LESSON MAKER PRO

One Input, One Output

Evaluate functions and check what makes a relation a function.

HIGH SCHOOL · FA.F.12

FA.F.12 "Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. Use function notation, where appropriate. (F-IF.1, F-IF.2)"

NAME _____ DATE _____

THE FUNCTION RULE

A function assigns each input in its domain exactly one output. To find f(a), replace x with a in the rule for f, then simplify. Different inputs may have the same output.

WORKED EXAMPLE

If f(x) = 7x + 9, find f(5).

1. Replace x with 5: f(5) = 7(5) + 9.
2. Multiply: f(5) = 35 + 9.
3. Add: f(5) = 44.

Answer: f(5) = 44

PRACTICE 6 problems

1 If f(x) = 2x + 1, find f(6).

ANSWER _____

2 If g(x) = x^2 - 4, find g(-2).

ANSWER _____

3 If h(x) = 12 - 2x, find h(4).

ANSWER _____

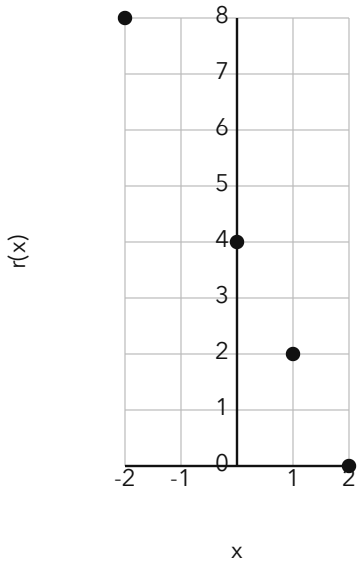
4 Use the table to find p(-2). Then find the input x for which p(x) = 4.

VALUES OF P

x	p(x)
-2	8
0	6
2	4
4	2

ANSWER _____

5 The plotted points show a function r. Find r(0) and r(1).



ANSWER _____

_____

6 Do the ordered pairs (0, 2), (1, 4), (1, 6), and (2, 8) define a function? Explain briefly.

ANSWER _____

_____

APPLY IT Show your work

1 A music app charges $6 for a monthly plan plus $2 for each song download. The monthly cost is C(s) = 6 + 2s, where s is the number of downloads. Find C(8) and explain what it means.

WORK SPACE

ANSWER _____

2 A gaming cafe charges $4 to enter and $3 for each full hour played. The total cost is G(h) = 4 + 3h. If G(h) = 16, how many hours did you play?

WORK SPACE

ANSWER _____

CHALLENGE One step up

Remove exactly one row from the table to make t a function. Give both rows you could remove and the value of t(1) for each choice. Explain why two different inputs may have the same output.

INPUT-OUTPUT PAIRS

x	t(x)
-1	6
0	4
1	6
1	8

WORK SPACE AND ANSWER

One Input, One Output

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	If f(x) = 2x + 1, find f(6).	**f(6) = 13**
2	If g(x) = x^2 - 4, find g(-2).	**g(-2) = 0**
3	If h(x) = 12 - 2x, find h(4).	**h(4) = 4**
4	Use the table to find p(-2). Then find the input x for which p(x) = 4.	**p(-2) = 8; x = 2**
5	The plotted points show a function r. Find r(0) and r(1).	**r(0) = 4; r(1) = 2**
6	Do the ordered pairs (0, 2), (1, 4), (1, 6), and (2, 8) define a function? Explain briefly.	**No. The input 1 has two different outputs, 4 and 6.**

PART 2 · APPLY IT

1. **C(8) = $22. Eight downloads cost $22 for the month, including the plan.** Substitute 8 for s: C(8) = 6 + 2(8) = 22.
2. **4 hours** Solve 4 + 3h = 16. Subtract 4, then divide by 3 to get h = 4.

CHALLENGE

Remove (1, 6), and t(1) = 8; or remove (1, 8), and t(1) = 6. Different inputs may share an output because a function requires only that each input have exactly one output.

Accept equivalent explanations for why the ordered pairs in problem 6 do not define a function. In the challenge, either order of the two valid choices is correct.