Domain & Range

Domain - the set of first elements in a relation

"x-values"

Range - the set of second elements in a relation

"y-values"

EXAMPLE...

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

First Second

(Sport, Equipment)

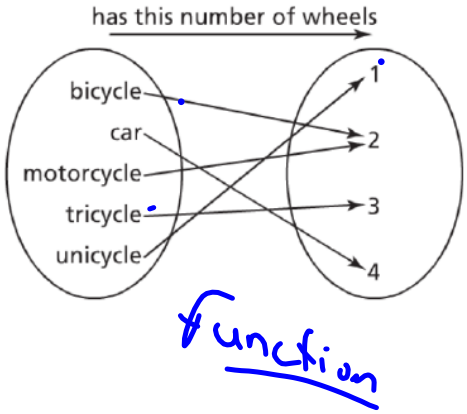
Domain — The set of first elements:
{ badminton, hockey, tennis, soccer}

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

Set Brackets

{

EXAMPLE... Arrow Diagram



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

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

Domain?

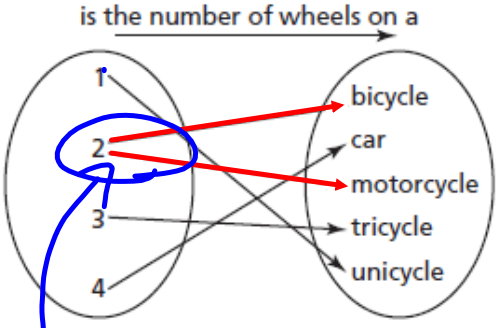
Range?

Properties of Functions

Function - is a special relation where...
- each element in the domain is associated with exactly one element in the range
- each value of x has "one and only one" y value.

A function is a "well-behaved" relation !!!

EXAMPLE... This relation associates a number with a vehicle with that number of wheels.



Not a function

What is the domain?

{1, 2, 3, 4}

What is the range?

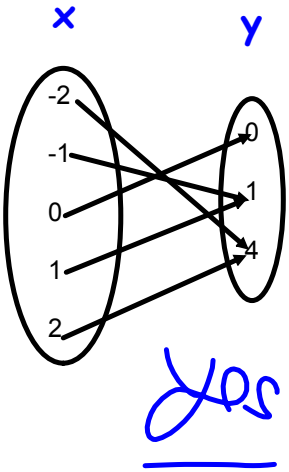
{bicycle, car, mot., tri., uni.}

Is this relation a function?

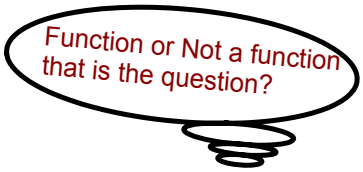
No

Arrow Diagrams

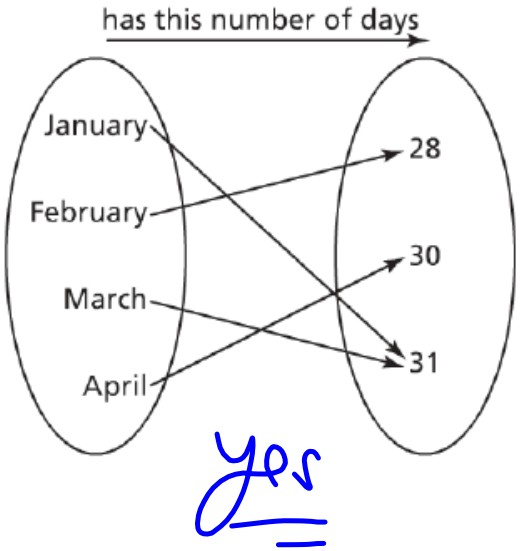
Function: For every first element there is one and only one second element.
(Only one arrow starts from each element of the domain)



Yes



YOUR TURN...

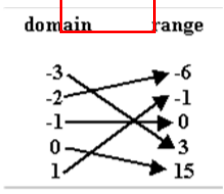


yes

Function or Not a function that is the question?

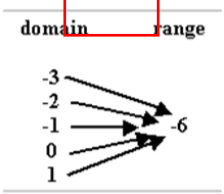
Would any of these be functions???

A



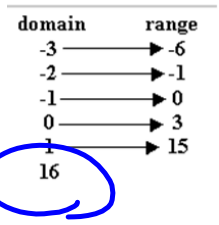
Yes

B



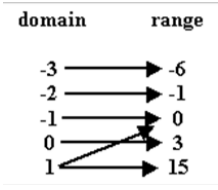
Yes

C



No

D



No

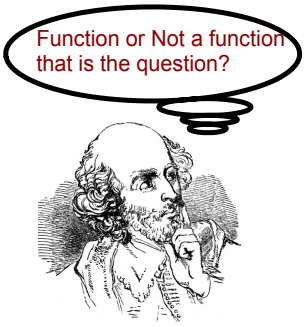
- How can I tell from a set of points/table?

"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

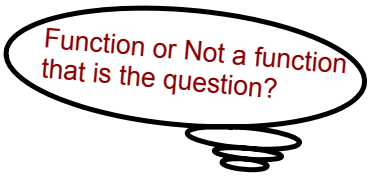
Yes



What about a table?

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

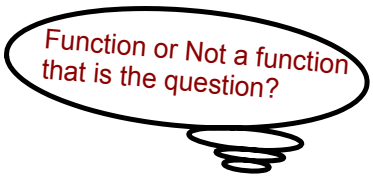
No



What about a set of ordered pairs?

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

Not



LET'S TRY THIS ONE...

- State the domain and range of the following relation. Is the relation a function?
  {(2, –3), (4, 6), (3, –1), (6, 6), (2, 3)}

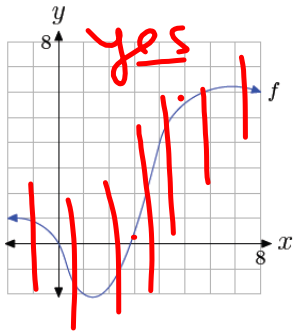
Domain: {2, 3, 4, 6}

Range: {-3, 6, -1, 3}

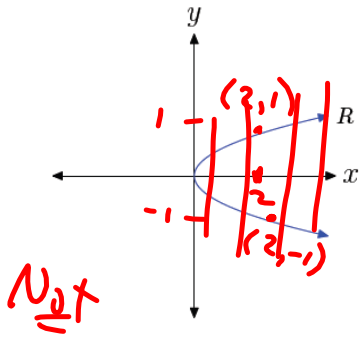
Not a function

What if we are provided a graph?

Would this be a function?



How about this one?



See any quick way to determine if a graph is a function?

The Vertical Line Test. If any vertical line cuts the graph of a relation more than once, then the relation is **NOT** a function.

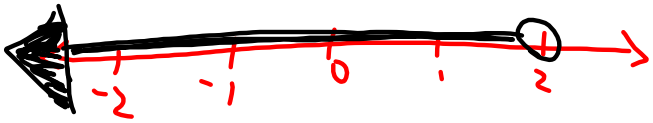
PRACTICE PROBLEMS...

p. 270: ~~#3~~ 4, 5, 8, 10, 11

Describing Sets of Numbers

$x \geq -2, x \in R$

$\in$ "is an element of"



$x < 2, x \in R$

$-3 < x \leq -1, x \in R$ $\leq$

smaller #

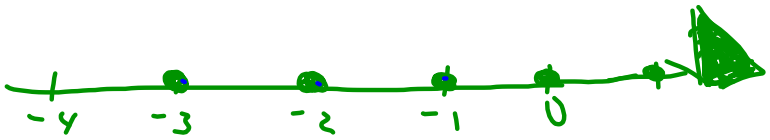
larger #

ex:

(1)

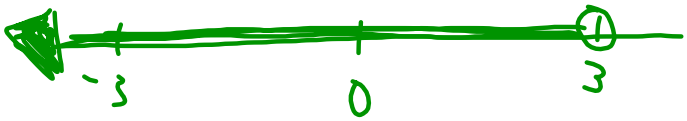
$-10 \leq x < 7, x \in R$ Real

(2)



$x \geq -3, x \in I$

(3)



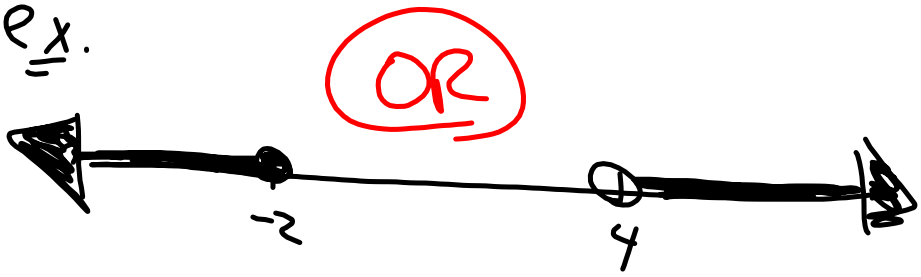
$x < 3, x \in R$

① $-3 < x \leq 5, x \in R$

② $x < 5, x \in W \{0, 1, 2, \ldots \infty\}$

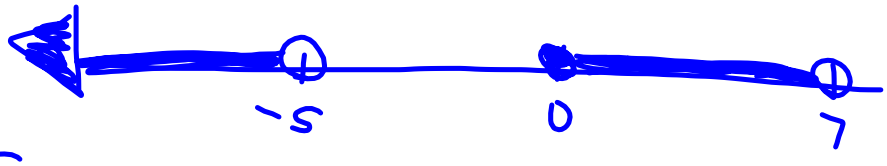
③ $-6 \leq x \leq 0, x \in R$

ex.



$x \leq -2$ OR $x > 4, x \in R$

ex.



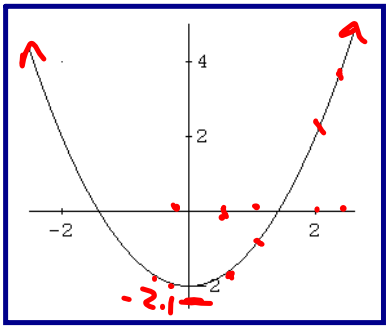
$\{x \mid x < -5$ OR $0 \leq x < 7, x \in R\}$

"x such that"

Describing the Domain and the Range

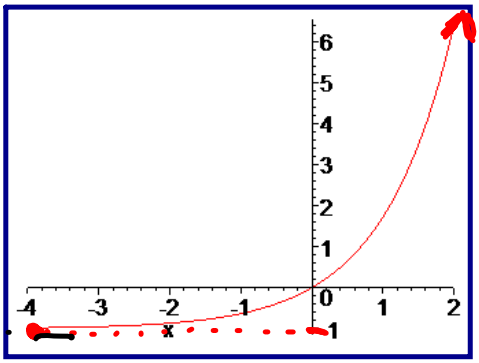
EXAMPLES: State the Domain and the Range for each of the following...

(x) (y)



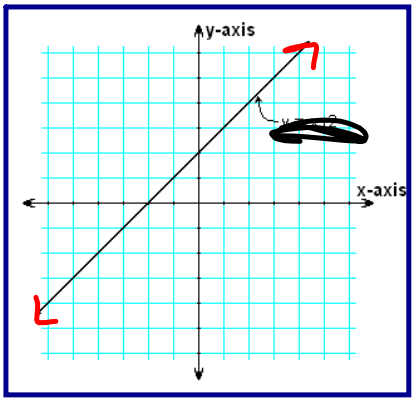
D: $\{x \in R\}$

R: $\{y \geq -2, y \in R\}$



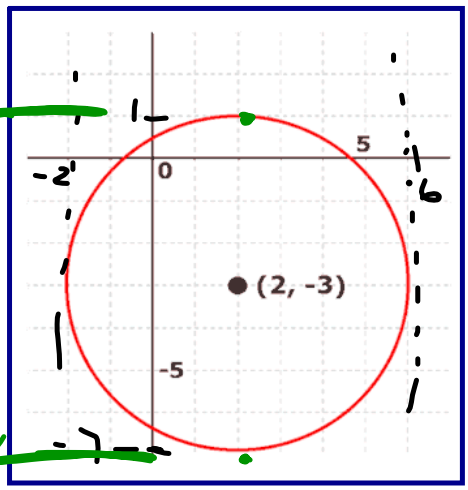
D: $\{x \geq -4, x \in R\}$

R: $\{y \geq -1, y \in R\}$



$\{D: x \in R\}$

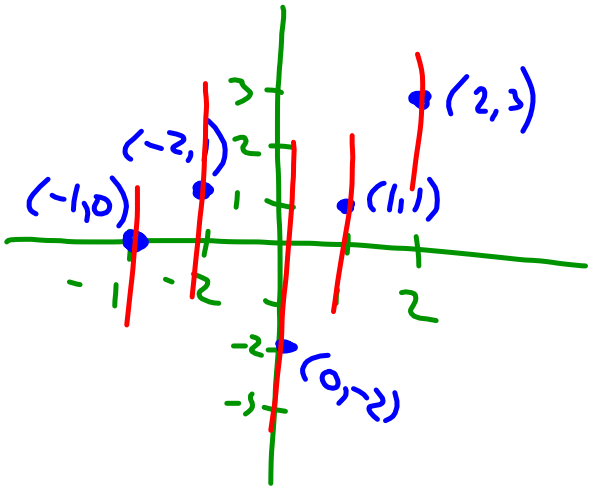
$\{R: y \in R\}$

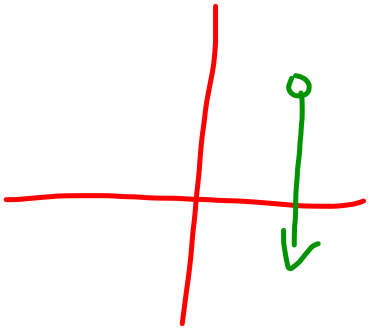


Range

$\{-2 \leq x \leq 6, x \in R\}$

$\{-5 \leq y \leq 1, y \in R\}$





1

D: {-1, -2, 0, 1, 2}

R: {-2, 0, 1, 3}

Attachments

Worksheet - Sketching Angles in Radians.doc

Warm-Up - Intro to Limits.docx

Review - Factoring.pdf

Worksheet - Factoring Review.doc