One Input, What?

Sort relations by what happens to each input.

A1.F.1.1 "Distinguish between relations and functions."

NAME _____ DATE _____

FUNCTION	NOT A FUNCTION
A function pairs each input with exactly one output. Different inputs may share an output.	A relation is not a function if an input is paired with two different outputs.
Each locker number is matched to exactly one combination.	One concert ticket is matched to both seat A12 and seat B14.

1 SORT

8 items

Circle YES or NO for each item, then choose two items from different categories and explain how you decided.

1. {(1, 4), (2, 4), (3, 6)} YES NO

2. {(-3, 8), (-3, 2), (0, 5)} YES NO

3. One paint color is paired with two prices, $5 and $8. YES NO

4. Input: minutes since a timer started. Output: seconds since it started. YES NO

5. Input: a real number x. Output: $x^2 + 1$. YES NO

6. {(7, 0), (9, 2), (7, 3)} YES NO

7. Input: a day of the week. Output: the next day. YES NO

8. Input: a positive integer. Outputs: each of its positive factors. YES NO

2 PROVE IT

Explain your thinking

Choose two items from different categories and explain how you decided.

ITEM # _____ **HOW I KNEW** _____

ITEM # _____ **HOW I KNEW** _____

3 MAKE YOUR OWN

One of each

Write one new relation that is a function and one new relation that is not a function; use ordered pairs.

YES _____

NO _____

CHALLENGE

Change exactly one ordered pair in item 2 to make it a function, then explain why your change works.

ANSWER KEY # One Input, What?

PART 1 · SORT

#	ITEM	CATEGORY	WHY
1	{(1, 4), (2, 4), (3, 6)}	**YES**	Each input has exactly one output; sharing the output 4 is allowed.
2	{(-3, 8), (-3, 2), (0, 5)}	**NO**	The input -3 has two different outputs, 8 and 2.
3	One paint color is paired with two prices, $5 and $8.	**NO**	The same input, one paint color, has two different outputs.
4	Input: minutes since a timer started. Output: seconds since it started.	**YES**	Each elapsed time in minutes determines exactly one elapsed time in seconds.
5	Input: a real number x. Output: $x^2 + 1$.	**YES**	The rule gives exactly one output for every real-number input.
6	{(7, 0), (9, 2), (7, 3)}	**NO**	The input 7 has two different outputs, 0 and 3.
7	Input: a day of the week. Output: the next day.	**YES**	Each day has exactly one next day.
8	Input: a positive integer. Outputs: each of its positive factors.	**NO**	Some positive integers have more than one positive factor, so one input can have multiple outputs.

PART 2 · PROVE IT

Task: Choose two items from different categories and explain how you decided.
Accept any explanation that names the deciding feature from the rule box for the chosen item.

PART 3 · MAKE YOUR OWN (SAMPLE ANSWERS)

- **YES**: {(10, 11), (12, 11)}
- **NO**: {(14, 15), (14, 16)}

Challenge: {(-3, 8), (4, 2), (0, 5)}. Each input now has exactly one output.

For Part 2, accept explanations that identify one output per input in a YES item and two different outputs for one input in a NO item. For example, item 1 has one output per input, while item 2 pairs -3 with both 8 and 2.