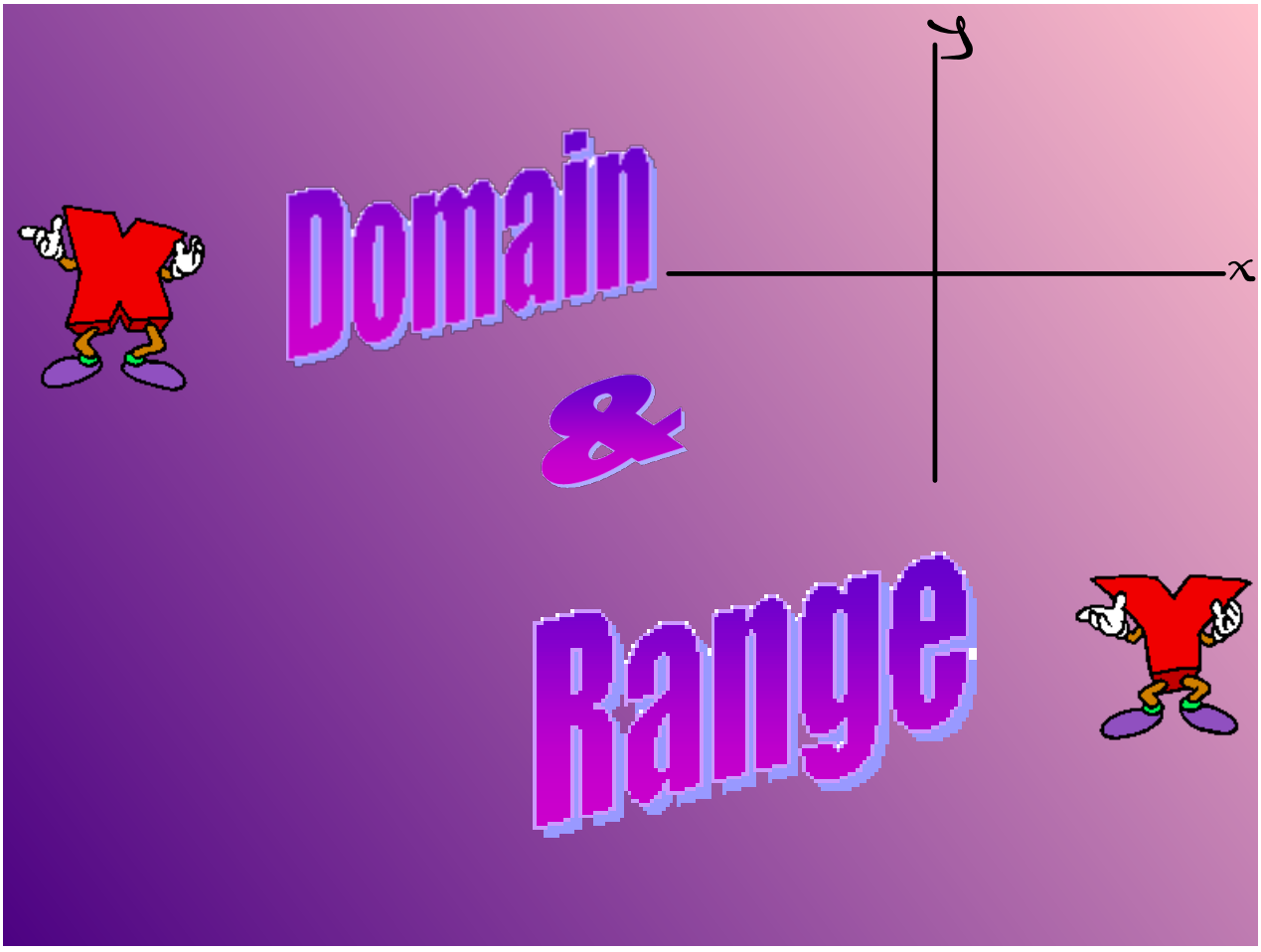
Review from last day...

Ways to represent relations

Representing Relations

What are some of the most common means of describing mathematical relations?

(1) Verbally
(2) Ordered Pairs
(3) Table of Values
(4) Arrow Diagram
(5) Graph
(6) Equation



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**

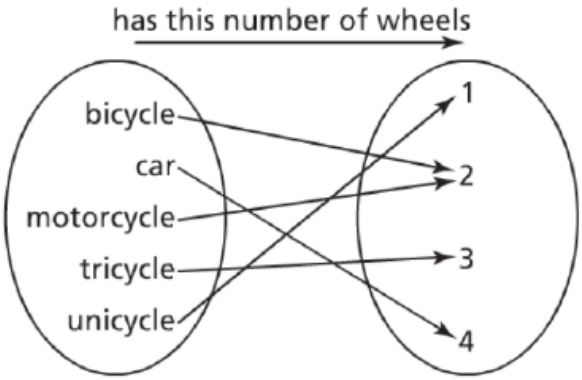
(Sport, Equipment)

Domain

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

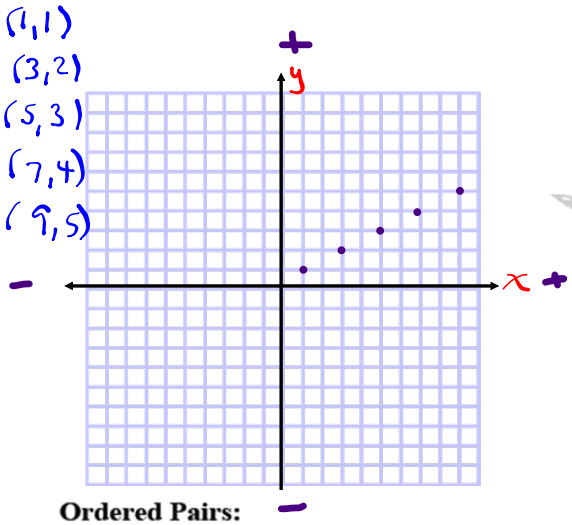
Range

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) }

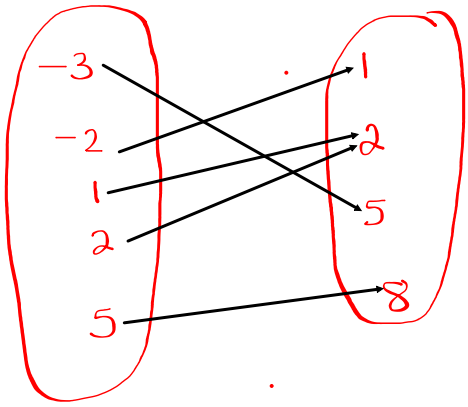
Domain The set of first elements: { 1, 3, 5, 7, 9}

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

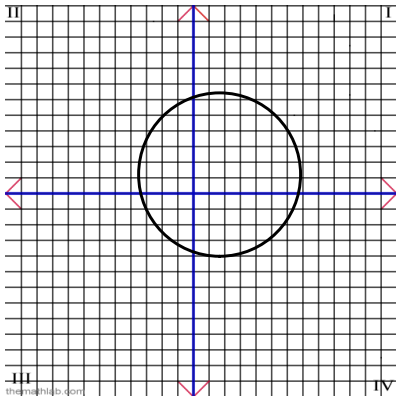
$\{(2,2)\ (1,2)\ (-3,5),\ (-2,1)\ ,(5,8)\}$

Domain : $\{-3,-2,1,2,5\}$

Range : $\{1,2,5,8\}$



Domain ||

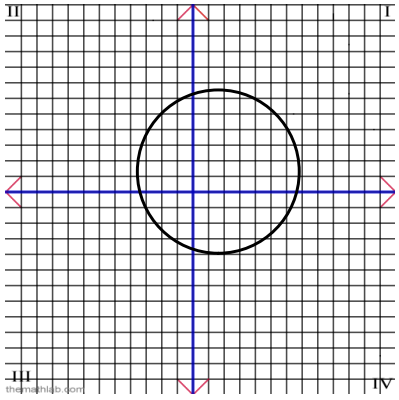


The **domain** represents all the values of x.

$\{-3.5 \leq x \leq 7\}$

X is the independent Variable

Range ____



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

$\{-4 \leq y \leq 6.5\}$

Y is the dependent Variable

What is the independent variable...x or y?

$y = x + 3$

$= (21) + 3$

$= 24$

x is independent

y is dependent

MATH 10

OCTOBER 30, 2017

FUNCTIONS

1min

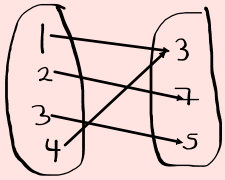
Relations VS Functions

- a relation is where a pattern/relationship exists between the independent variable (x) and the dependent variable(y).

- a function is a special relationship where...
"each x has one and only one y value".

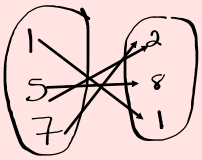
{(1, 3) (2, 7) (3, 5) (4, 7)}

1)



function

2)



(1, 1) (5, 2) (5, 8)

(7, 1)

Nonfunction
(five has 2 answers)

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.

Function

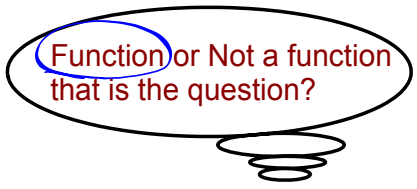
Functions

- How can I tell from a set of points/table?

"an x value has more than one y value"

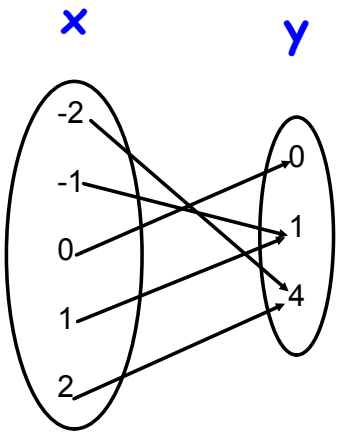
- a function is a relation in which no two ordered pairs have the same first coordinate.

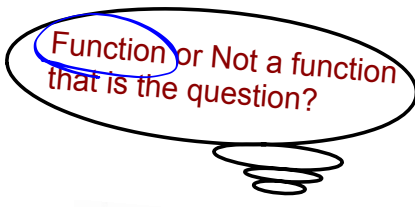
x	y
3	5
7	11
8	15
9	22



Arrow Diagrams

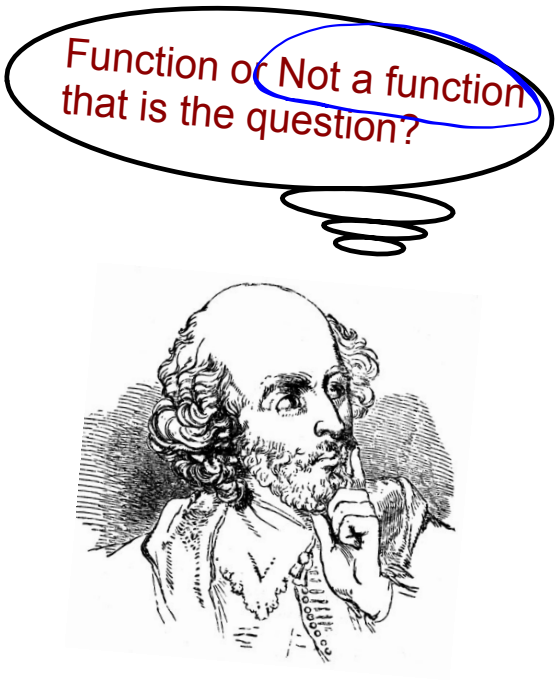
Function:
For every first element there is one and only one second element. (Only one arrow starts from each element of the domain.)

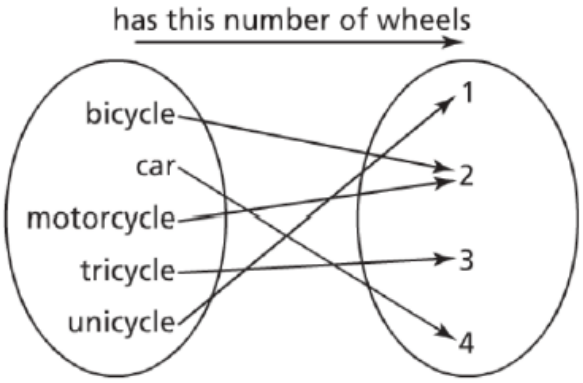


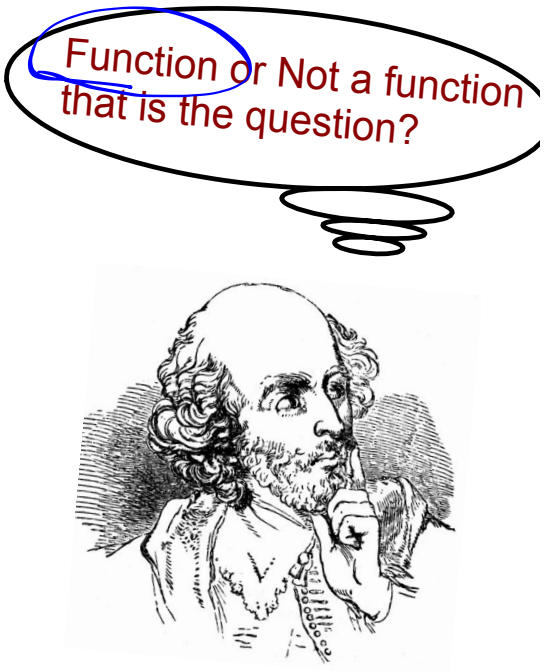


(-2, 4) , (-1, 1) (0, 0) (1, 1) (2, 4)

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

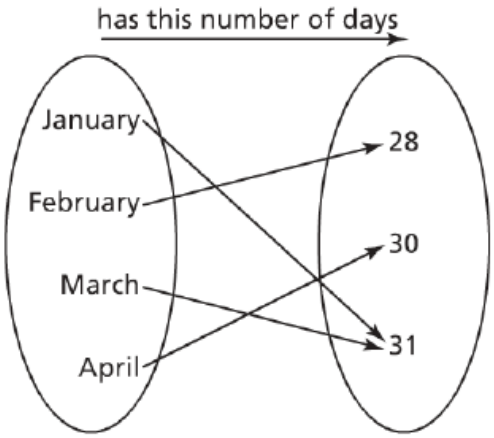






$$\{ (2, 5), (3,7) , (4, 2) , (2, 6) , (8,0) \}$$

Function or Not a function
that is the question?



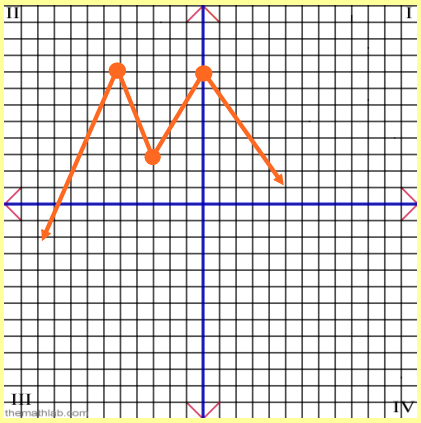
Function or Not a function
that is the question?

Function or Nonfunction

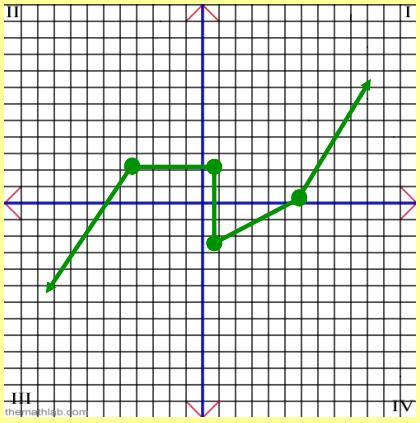
** To determine whether or not a graph is a function or nonfunction, we use what is called the vertical line test!!

** If the line crosses the graph more than once at any particular location, then it is not a function.

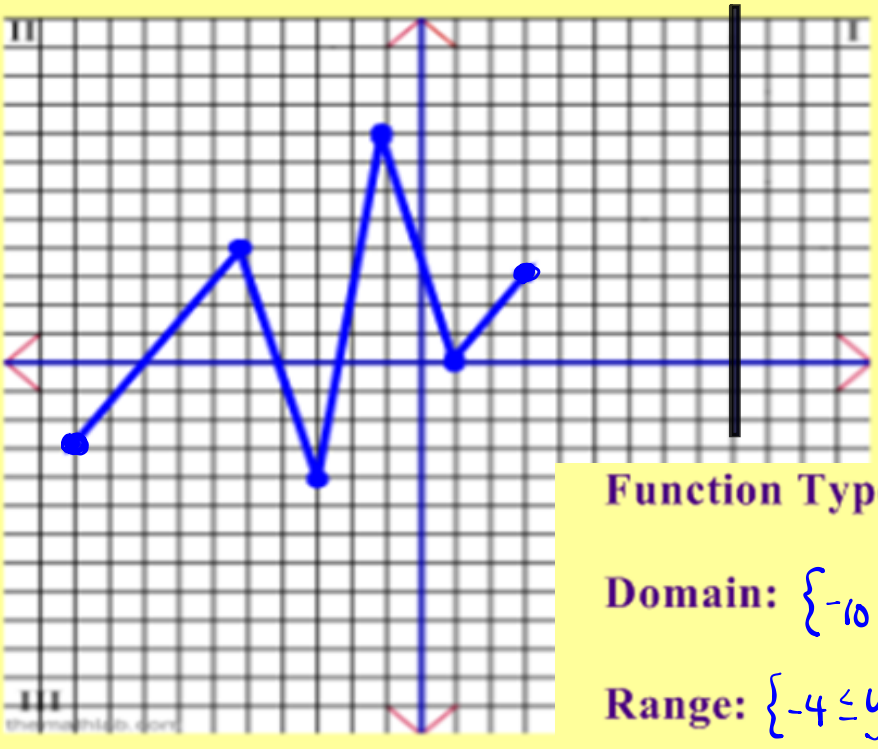
Function



Nonfunction



** State whether the graph is a function or nonfunction, as well as stating the domain & range!!

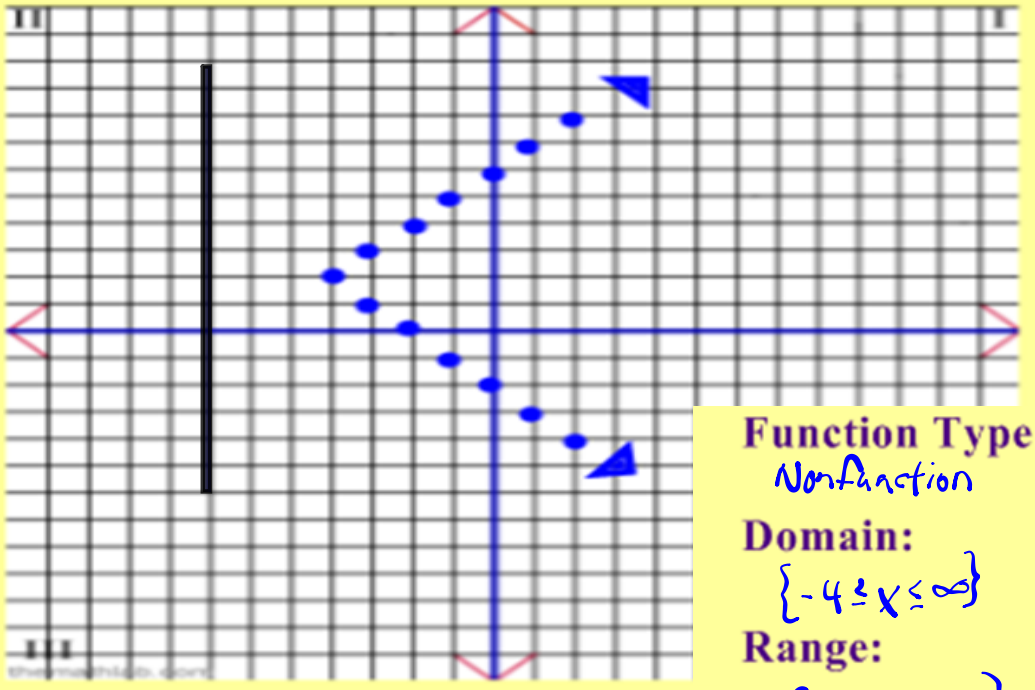


Function Type: function

Domain: $\{-10 \leq x \leq 3\}$

Range: $\{-4 \leq y \leq 8\}$

* State whether the graph is a function or nonfunction, as well as stating the domain & range!!

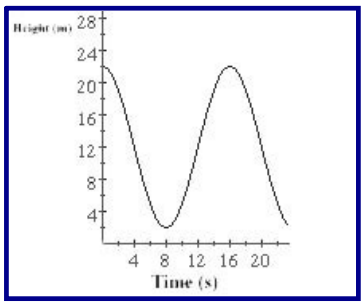


Function Type:
Nonfunction

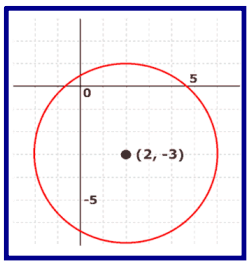
Domain:
$\{-4 \leq x \leq \infty\}$

Range:
$\{-\infty \leq y \leq \infty\}$

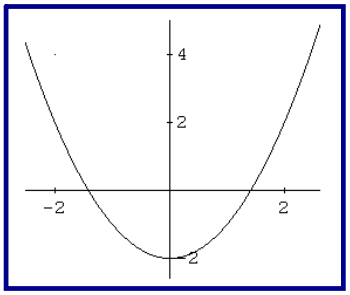
Use the Vertical Line Test to see if the graph is a function



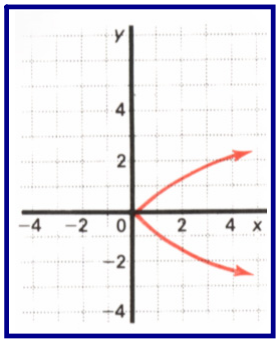
function



Nonfunction

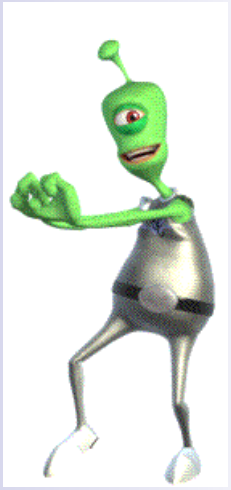


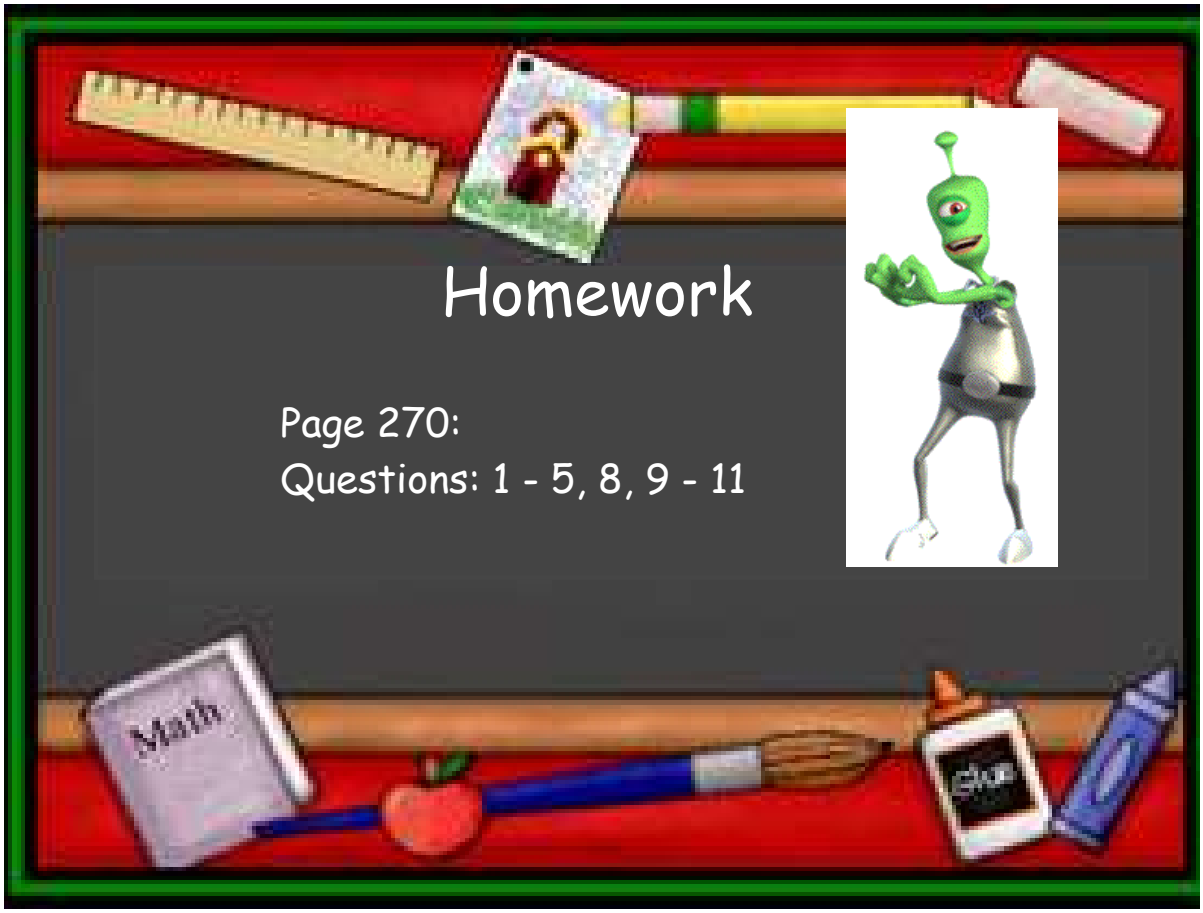
function



Nonfunction

Graphs are so EASY





5. a) function

$D = \{1, 2, 3, 4\}$

$R = \{3, 6, 9, 12\}$

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

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

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

Solution:

to page 267 check understanding

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

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

See page 267

Let's write the function notation

$$P(h) = 12h$$

What is the person's pay after 20 hours?

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