LESSON MAKER PRO

Function Clues

Find rules in tables, graphs, and stories

GRADE 8 · 8A.AF.H

8A.AF.H "Functions can be described by using a variety of representations: mapping diagrams, function notation (e.g., f(x) = x²), recursive definitions, tables, and graphs."

NAME _____ DATE _____

FIND THE RULE

A function gives each input exactly one output. In a table or graph, compare changes in the inputs and outputs to find a constant rate. A recursive rule uses one output to find the next.

WORKED EXAMPLE

Write a rule for the function in the table.

x	f(x)
11	37
13	43
15	49

1. When x rises by 2, f(x) rises by 6. The rate is 6/2 = 3.
2. Use the first row: 37 = 3(11) + 4.

Answer: f(x) = 3x + 4

PRACTICE 4 problems

1 If f(x) = 5x - 1, find f(0).

ANSWER _____

2 If g(x) = -7x + 9, find g(-1).

ANSWER _____

3 If h(x) = x + 12, find h(-5) and h(0).

ANSWER _____

_____

4 A function has t(0) = 9. For each next whole-number input, add 5 to the previous output. Find t(2).

ANSWER _____

APPLY IT Show your work

1 A music app charges a start fee plus a price per song. Use the table to write C(x), the cost in dollars for x songs. Then find C(6).

MUSIC APP COSTS

Songs (x)	Cost ($)
0	9
2	19
4	29

ANSWER _____

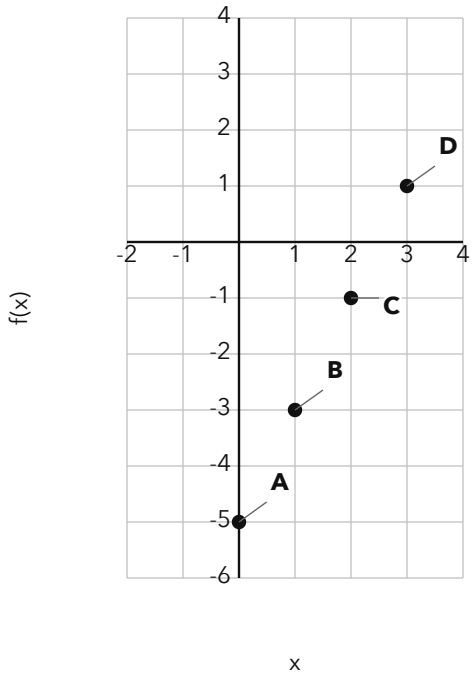
2 Your game score is 18 at level 0. You earn 7 more points at each new level. Write a recursive rule for S(x), your score at level x, and find S(2).

WORK SPACE

ANSWER _____

CHALLENGE One step up

Use the plotted points to write f(x) and find f(-2). Explain how you found the rule.



WORK SPACE AND ANSWER

ANSWER KEY

Function Clues

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	If f(x) = 5x - 1, find f(0).	**f(0) = -1**
2	If g(x) = -7x + 9, find g(-1).	**g(-1) = 16**
3	If h(x) = x + 12, find h(-5) and h(0).	**h(-5) = 7; h(0) = 12**
4	A function has t(0) = 9. For each next whole-number input, add 5 to the previous output. Find t(2).	**t(2) = 19**

PART 2 · APPLY IT

1. **C(x) = 5x + 9; C(6) = $39** The cost rises $10 for 2 songs, so each song costs $5. The cost at 0 songs is $9.
2. **S(0) = 18; S(x) = S(x - 1) + 7 for whole-number x > 0; S(2) = 32** Start with 18 points and add 7 for each level. The scores at levels 1 and 2 are 25 and 32.

CHALLENGE

f(x) = 2x - 5; f(-2) = -9. Each increase of 1 in x raises f(x) by 2, and f(0) = -5.

Accept equivalent notation for the recursive rule that states the starting value and adds 7 at each level. For the challenge, accept any explanation that identifies the rate of 2 and the value at x = 0.