LESSON MAKER PRO

Input Output Detectives

Decide whether each relationship is a function.

GRADE 8 · 8.FGR.5.1

8.FGR.5.1 "Show and explain that a function is a rule that assigns to each input exactly one output."

NAME _____ DATE _____

ONE OUTPUT RULE

A function matches every input with exactly one output. Different inputs can share an output, but one input cannot point to two different outputs. Check each input to see whether it has only one output.

WORKED EXAMPLE

For the rule y = 4x - 7, find the output when x = 13. Then decide whether the rule is a function.

1. Substitute 13 for x: y = 4(13) - 7.
2. Multiply: y = 52 - 7.
3. Subtract: y = 45.
4. The rule gives one output for each input.

Answer: y = 45; yes, the rule is a function.

PRACTICE 6 problems

1 Does this table represent a function? Input: -3, 0, 5 Output: 8, 8, 9

ANSWER _____

2 Does the relation {(6, 2), (8, 3), (6, 9)} represent a function?

ANSWER _____

3 A mapping sends -1 to 0, 1 to 0, and 3 to 5. Is the mapping a function?

ANSWER _____

4 The rule is y = 5x - 1. What is the output when x = 3?

ANSWER _____

5 Does this table represent a function? Input: 9, 9, -2 Output: 1, 1, 6

ANSWER _____

6 A relation pairs input 5 with output 0 and also with output 6. Is the relation a function?

ANSWER _____

APPLY IT Show your work

1 A student podcast lists its episode number and length in minutes: episode 1 is 12 minutes, episode 2 is 15 minutes, and episode 3 is 12 minutes. Is episode number to episode length a function?

WORK SPACE

ANSWER _____

2 In a game, a reward chart says that completing 0 quests earns 0 coins, completing 2 quests earns 10 coins, completing 5 quests earns 20 coins, and completing 5 quests earns 30 coins during a special event. Does number of completed quests to coins earned represent a function?

WORK SPACE

ANSWER _____

CHALLENGE One step up

Maya says this table cannot be a function because all of the inputs map to output 6. Input: -5, 0, 2 Output: 6, 6, 6 Is Maya correct? Explain in one sentence.

WORK SPACE AND ANSWER

ANSWER KEY

Input Output Detectives

GRADE 8 · 8.FGR.5.1

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Does this table represent a function? Input: -3, 0, 5 Output: 8, 8, 9	**Yes. Each input has exactly one output.**
2	Does the relation {(6, 2), (8, 3), (6, 9)} represent a function?	**No. Input 6 has two different outputs, 2 and 9.**
3	A mapping sends -1 to 0, 1 to 0, and 3 to 5. Is the mapping a function?	**Yes. Each input has exactly one output.**
4	The rule is y = 5x - 1. What is the output when x = 3?	**14**
5	Does this table represent a function? Input: 9, 9, -2 Output: 1, 1, 6	**Yes. Input 9 repeats, but it is paired with the same output, 1, each time.**
6	A relation pairs input 5 with output 0 and also with output 6. Is the relation a function?	**No. Input 5 has two different outputs.**

PART 2 · APPLY IT

1. **Yes.** Each episode number has exactly one length. Check each episode number. The repeated length of 12 is allowed because different inputs may have the same output.
2. **No.** The input 5 is paired with two different outputs, 20 coins and 30 coins. The relation uses number of completed quests as the only input. Because input 5 has two outputs, it is not a function as stated.

CHALLENGE

Maya is not correct because different inputs may share output 6, and each input has only one output.

Accept equivalent explanations that state each input has one output or identify an input with two different outputs. For the challenge, accept any one-sentence explanation that notes repeated outputs are allowed.