

Input Output Detectives

Decide whether each relation follows the function rule.

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 _____

THE BIG IDEA

For a function, each input can match with only one output. The domain is the set of inputs, and the range is the set of outputs, with repeats written only once.

WORKED EXAMPLE

Determine whether $\{(-10, 12), (-6, 16), (11, 12), (14, 20)\}$ is a function. Then find its domain and range.

1. List the inputs: -10, -6, 11, 14.
2. Check for an input paired with two different outputs. None repeats.
3. The relation is a function.
4. List each input and output once.

Answer: Function; domain = $\{-10, -6, 11, 14\}$; range = $\{12, 16, 20\}$

PRACTICE 6 problems

- 1** Determine whether $\{(1, 8), (4, 6), (6, 8), (9, 2)\}$ is a function. Then find its domain and range.

ANSWER _____

- 2** Determine whether the table represents a function. Then find its domain and range. x | -3 | 0 | 3 | 8 y | 1 | 9 | 9 | 4

ANSWER _____

- 3** A graph has discrete points at $(-5, 4)$, $(-5, 7)$, $(2, 1)$, and $(6, 3)$. Is the relation a function? Find its domain and range.

ANSWER _____

- 4** Determine whether the table represents a function. Then find its domain and range. x | 7 | 10 | 13 | 17 y | -2 | 5 | -2 | 9

ANSWER _____

- 5** Determine whether $\{(2, 5), (4, 7), (2, 9), (6, 7)\}$ is a function. Then find its domain and range.

ANSWER _____

- 6** A graph has discrete points at $(-8, 2)$, $(-4, 5)$, $(0, 5)$, $(3, 1)$, and $(3, 4)$. Is the relation a function? Find its domain and range.

ANSWER _____

APPLY IT Show your work

- 1** A student DJ tracks song codes and the number of votes each song receives for a school playlist. Song code | 31 | 32 | 33 | 34 | 35 Votes | 7 | 9 | 7 | 15 | 10 Does this table represent a function? Find the domain and range.

WORK SPACE

ANSWER _____

- 2** At a gaming tournament, a chart matches each player ID to a score that was recorded. Player ID | 41 | 44 | 41 | 49 Score | 6 | 13 | 8 | 13 Does this table represent a function? Find the domain and range.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

A relation has domain $\{-7, -3, 1, 4\}$ and range $\{2, 5, 8\}$. It is a function and contains $(-7, 5)$, $(-3, 2)$, and $(4, 5)$. What is the missing ordered pair with input 1? Explain your reasoning.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Determine whether $\{(1, 8), (4, 6), (6, 8), (9, 2)\}$ is a function. Then find its domain and range.	Function; domain = $\{1, 4, 6, 9\}$; range = $\{8, 6, 2\}$
2	Determine whether the table represents a function. Then find its domain and range. $x \mid -3 \mid 0 \mid 3 \mid 8$ $y \mid 1 \mid 9 \mid 9 \mid 4$	Function; domain = $\{-3, 0, 3, 8\}$; range = $\{1, 9, 4\}$
3	A graph has discrete points at $(-5, 4)$, $(-5, 7)$, $(2, 1)$, and $(6, 3)$. Is the relation a function? Find its domain and range.	Not a function; domain = $\{-5, 2, 6\}$; range = $\{4, 7, 1, 3\}$
4	Determine whether the table represents a function. Then find its domain and range. $x \mid 7 \mid 10 \mid 13 \mid 17$ $y \mid -2 \mid 5 \mid -2 \mid 9$	Function; domain = $\{7, 10, 13, 17\}$; range = $\{-2, 5, 9\}$
5	Determine whether $\{(2, 5), (4, 7), (2, 9), (6, 7)\}$ is a function. Then find its domain and range.	Not a function; domain = $\{2, 4, 6\}$; range = $\{5, 7, 9\}$
6	A graph has discrete points at $(-8, 2)$, $(-4, 5)$, $(0, 5)$, $(3, 1)$, and $(3, 4)$. Is the relation a function? Find its domain and range.	Not a function; domain = $\{-8, -4, 0, 3\}$; range = $\{2, 5, 1, 4\}$

PART 2 • APPLY IT

- Function; domain = $\{31, 32, 33, 34, 35\}$; range = $\{7, 9, 15, 10\}$** Each song code appears once and has one number of votes. The repeated output of 7 does not stop the relation from being a function.
- Not a function; domain = $\{41, 44, 49\}$; range = $\{6, 13, 8\}$** Player ID 41 is paired with both 6 and 8. One input with two different outputs means the relation is not a function.

CHALLENGE

(1, 8). The outputs 2 and 5 already appear, so the missing output must be 8 for the range to be $\{2, 5, 8\}$.

Accept domain and range values in any order as long as each value is listed once. For relations that are not functions, accept the listed domain and range because any relation can have a domain and range.