Bellringer

x	1	2	3	4	5
y	5	8	12	14	17

1. Does this table represent a linear relationship? Why or why not?

6.1 Identifying and Representing Functions

8.F.1
Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output

Objectives

Determining Functions (does each input have exactly one output)

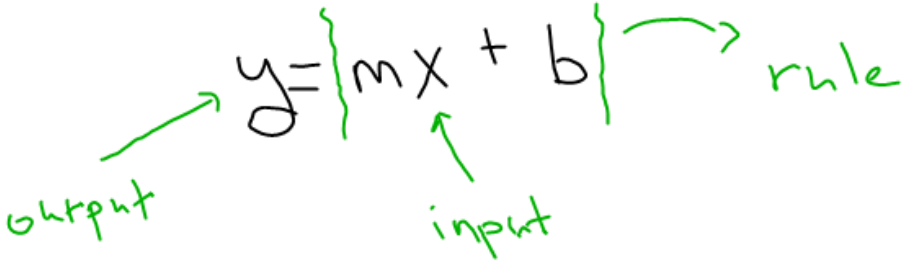
1. Using Mapping Diagrams
2. Using tables

Vocabulary

Function - assigns each input to exactly one output

Input - value you put into the function
- ↳ x-values, independent variable, domain, "inside the equation"

Output - result once the function is applied
- ↳ y-values, dependent variable, range, "outside the equation"



EXPLORE ACTIVITY Real World

COMMON CORE 8.F.1

Understanding Relationships

Carlos needs to buy some new pencils from the school supply store at his school. Carlos asks his classmates if they know how much pencils cost. Angela says she bought 2 pencils for $0.50. Paige bought 3 pencils for $0.75, and Spencer bought 4 pencils for $1.00.

Carlos thinks about the rule for the price of a pencil as a machine. When he puts the number of pencils he wants to buy into the machine, the machine applies a rule and tells him the total cost of that number of pencils.

X y

	Number of Pencils	Rule	Total Cost
i.	2	.25(2) ?	.50
ii.	3	.25(3) ?	.75
iii.	4	.25(4) ?	1.00
iv.	x	.25x	
v.	12	.25(12)	3.00

+1 +1 +.25 +.25

$y = .25x$

$y = \frac{1}{4}x$

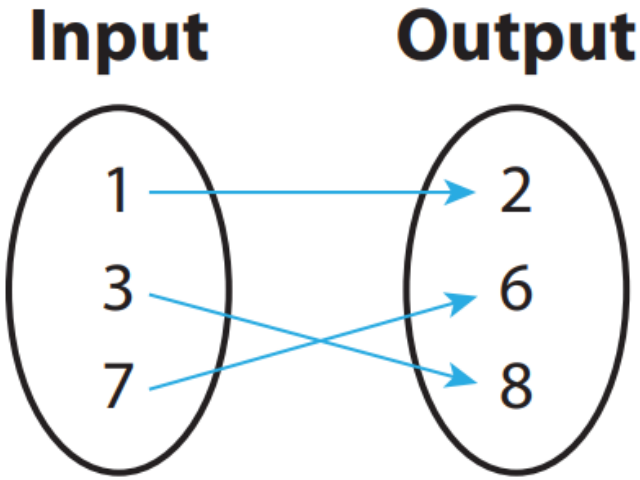
$m = \frac{\Delta y}{\Delta x} = \frac{.25}{1} = .25$

Identifying Functions from Mapping Diagrams

EXAMPLE 1

Determine whether each relationship is a function.

A

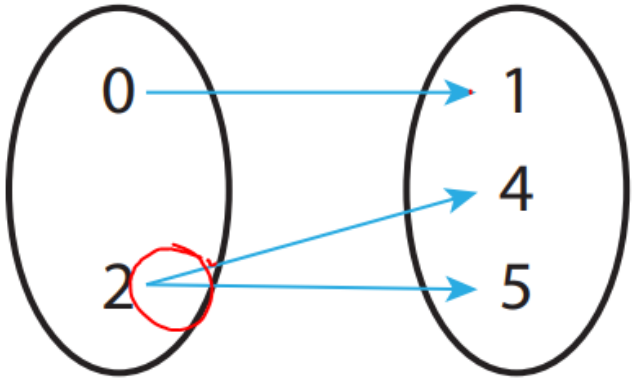


Function because each input has exactly one output

EXAMPLE 1

Determine whether each relationship is a function.

B

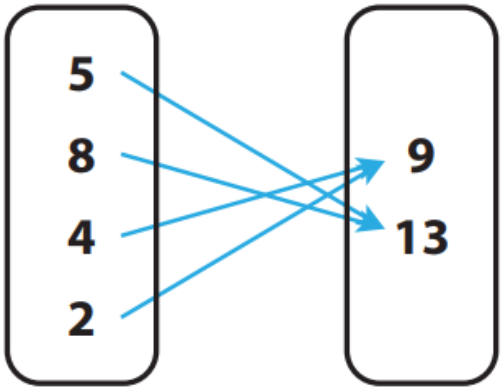


Not a function because the input of 2 has multiple outputs

ADDITIONAL EXAMPLE 1

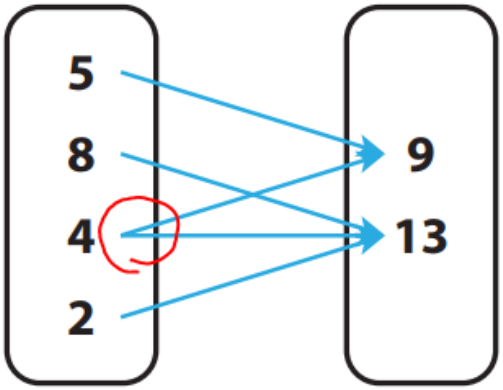
Determine whether each relationship is a function.

A



Function

B

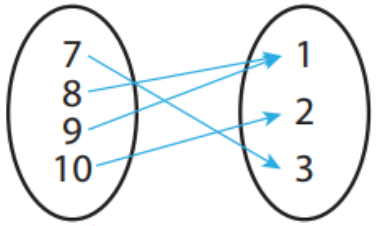


Not a Function

YOUR TURN

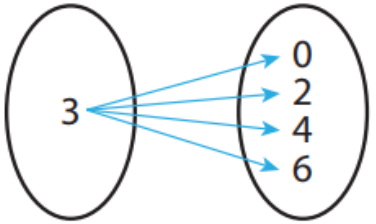
Determine whether each relationship is a function. Explain.

4.



Function; Each input has exactly one output

5.



Not a Function; because input has multiple outputs

Identifying Functions from Tables

EXAMPLE 2

Determine whether each relationship is a function.

A

Input	Output
5 ✓	7
10 ✓	6
15 ✓	15
20 ✓	2
25 ✓	15

Function

B

Input	Output
1 ✓ —	10
5	8
4	6
1 ✓ —	4
7	2

N.F.

ADDITIONAL EXAMPLE 2

Determine whether each relationship is a function.

A

Input	Output
2	10
4	12
6	24
4	8

Not A Function

B

Function

Input	Output
2	10
4	10
6	6
8	8

YOUR TURN

Determine whether each relationship is a function. Explain

7.

Input	Output
53	53
24	24
32	32
17	17
45	45

Function

8.

Input	Output
14	52
8	21
27	16
36	25
8	34

Not a function

Create your own Mapping Diagram

(1) One Should be function

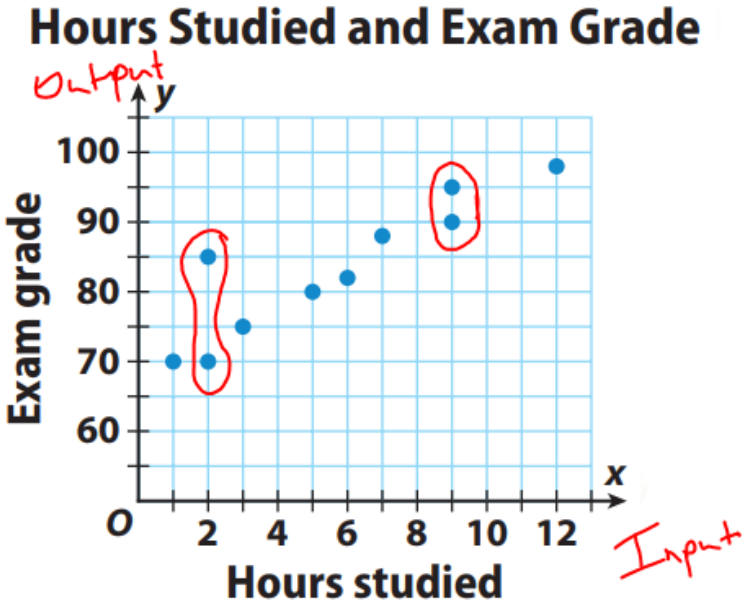
(2) One Should not be function

Trade with Someone at your table to solve

Identifying Functions from Graphs

EXAMPLE 3

The graph shows the relationship between the number of hours students spent studying for an exam and the exam grades. Is the relationship represented by the graph a function?



- Look for stacked points
- Use the Vertical Line Test

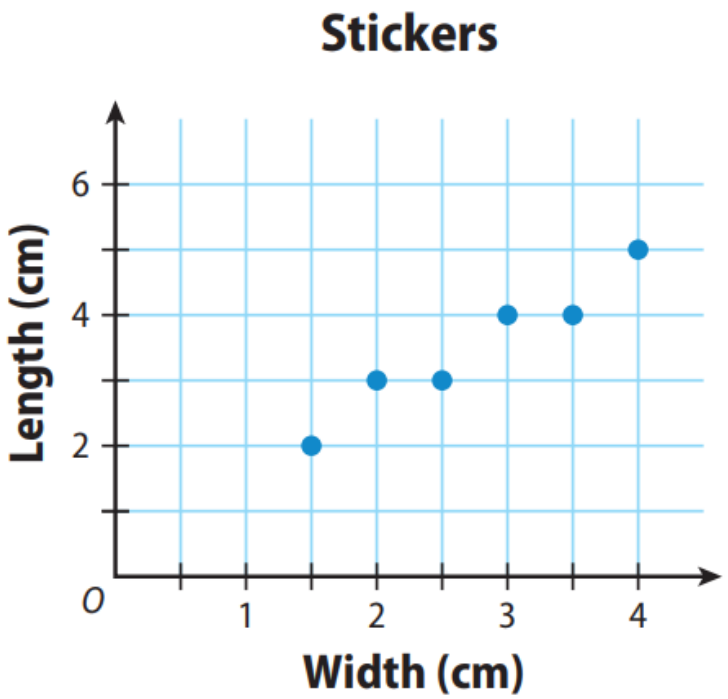
Not a function ⟶

2 → 70
2 → 85

9 → 90
9 → 95

ADDITIONAL EXAMPLE 3

The graph shows the relationship between the width of a sticker and the length of the sticker sold at an art store. Is the relationship represented by the graph a function? Explain why.

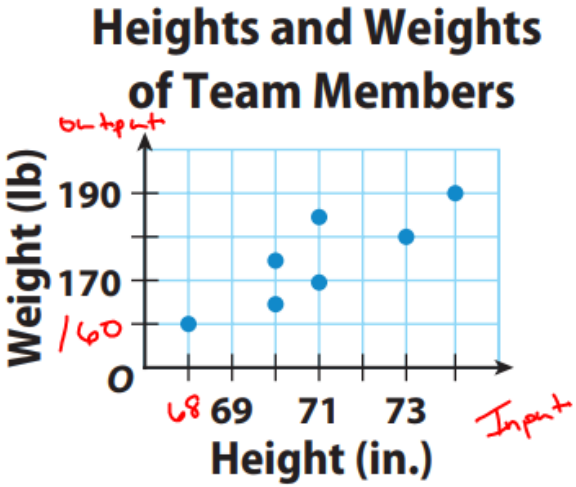


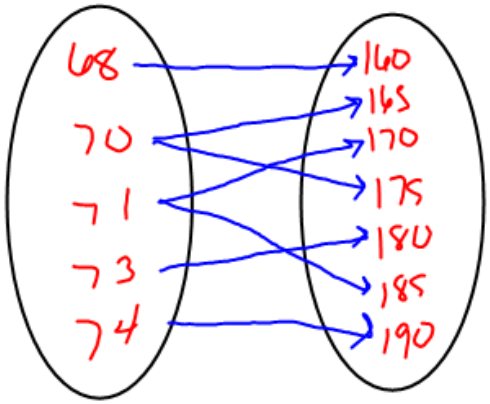
Function ; each input has exactly one output

YOUR TURN

10. The graph shows the relationship between the heights and weights of the members of a basketball team. Is the relationship represented by the graph a function? Explain.

Not a Function; Some inputs have multiple outputs





Identifying Functions from Ordered pairs

(1,70)
(2,70) ★
(3,75)
(5,80)
(2,85) ★

(6,82)
(7,88)
(9,90) ★
(12,98)
(9,95) ★

Does this represent a function?

Not a function

Not a function

Guided Practice

Complete each table. In the row with *x* as the input, write a rule as an algebraic expression for the output. Then complete the last row of the table using the rule. (Explore Activity)

1.

Input	Output
Tickets	Cost ($)
2	40
5	100
7	140
x	
10	

write rule

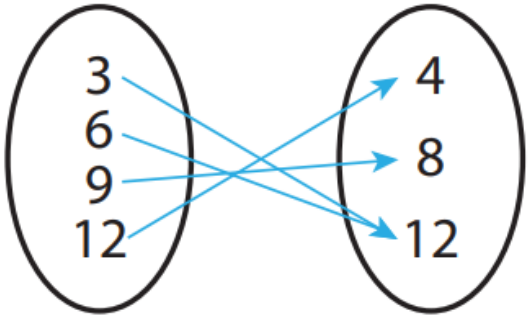
3.

Input	Output
Muffins	Cost ($)
1	2.25
3	6.75
6	13.50
x	
12	

write rule

Determine whether each relationship is a function. (Examples 1 and 2)

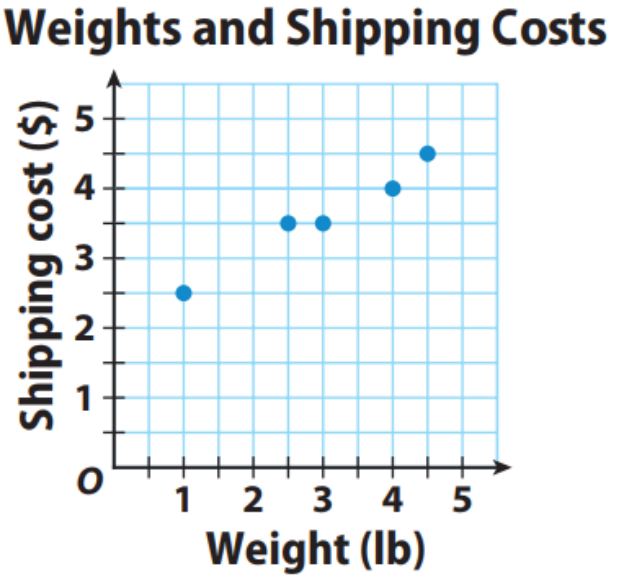
4.



5.

Input	Output
3	20
4	25
5	30
4	35
6	40

6. The graph shows the relationship between the weights of 5 packages and the shipping charge for each package. Is the relationship represented by the graph a function? Explain.



1-41

p158-160

1-14

E.C. 15-16