domain The first set of elements:
{bicycle, car, motorcycle, tricycle, unicycle}

Range The second set of elements:
{1, 2, 3, 4}



Remember!!

(x , y)

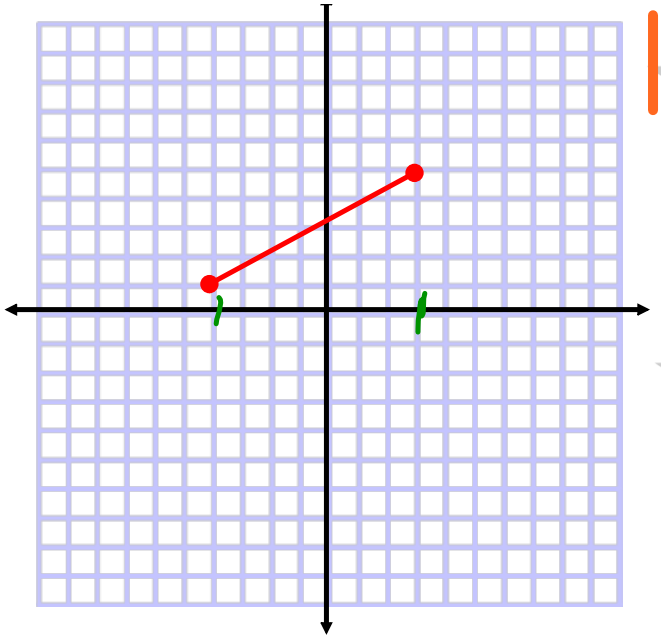
Ordered Pairs:

1st 2nd 1st 2nd 1st 2nd 1st 2nd 1st 2nd

{ (1,1) , (3, 2) , (5, 3) , (7, 4) , (9, 5) }

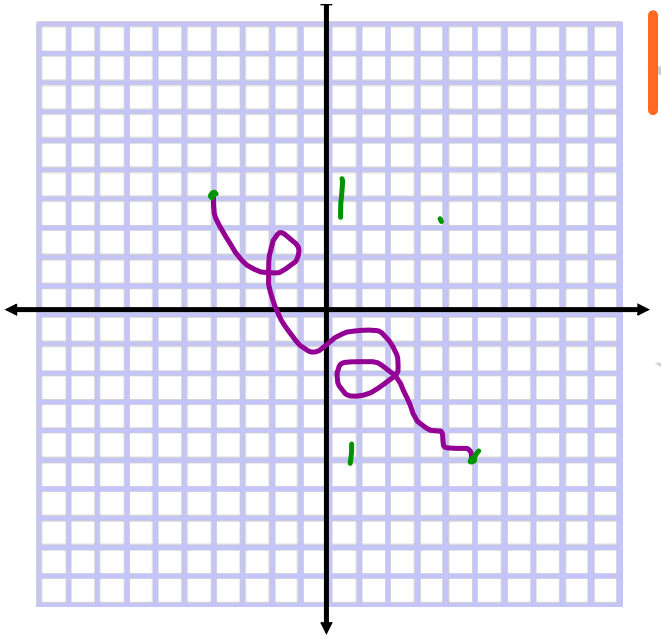
Domain The set of first elements: { 1, 3, 5, 7, 9}

Range The set of second elements: { 1, 2, 3, 4, 5}



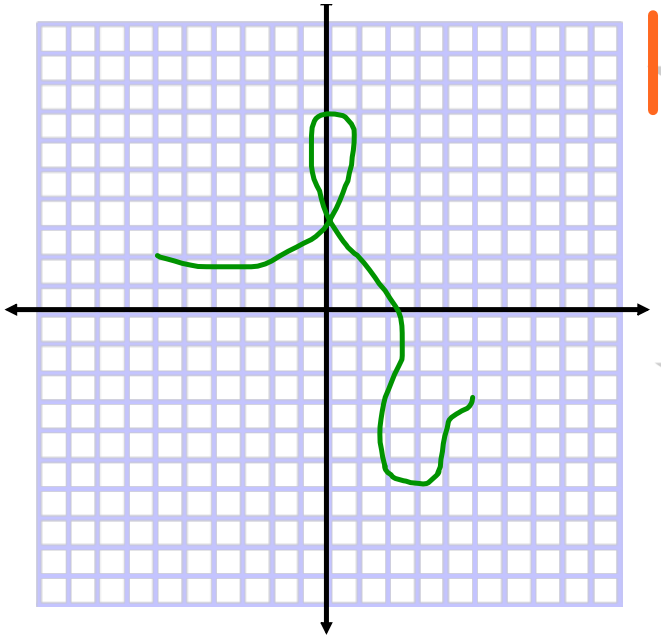
Domain Min = -4
Max = +3
$\{x \mid -4 \leq x \leq 3, x \in R\}$

Range Min = 1
Max = 5
$\{y \mid 1 \leq y \leq 5, y \in R\}$



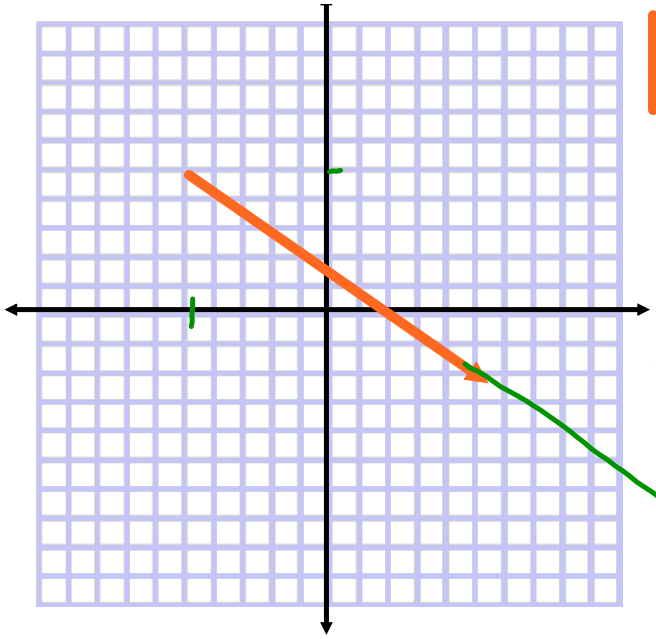
Domain Min = -4
Max = 5
$(x \mid -4 \leq x \leq 5, x \in \mathbb{R})$

Range Min = -5
Max = 4
$(y \mid -5 \leq y \leq 4, y \in \mathbb{R})$



Domain

Range



Domain

x

$\text{Min} = -5$

$\text{Max} = +\infty$

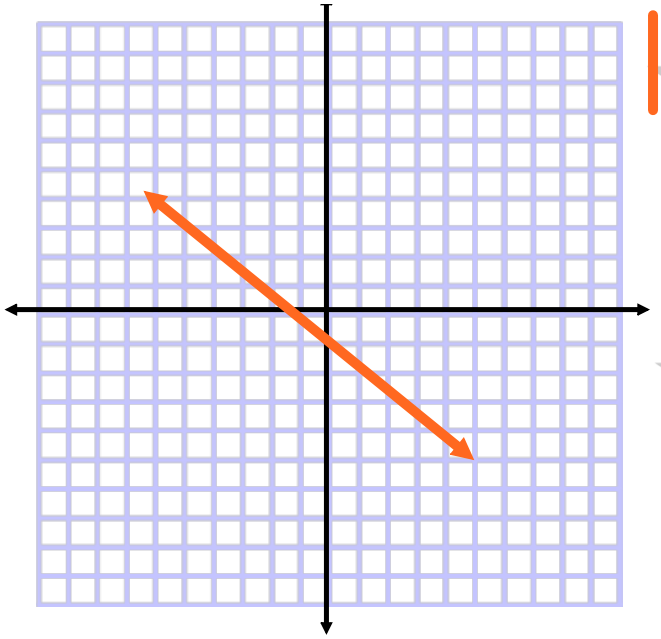
$\{x \mid -5 \leq x < +\infty, x \in \mathbb{R}\}$

Range

y

$\text{Max} = +5$

$\{y \mid -\infty < y \leq 5, y \in \mathbb{R}\}$



Domain

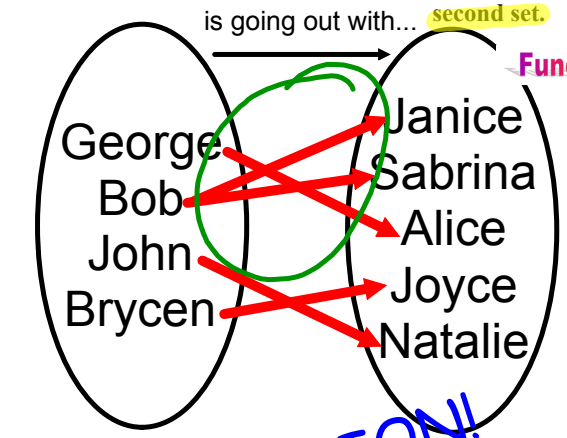
Range

Function or Nonfunction

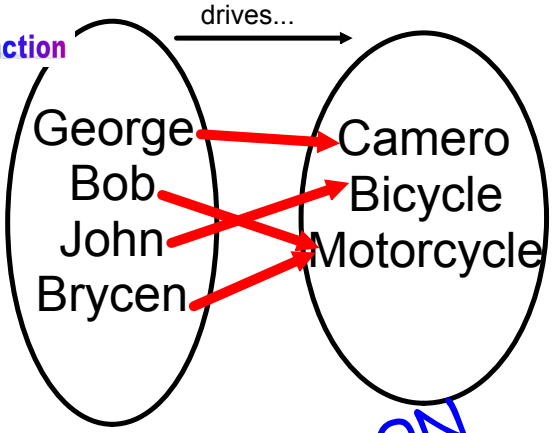
A relation where each element in the first set is associated with one and only one element in the second set.

A relation where each element in the first set is associated with one and only one element in the second set.

Function or Nonfunction



NONFUNCTION!



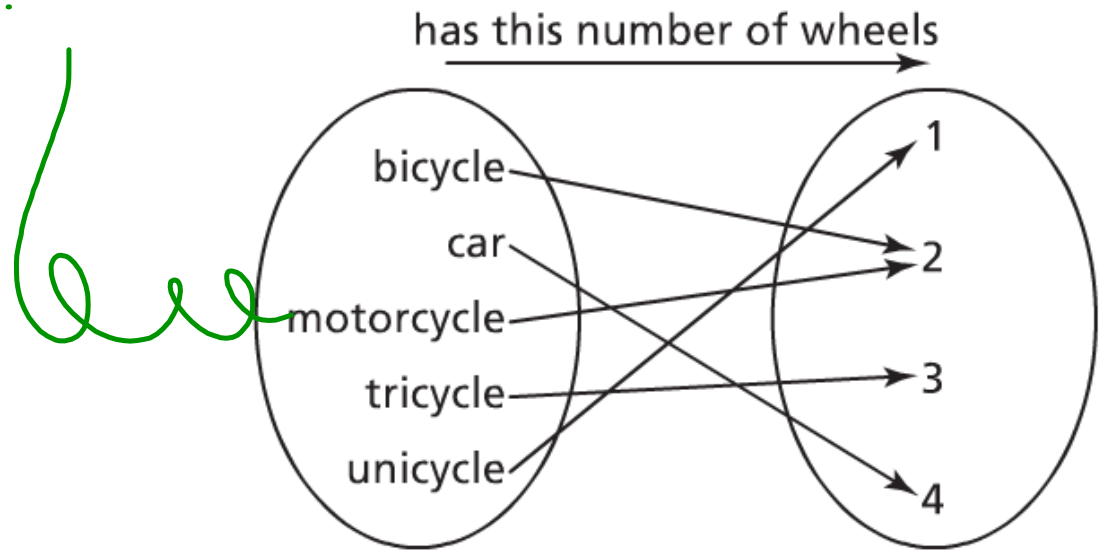
FUNCTION

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

Hi Lobban!

Function.

Function or Nonfunction

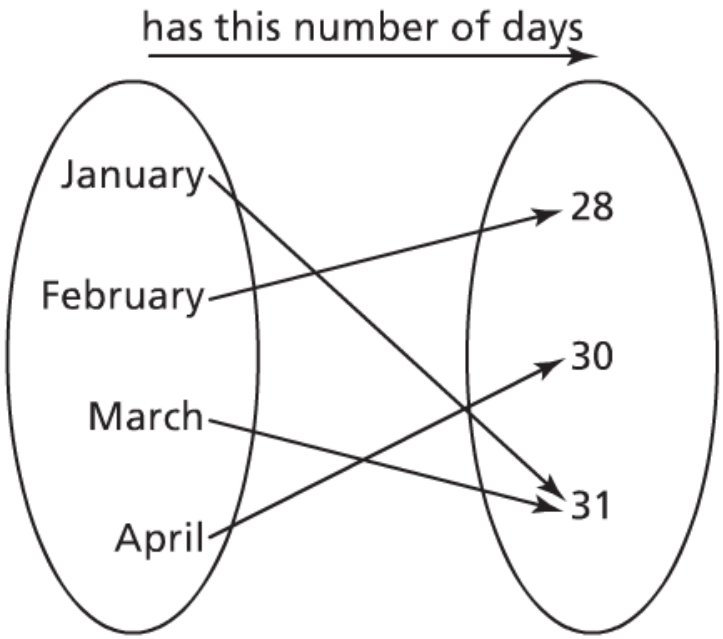


Function or Nonfunction

Not a function. Looking for Repeating x's.

$$\{ (2, 5), (3,7) , (4, 2) , (2, 6) , (8,0) \}$$

Function or Nonfunction

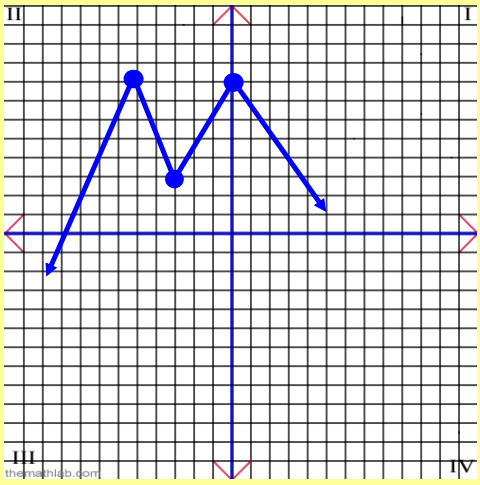


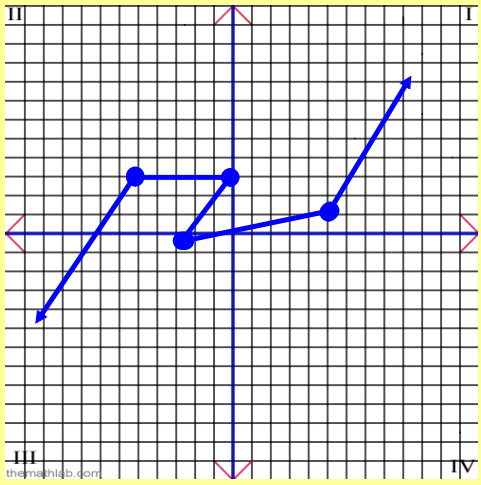
One arrow for each first element

Function or Nonfunction

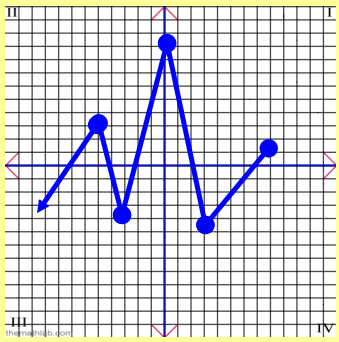
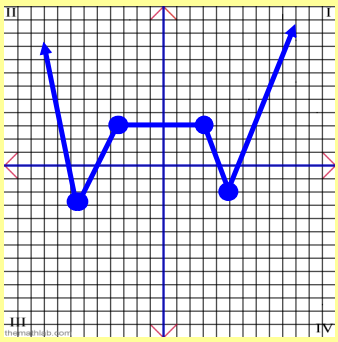
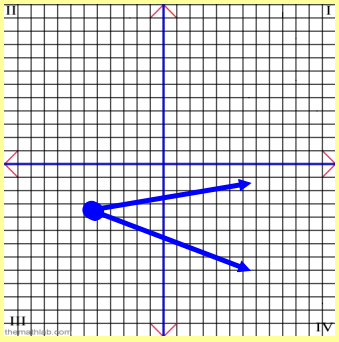
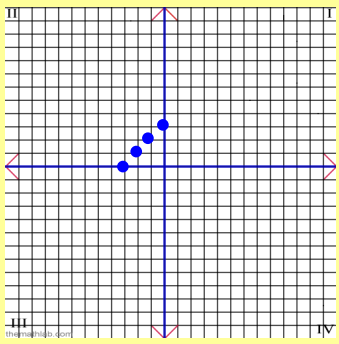
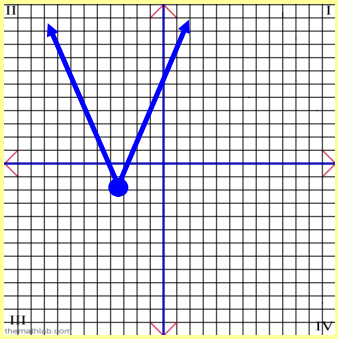
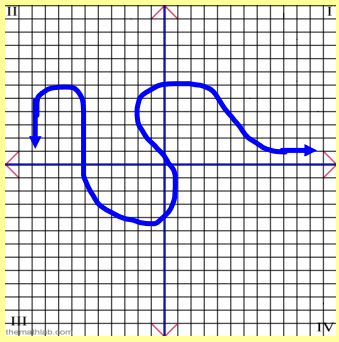
Function or Nonfunction

Use the vertical line test!!





Function or Nonfunction

Independent / Dependent

Time continues no matter what happens.

The amount of money I save depends how much I put away.

Independent / Dependent

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

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

Independent Variable

- Hours do not depend on the person's pay.

Dependent Variable

- A person's pay often depends on the number of hours worked.

Hours Worked, h	Gross Pay, P ($)
1	12
2	24
3	36
4	48
5	60

Page 270

#'s 4,6,7,8,9,

~~10,11~~,14,15,16

Hours Worked, h	Gross Pay, P ($)
1	12
2	24
3	36
4	48
5	60

Let's write the function notation

$$P(h) = 12h$$

What is the person's pay after 20 hours? P(20)

$$P(20) = 12(20)$$
$$= \$240$$

Function Notation...

4.3

$c(x) = 5x - 2$

$a(x) = 20 - x$

$t(x) = 3x + x$

Evaluate:

t(7)

$t(7) = 3(7) + 7$

$t(7) = 21 + 7$

$t(7) = 28$

$x = 7 \quad y = 28$

$c(x) = 153$

$c(x) = 5x - 2$

$2 + 153 = 5x - 2 + 2$

$\frac{155}{5} = \frac{5x}{5}$

$x = 31$

c(11)

$c(x) = 5x - 2$

$c(11) = 5(11) - 2$

$c(11) = 55 - 2$

$c(11) = 53$

$x = 11 \quad y = 53$

Number of Marbles, n	Mass of Marbles, m (g)
1	1.27
2	2.54
3	3.81
4	5.08
5	6.35
6	7.62

a) State the domain & Range.
b) Is this relation a function?
c) State the dependent and independent variables.
d) Write the function notation.

Solution:

a) Domain: { 1, 2, 3, 4, 5 }
Range: {1.27, 2.54, 3.81, 5.08, 6.35, 7.62}

b) Function

c) Independent - number of marbles
Dependent - Mass

d) C(n) = 1.27 n