

Properties of a Function

Domain & Range

Domain - the set of first elements in a relation

Range - the set of second elements in a relation

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

First

Second

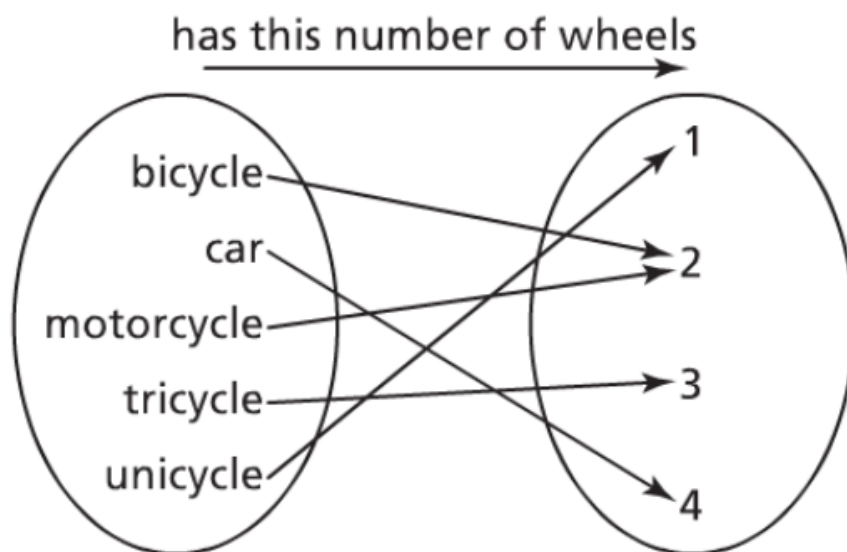
(**Sport, Equipment**)

Domain

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

Range

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

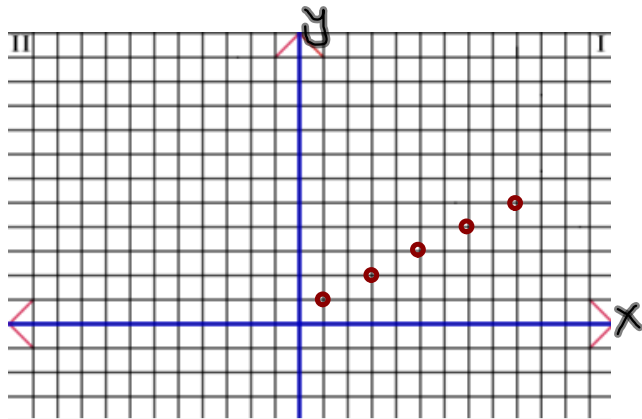


Domain

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

Range

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



Remember!!
 across up/down
 (X , y)

Ordered Pairs:

$$\left\{ \begin{array}{cc} \text{1st} & \text{2nd} \\ \swarrow & \searrow \\ (1, & 1) \end{array} , \begin{array}{cc} \text{1st} & \text{2nd} \\ \swarrow & \searrow \\ (3, & 2) \end{array} , \begin{array}{cc} \text{1st} & \text{2nd} \\ \swarrow & \searrow \\ (5, & 3) \end{array} , \begin{array}{cc} \text{1st} & \text{2nd} \\ \swarrow & \searrow \\ (7, & 4) \end{array} , \begin{array}{cc} \text{1st} & \text{2nd} \\ \swarrow & \searrow \\ (9, & 5) \end{array} \right\}$$

Domain

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

Range

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

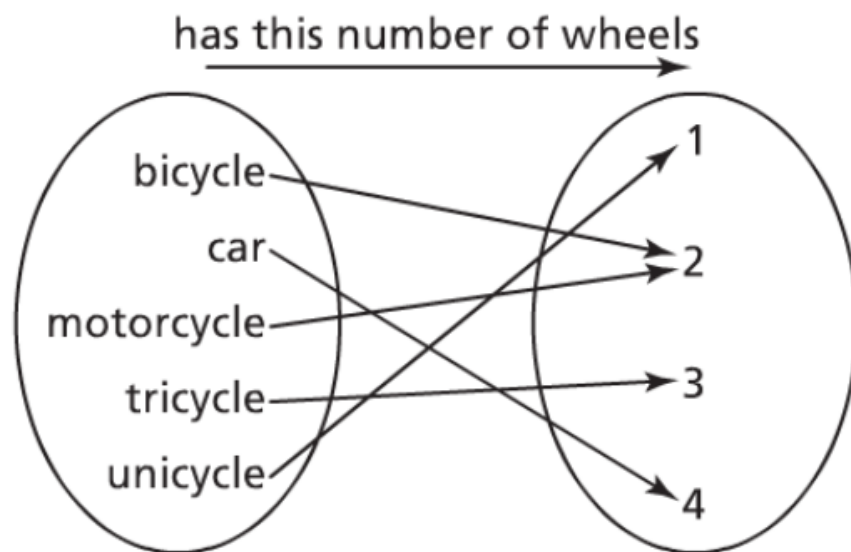
Function or Nonfunction

Function:

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

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

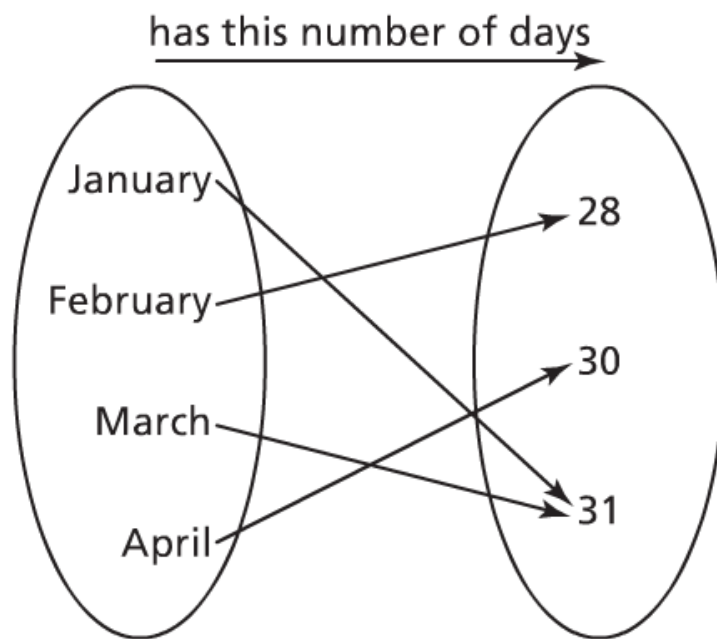
Function or Nonfunction



Function or Nonfunction

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

Function or Nonfunction



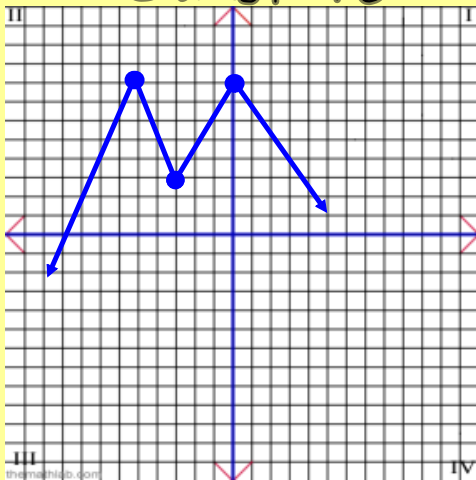
Function or Nonfunction

Function or Nonfunction

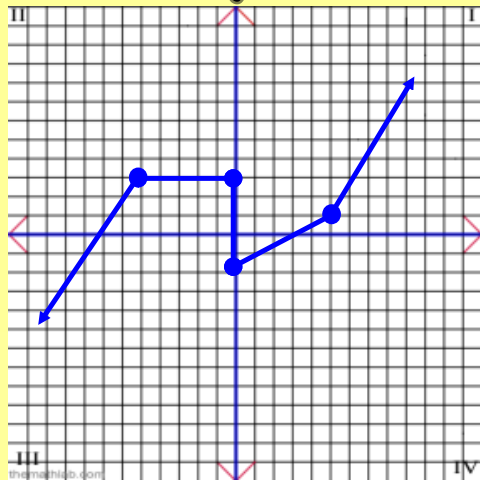


Use the vertical line test!!

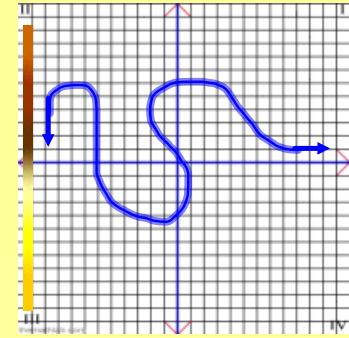
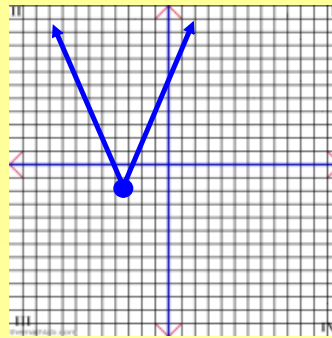
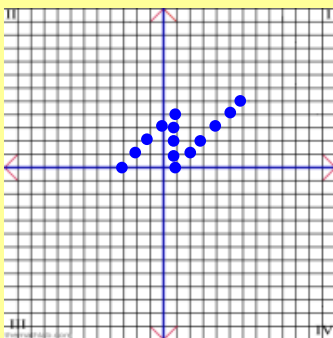
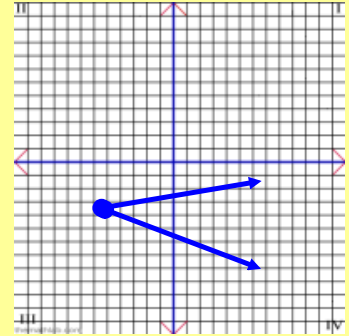
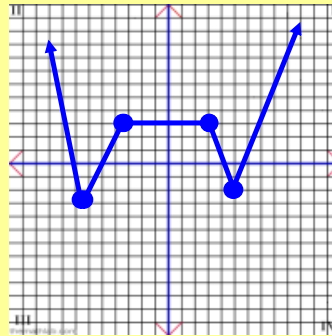
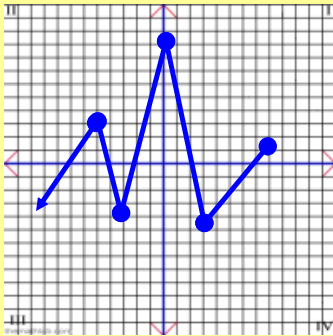
Function



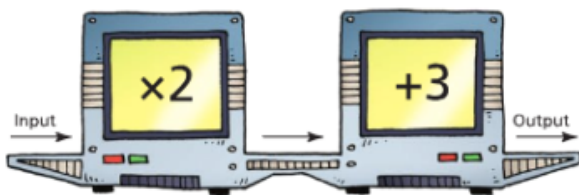
NonFunction



Function or Nonfunction



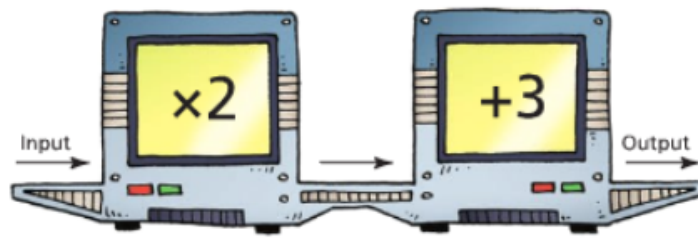
Input/Output



Input	Output
1	5
2	7
	9
4	
	13

What is the rule for the input/output machine?

**Multiply the input number by 2, then add 3,
which equals the output number.**



Complete the table:

Input	Output
1	5
2	7
3	9
4	11
5	13

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.



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

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

Let's write the function notation

$$P(h) = 12h$$

What is the person's pay after 20 hours?

$$P(20) = 12(20)$$

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

Try This!!

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

- State the domain & Range.
- Is this relation a function?
- State the dependent and independent variables.
- Write the function notation.

Solution:

- a) Domain: { 1, 2, 3, 4, 5 }**
Range: { 1.75, 3.50, 5.25, 7.00, 8.75 }
- b) Function**
- c) Independent - number of tickets**
Dependent - Cost
- d) $C(n) = 1.75 n$**

