

Function Detectives

Track inputs, outputs, domains, and ranges.

GRADE 8 • MA.8.F.1.1

MA.8.F.1.1 "Given a set of ordered pairs, a table, a graph or mapping diagram, determine whether the relationship is a function. Identify the domain and range of the relation."

NAME _____

DATE _____

SPOT THE RULE

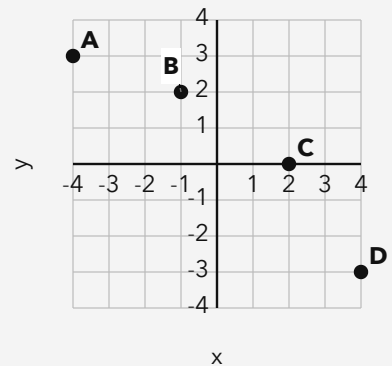
A relation is a function when each input has exactly one output. The domain is the set of inputs, and the range is the set of outputs. On a graph, a relation is not a function if two points are directly above or below each other.

WORKED EXAMPLE

Use the graph to decide whether the relation is a function. Then identify its domain and range.

1. Read the x-values: -4, -1, 2, and 4.
2. Each x-value is used only once, so each input has one output.
3. List the x-values for the domain and the y-values for the range.

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



PRACTICE 6 problems

- 1** Is the relation $\{(1, 5), (5, 6), (6, 7)\}$ a function? Identify the domain and range.

ANSWER _____

- 2** Is the relation $\{(7, 1), (8, 5), (7, 9)\}$ a function? Identify the domain and range.

ANSWER _____

3 Is the relation $\{(9, 8), (10, 8), (11, 12)\}$ a function? Identify the domain and range.

ANSWER _____

4 Is the relation $\{(12, 6), (13, 7), (14, 6), (12, 9)\}$ a function? Identify the domain and range.

ANSWER _____

5 Is the relation $\{(15, 18), (16, 19), (17, 18)\}$ a function? Identify the domain and range.

ANSWER _____

6 Is the relation $\{(20, 21), (21, 22), (22, 23), (23, 21)\}$ a function? Identify the domain and range.

ANSWER _____

APPLY IT Show your work

1 A student tracks the minutes spent practicing guitar after school. Use the table to decide whether the relationship from day to practice minutes is a function. Identify the domain and range.

GUITAR PRACTICE

Day	Minutes
Monday	25
Tuesday	30
Wednesday	25
Thursday	35

ANSWER _____

2

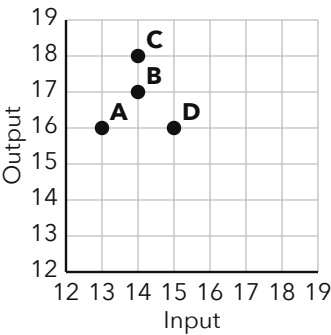
A music app records the number of songs in four playlists. The relation is $\{(5, 32), (6, 28), (7, 32), (8, 35)\}$, where the first number is the playlist number and the second number is the number of songs. Is the relation a function? Identify the domain and range.

WORK SPACE

ANSWER _____

CHALLENGE One step up

Maya says the graph is not a function because the output 16 is used twice. Is Maya correct? Decide whether the relation is a function, identify the domain and range, and explain why.



WORK SPACE AND ANSWER

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Is the relation $\{(1, 5), (5, 6), (6, 7)\}$ a function? Identify the domain and range.	Function; domain $\{1, 5, 6\}$; range $\{5, 6, 7\}$
2	Is the relation $\{(7, 1), (8, 5), (7, 9)\}$ a function? Identify the domain and range.	Not a function; domain $\{7, 8\}$; range $\{1, 5, 9\}$
3	Is the relation $\{(9, 8), (10, 8), (11, 12)\}$ a function? Identify the domain and range.	Function; domain $\{9, 10, 11\}$; range $\{8, 12\}$
4	Is the relation $\{(12, 6), (13, 7), (14, 6), (12, 9)\}$ a function? Identify the domain and range.	Not a function; domain $\{12, 13, 14\}$; range $\{6, 7, 9\}$
5	Is the relation $\{(15, 18), (16, 19), (17, 18)\}$ a function? Identify the domain and range.	Function; domain $\{15, 16, 17\}$; range $\{18, 19\}$
6	Is the relation $\{(20, 21), (21, 22), (22, 23), (23, 21)\}$ a function? Identify the domain and range.	Function; domain $\{20, 21, 22, 23\}$; range $\{21, 22, 23\}$

PART 2 • APPLY IT

- Function; domain $\{\text{Monday, Tuesday, Wednesday, Thursday}\}$; range $\{25, 30, 35\}$** Each day is paired with exactly one practice time. The repeated output of 25 minutes does not prevent the relation from being a function.
- Function; domain $\{5, 6, 7, 8\}$; range $\{28, 32, 35\}$** Every playlist number appears once, so each input has one output. List each output only once in the range.

CHALLENGE

Maya is not correct about why it is not a function. The relation is not a function because input 14 has two outputs, 17 and 18. Domain $\{13, 14, 15\}$; range $\{16, 17, 18\}$.

Accept domain and range values in any order. A repeated output is allowed in a function, but a repeated input with different outputs means the relation is not a function.