LESSON MAKER PRO

One Input, One Output

Decide when a relation is a function.

HIGH SCHOOL · A1P.AF.E.16

A1P.AF.E.16 "Compare and contrast relations and functions represented by equations, graphs, or tables that show related values; determine whether a relation is a function..."

NAME _____ DATE _____

THE FUNCTION TEST

A relation is a function if each input x has exactly one output y. An input can appear more than once, but its output must stay the same. For a function, write y = f(x).

WORKED EXAMPLE

Does the table show a function? Find f(-8) if it does.

x	y
-8	21
-9	25
-8	21
-6	23

1. The input -8 appears twice.
2. Both times, its output is 21.
3. Every input has just one output.

Answer: Yes, it is a function. f(-8) = 21.

PRACTICE 4 problems

1 For y = 3x - 4, is y a function of x? Find f(2).

ANSWER _____

2 Is $x = y^2$ a function of x? Give two outputs when x = 9.

ANSWER _____

3 Is {(0, 4), (1, 6), (0, 4), (2, 8)} a function?

ANSWER _____

4 Is {(-2, 5), (0, 4), (-2, 1)} a function? Explain.

ANSWER _____

APPLY IT Show your work

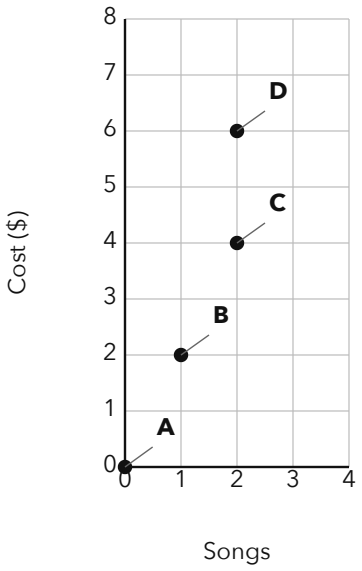
1 The table shows the cost of renting a VR headset. Is cost a function of hours rented? If so, find f(3).

VR HEADSET RENTAL

Hours	Cost ($)
1	7
2	10
3	13
4	16

ANSWER _____

2 A student compares music app checkout totals. Does the graph show cost as a function of songs purchased? Explain.



ANSWER _____

CHALLENGE One step up

Compare $y = 2x + 1$ for all real x with $R = \{(0, 1), (1, 3), (2, 5)\}$. Are both functions? Do they have the same domain? Explain.

WORK SPACE AND ANSWER

ANSWER KEY

One Input, One Output

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	For y = 3x - 4, is y a function of x? Find f(2).	**Yes. f(2) = 2.**
2	Is $x = y^2$ a function of x? Give two outputs when x = 9.	**No. When x = 9, y can be 3 or -3.**
3	Is {(0, 4), (1, 6), (0, 4), (2, 8)} a function?	**Yes.**
4	Is {(-2, 5), (0, 4), (-2, 1)} a function? Explain.	**No. The input -2 has two different outputs, 5 and 1.**

PART 2 · APPLY IT

1. **Yes. f(3) = 13, so three hours cost $13.** Each number of hours has one cost. The table pairs 3 hours with $13.
2. **No. Two songs have two different costs, $4 and $6.** The graph has two points with an input of 2 but different outputs.

CHALLENGE

Both are functions, but their domains differ. The equation allows every real x; R allows only 0, 1, and 2.

Accept equivalent explanations that use the one-output-per-input rule. In the challenge, matching outputs at the listed inputs do not make the domains the same.