One Input, What Output?

Sort relationships by what each input determines.

PA.A.1.1 "Recognize that a function is a relationship between an independent variable and a dependent variable in which the value of the independent variable determines the value of the dependent variable."

NAME _____ DATE _____

FUNCTION	NOT A FUNCTION
Each input has exactly one output. Different inputs can share the same output. Input: the length of a square's side. Output: its perimeter.	At least one input has two or more different outputs. Input: a T-shirt size. Output: a person who wears that size. One size can match many people.

1 SORT

8 items

Circle FUNCTION or NOT for each numbered relationship, then choose two items and explain your choice for each using inputs and outputs.

1.	Input: number of movie tickets bought. Output: total cost at $8 per ticket.	FUNCTION	NOT
2.	Pairs: (1, 4), (2, 4), (3, 9).	FUNCTION	NOT
3.	Pairs: (5, 2), (5, 7), (8, 1).	FUNCTION	NOT
4.	Input: minutes after a timer starts. Output: seconds elapsed.	FUNCTION	NOT
5.	Input: a positive whole number. Output: each of its positive factors.	FUNCTION	NOT
6.	Pairs: (0, -3), (4, 6), (0, 2).	FUNCTION	NOT
7.	Input: an integer. Output: its distance from 0.	FUNCTION	NOT
8.	Input: Route 4. Output: each of its stops, Oak Park and City Hall.	FUNCTION	NOT

2 PROVE IT

Explain your thinking

Pick two items from Part 1. For each one, tell how you knew where it belonged.

ITEM # _____ **HOW I KNEW** _____

ITEM # _____ **HOW I KNEW** _____

3 MAKE YOUR OWN

One of each

Write one new FUNCTION relationship and one new NOT relationship, and name the input and output in each.

FUNCTION _____

NOT _____

CHALLENGE

Can two different inputs have the same output in a FUNCTION? Write three ordered pairs that support your answer and explain why they form a function.

ANSWER KEY

One Input, What Output?

GRADE 8 · PA.A.1.1

PART 1 · SORT

#	ITEM	CATEGORY	WHY
1	Input: number of movie tickets bought. Output: total cost at $8 per ticket.	**FUNCTION**	A given number of tickets determines one total cost.
2	Pairs: (1, 4), (2, 4), (3, 9).	**FUNCTION**	Each input has one output; two inputs may share 4.
3	Pairs: (5, 2), (5, 7), (8, 1).	**NOT**	Input 5 has two different outputs.
4	Input: minutes after a timer starts. Output: seconds elapsed.	**FUNCTION**	Each amount of time in minutes determines one amount in seconds.
5	Input: a positive whole number. Output: each of its positive factors.	**NOT**	Some inputs have several outputs; for example, 6 has factors 1 and 2.
6	Pairs: (0, -3), (4, 6), (0, 2).	**NOT**	Input 0 has two different outputs.
7	Input: an integer. Output: its distance from 0.	**FUNCTION**	Each integer has exactly one distance from 0.
8	Input: Route 4. Output: each of its stops, Oak Park and City Hall.	**NOT**	The one input, Route 4, has two different outputs.

PART 2 · PROVE IT

Accept any explanation that names the deciding feature from the rule box for the chosen item.

PART 3 · MAKE YOUR OWN (SAMPLE ANSWERS)

- **FUNCTION**: Input: the number of pencils bought. Output: the total cost at $2 per pencil.
- **NOT**: Input: a vowel. Output: any word that begins with it, such as A leading to apple or ant.

Challenge: Yes. (1, 5), (2, 5), and (3, 8) form a function because each input has exactly one output, even though 1 and 2 share 5.

Items 1, 2, 4, and 7 are FUNCTION; items 3, 5, 6, and 8 are NOT. For PROVE IT, accept any two explanations that correctly use inputs and outputs to justify the choices.