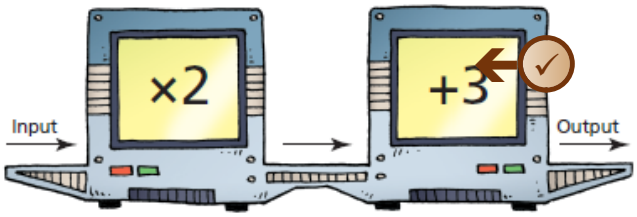
5.2 Properties of Functions

LESSON FOCUS Develop the concept of a function.

Make Connections



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

What is the rule for the Input/Output machine above?

Which numbers would complete this table for the machine?

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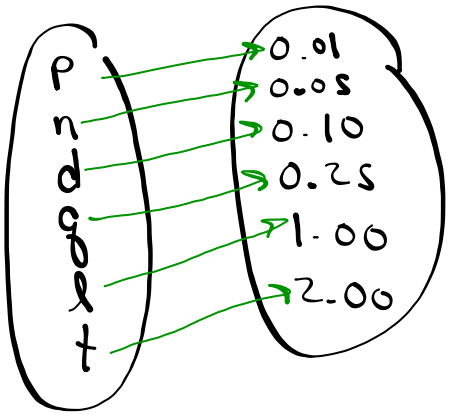
3 i)

x Coin	y Value
penny	0.01
nickle	0.05
dime	0.10
quarter	0.25
loonie	1.00
toonie	2.00

i) Ordered pair Coin first then value 2nd. Comparing the coin to it's value

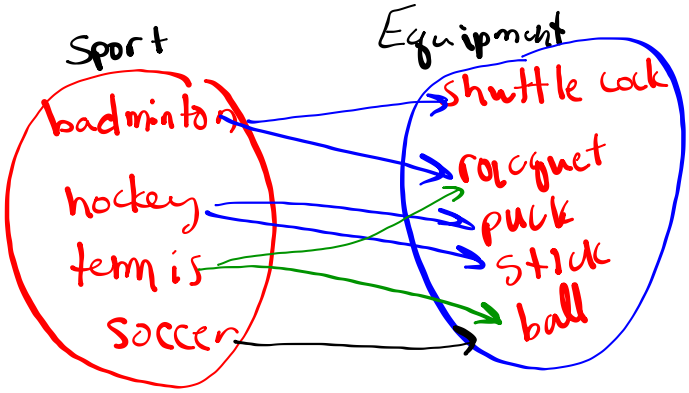
(x, y)

ii) {(penny, 0.01), (nickle, 0.05), (dime, 0.10), (quarter, 0.25), (loonie, 1.00), (toonie, 2.00)}



3b) i) Compare Sports to the equipment that they use. Ordered pair Sports first, then equipment second.

ii) {(bad, shuttlecock), (badminton, racquet), (hockey, puck), (hockey, stick), (tennis, ball), (tennis, raquet), (soccer, ball)}



Independent / Dependent

x y

$y = 3x + 1$

Dependent (y)

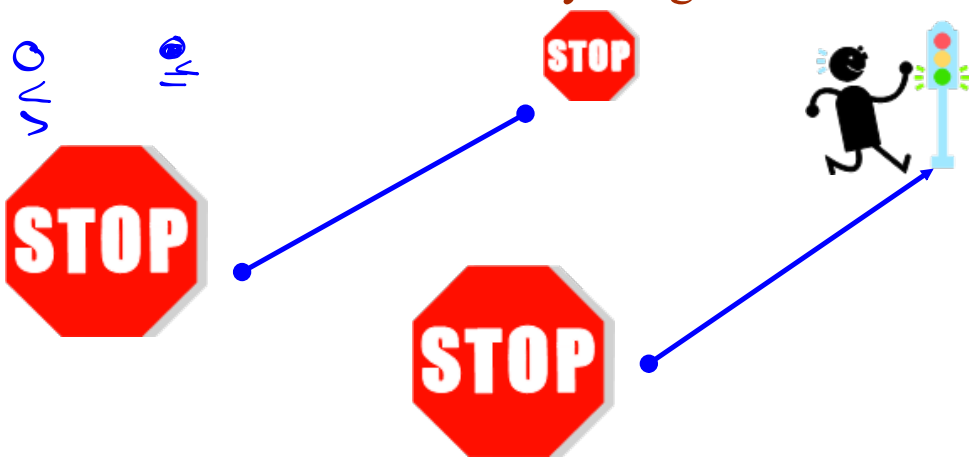
- a variable whose value is determined by the value of another(independent) variable.

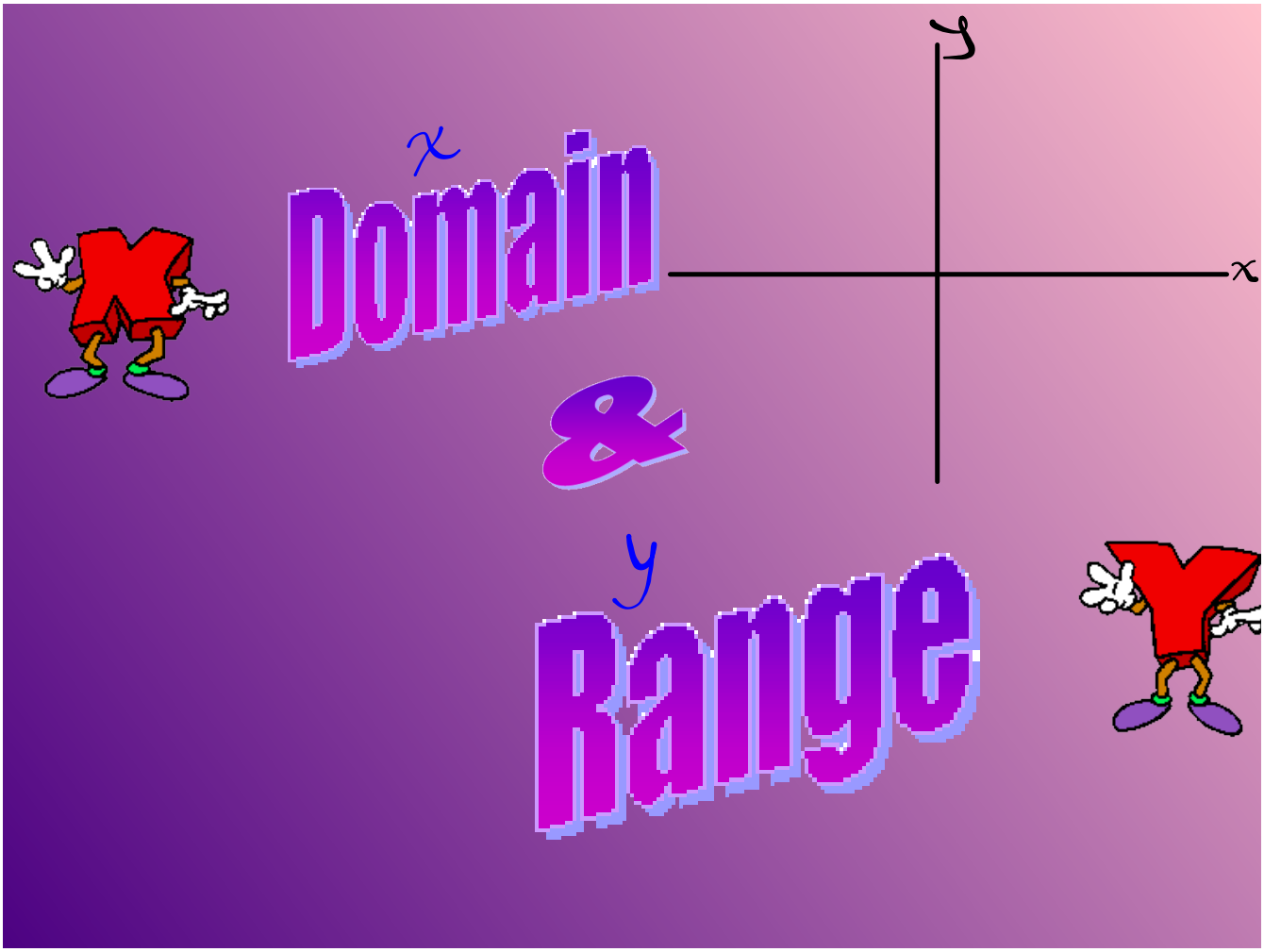
Independent (x)

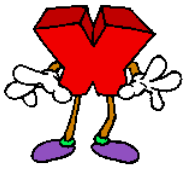
- a variable whose value is not determined by the value of another variable, and whose value determines the value of another (dependent) variable

Limits?

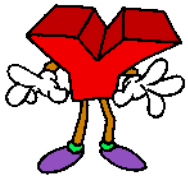
There are limits to everything in life!




x
Domain
&
y
Range
y
x



Domain & Range



Domain - the set of first elements in a relation

Input x | output y

Range - the set of second elements in a relation

$y = 2x + 3$

Input	Output
0	3
1	5
2	7
3	9
4	11
5	13

+2

Domain and Range

Dr. Math says...

" The domain of a function is the set of all the stuff you can plug into the function. "

" The range of a function is the set of all the stuff you can get out of the function. "

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

domain

First

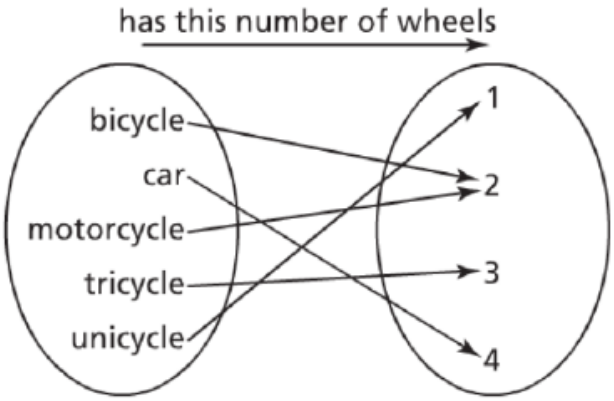
Rang

Second

(Sport, Equipment)

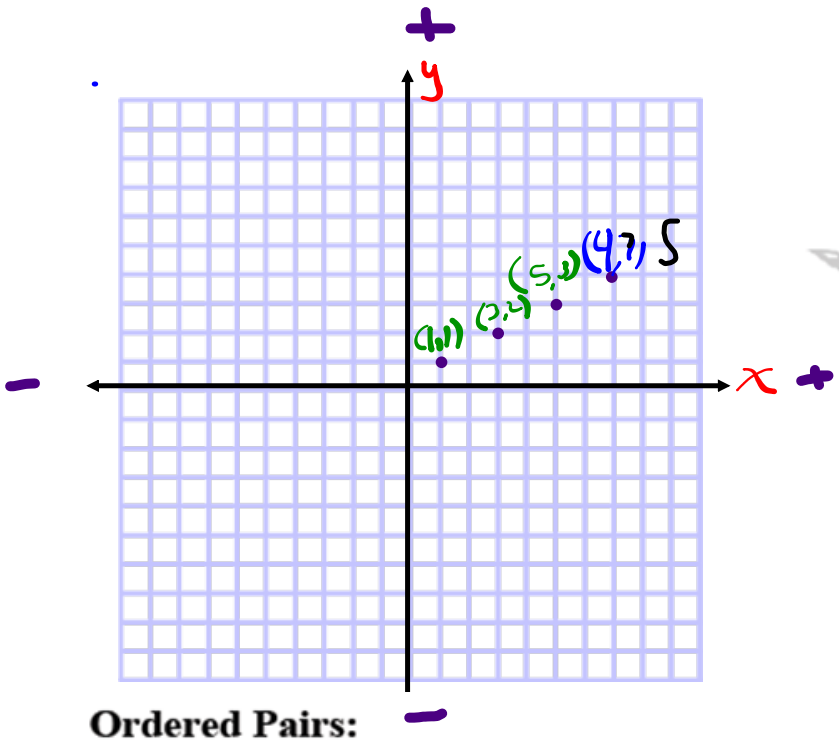
Domain The set of first elements:
{ badminton, hockey, tennis, soccer}

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)

$(\leftrightarrow, \updownarrow)$

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: $\{1, 3, 5, 7, 9\}$

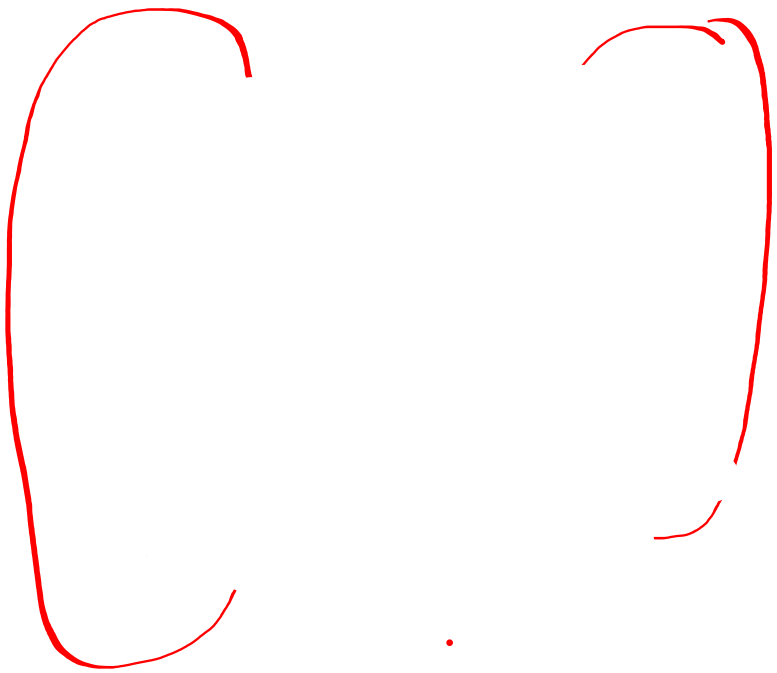
Range The set of second elements: $\{1, 2, 3, 4, 5\}$

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

State Domain & Range

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

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



How do you state the range?

When connected lines

$$\{y \mid y \leq 5, y \in R\}$$

$$\{y \mid -5 \leq y \leq 8, y \in I\}$$

Important Study

Line => "R"
Dots "I"

How to write Range

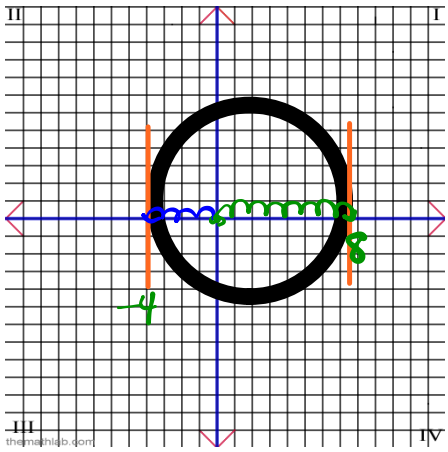
$$\{y \mid \square \leq y \leq \square, y \in \square\}$$

How to write Domain

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

Domain

wide



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

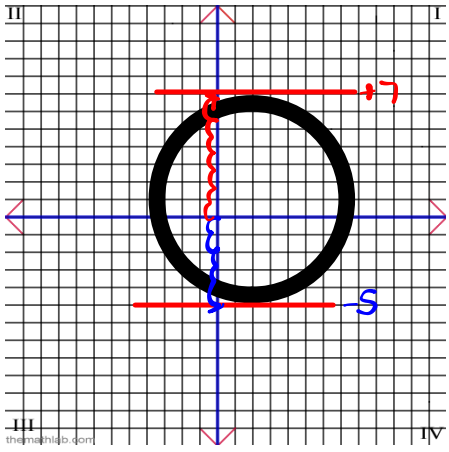
X is the independent Variable

$\{x \mid \underset{\text{left}}{-4} \le x \le \underset{\text{Right}}{8}, x \in \underline{R}\}$

connected R dots ⇒ I

$\{y \mid \underset{\text{lowest}}{-5} \le y \le \underset{\text{highest}}{+7}, y \in \underline{R}\}$

Range

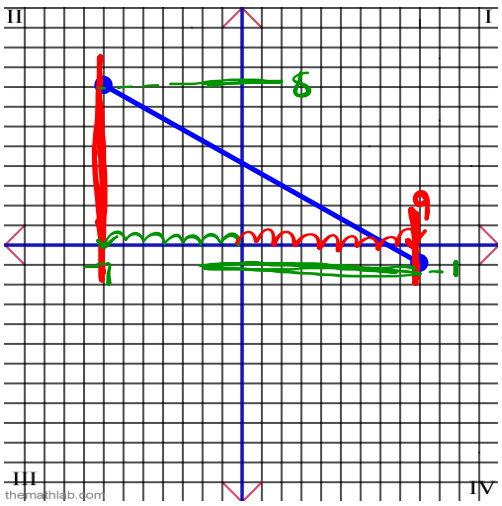


The **range** represents all the values of y.

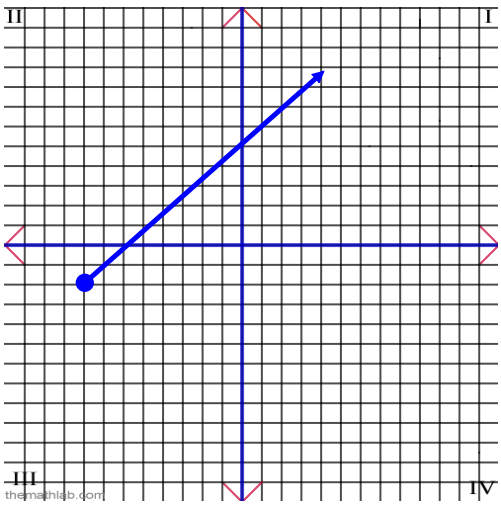
Y is the dependent Variable

EXAMPLES!

1.



2.



$\{x \mid -7 \leq x \leq 9, x \in \mathbb{R}\}$

width

connected line

$\{y \mid -1 \leq y \leq 8, y \in \mathbb{R}\}$

Attachments

Domain & Range 1.doc