

Digits 7-1/7-2

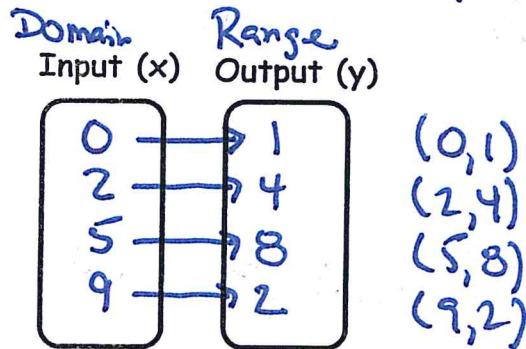
Goal: I will be able to recognize and represent a function

Here's How...Notes & Examples

Tool Bag
Formulas,
equations,
vocabulary, etc.

Relation

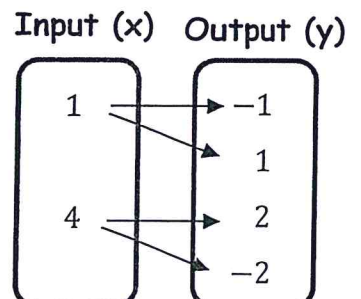
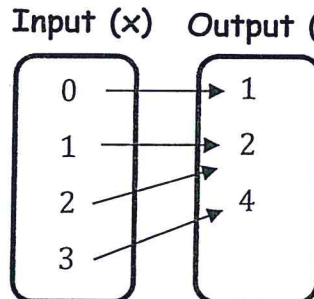
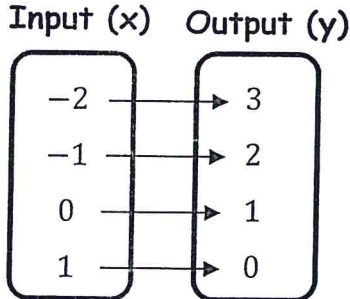
a set of points. $\{(0,1), (2,4), (5,8), (9,2)\}$
Format: (x, y) (Input, Output) (Domain, Range)



Mapping Diagram

You Try

Write the ordered pairs that correspond to the following mapping diagrams

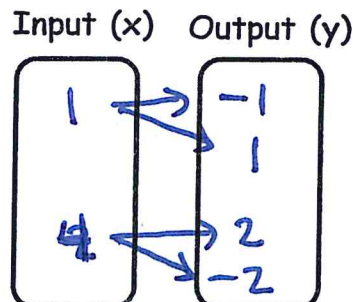
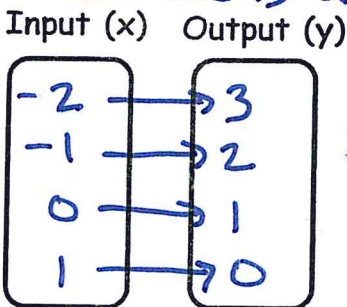


$\{(-2,3), (-1,2), (0,1), (1,0)\}$ $\{(0,1), (1,2), (2,2), (3,4)\}$ $\{(1,1), (1,1), (4,2), (4,-2)\}$

Function

each input can have only one output.

Which one is a function?



Yes, because 1 input has only 1 output

No, because 1 input can have 2 outputs

You Try

Given the following relations, which ones are functions?

1. $\{(0,1), (1,4), (2,5), (3,7)\}$ 2. $\{(-2,0), (-1,0), (0,0), (1,0)\}$ 3. $\{(0,-1), (0,3), (1,2), (3,2)\}$

Input Output
 $0 \rightarrow 1$
 $1 \rightarrow 4$
 $2 \rightarrow 5$
 $3 \rightarrow 7$
 Yes

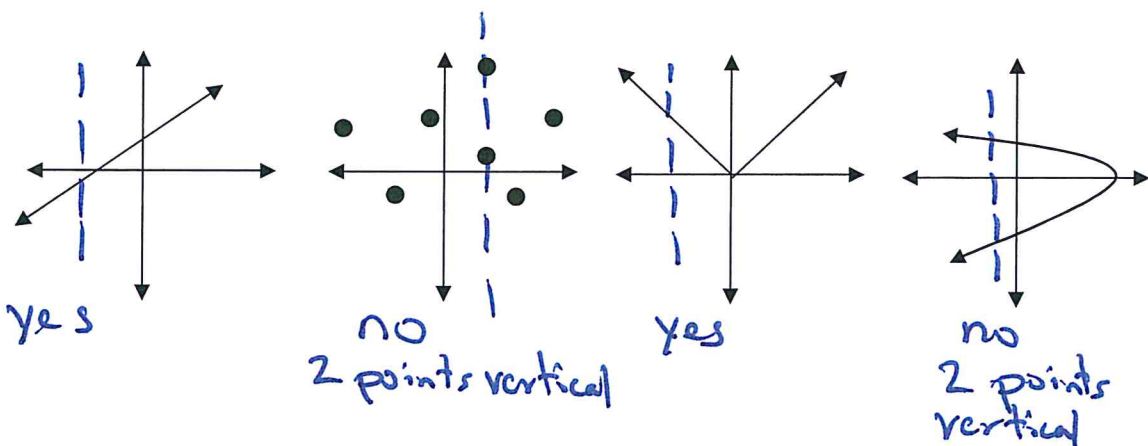
Input Output
 $-2 \rightarrow 0$
 $-1 \rightarrow 0$
 $0 \rightarrow 0$
 $1 \rightarrow 0$
 Yes

Input Output
 $0 \rightarrow -1$
 $0 \rightarrow 3$
 $1 \rightarrow 2$
 $3 \rightarrow 2$
 No, because input 0 has 2 outputs (-1 & 3)

Vertical Line Test

Use a vertical line on a graph to see if it is a function. If the vertical line passes through only 1 point, then it is a function.

Which of the following are functions, and which are not?



Different Ways to represent a Function

Example

A car gets 28 miles per gallon. The distance is a function of the number of gallons of gas.

Ordered Pairs

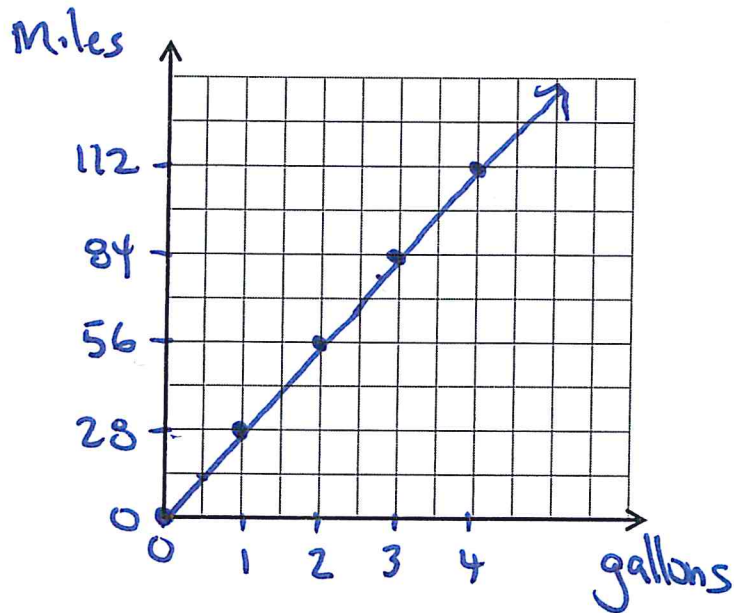
(Input, output)
 (gallons, distance)

$\{(0,0), (1,28), (2,56), (3,84)\}$

Table of Values

Input, x (Number of gallons)	Output, y (Distance in miles)
0	0
1	28
2	56
3	84

Graph



Rule

Formula/Equation)

Is an equation to represent the function
 $y = mx + b$
 $y = 28x$

We Try

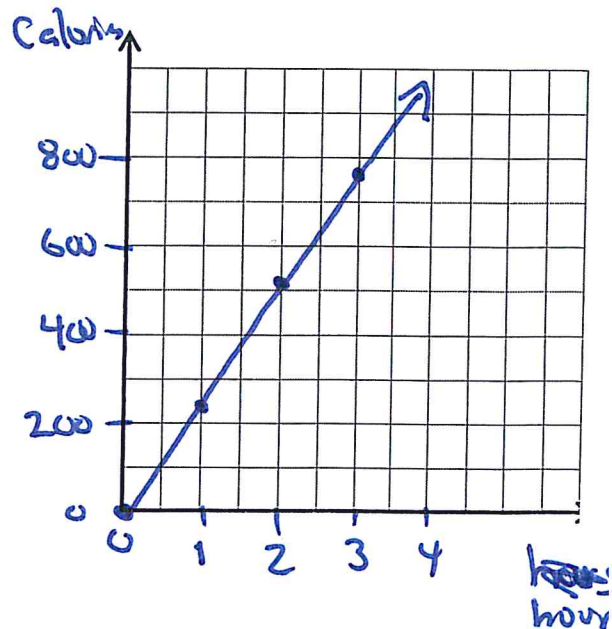
Wii

In one hour of walking, you burn 257 calories. The total number of calories is a function of the number of hours you walked. Represent this function in 4 different ways.

$\{(hours, calories)\}$ $\{(0,0), (1,257), (2,514), (3,771)\}$

Domain Input, x	Range Output, y
hours	Calories
0	0
1	257
2	514
3	771

$$y = 257x$$



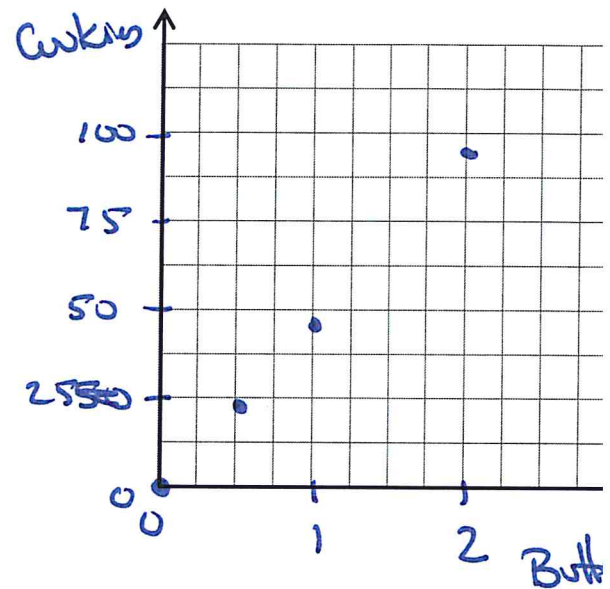
You Try

You can make 2 dozen cookies with $\frac{1}{2}$ stick of butter. The number of cookies is a function of butter. Represent this function in 4 ways with butter as the input and cookies as the output.

Ordered Pairs

$(0, 0)$ $(\frac{1}{2}, 24)$ $(1, 48)$ $(2, 96)$

Butter	Cookies
0	0
$\frac{1}{2}$	24
1	48
2	96



Rule: ~~$y = \frac{1}{2}x$~~
 $y = 48x$