LESSON MAKER PRO

Function Detectives

Test relations, then name their inputs and outputs.

GRADE 8 · 8.PFA.2

8.PFA.2 "The student will determine whether a given relation is a function and determine the domain and range of a function. Determine whether a relation, represented by a set of ordered pairs, a table, or a graph of discrete points is a function..."

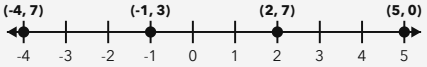
NAME _____ DATE _____

SPOT THE FUNCTION RULE

A relation is a function when each input, or x-value, is paired with exactly one output, or y-value. The domain is the set of x-values, and the range is the set of y-values. Outputs may repeat, but one input cannot have two different outputs.

WORKED EXAMPLE

Use the labeled ordered pairs on the number line. Is the relation a function? State its domain and range.



1. List the x-values: -4, -1, 2, and 5.
2. Each x-value is paired with only one y-value, so the relation is a function.
3. The domain is {-4, -1, 2, 5}. The range is {0, 3, 7}.

Answer: Function; domain {-4, -1, 2, 5}; range {0, 3, 7}.

PRACTICE 6 problems

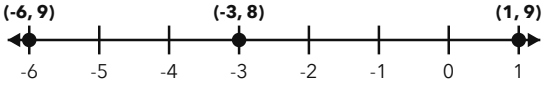
1 Is {(4, 6), (8, 9), (4, 10)} a function? Explain briefly.

ANSWER _____

2 The relation {(6, -5), (9, -2), (10, 8), (12, -5)} is a function. State its domain and range.

ANSWER _____

3 The labels on the number line show ordered pairs in a relation. Is the relation a function? State its domain and range.



ANSWER _____

4 The table shows a relation. x: -9, -8, -6 y: 4, 6, 10 Is the relation a function? State its domain and range.

ANSWER _____

5 Is {(11, 4), (12, 4), (13, 6), (14, 4)} a function? State its domain and range.

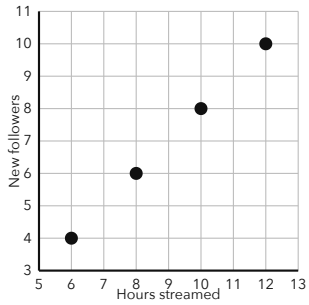
ANSWER _____

6 The table shows a relation. x: 15, 16, 15 y: -8, 9, 10 Is the relation a function? Explain briefly.

ANSWER _____

APPLY IT Show your work

1 The graph shows how many new followers Jada gained after streaming different numbers of hours during four weeks. The x-axis is hours streamed, and the y-axis is new followers. Is this relation a function? State the domain and range.



ANSWER _____

2 A player records the game level played and the coins earned in each round. Use the table. Is level played to coins earned a function? Explain.

GAME ROUNDS

Level played	Coins earned
6	40
7	60
6	80
8	100

ANSWER _____

CHALLENGE One step up

Nia says {(18, 6), (19, 6), (20, 9), (21, 6), (22, 9)} is not a function because the output 6 repeats. Is Nia correct? Explain your reasoning.

WORK SPACE AND ANSWER

ANSWER KEY

Function Detectives

GRADE 8 · 8.PFA.2

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Is {(4, 6), (8, 9), (4, 10)} a function? Explain briefly.	**Not a function. The input 4 has two outputs, 6 and 10.**
2	The relation {(6, -5), (9, -2), (10, 8), (12, -5)} is a function. State its domain and range.	**Domain {6, 9, 10, 12}; range {-5, -2, 8}.**
3	The labels on the number line show ordered pairs in a relation. Is the relation a function? State its domain and range.	**Function; domain {-6, -3, 1}; range {8, 9}.**
4	The table shows a relation. x: -9, -8, -6 y: 4, 6, 10 Is the relation a function? State its domain and range.	**Function; domain {-9, -8, -6}; range {4, 6, 10}.**
5	Is {(11, 4), (12, 4), (13, 6), (14, 4)} a function? State its domain and range.	**Function; domain {11, 12, 13, 14}; range {4, 6}.**
6	The table shows a relation. x: 15, 16, 15 y: -8, 9, 10 Is the relation a function? Explain briefly.	**Not a function. The input 15 has two outputs, -8 and 10.**

PART 2 · APPLY IT

1. **Function; domain {6, 8, 10, 12}; range {4, 6, 8, 10}.** Each number of hours has exactly one plotted follower total. Read the x-coordinates for the domain and the y-coordinates for the range.
2. **Not a function. Level 6 is paired with both 40 coins and 80 coins.** Compare repeated level numbers. Because level 6 has two different coin totals, one input has more than one output.

CHALLENGE

No. The relation is a function because each input, 18, 19, 20, 21, and 22, has exactly one output. Outputs such as 6 may repeat.

Accept domain and range written in any order within each set. Accept equivalent explanations that identify an input paired with two different outputs, or explain that repeated outputs are allowed.