LESSON MAKER PRO

Function Switchboard

Find rules from tables and graphs.

HIGH SCHOOL · A1P.AF.G

A1P.AF.G "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 one output for each input. For a linear function, divide the change in output by the change in input to find the rate, then use a pair to find the starting value. A recursive rule tells you how to get each new output from an earlier one.

WORKED EXAMPLE

Write a linear rule for the function in the table.

x	f(x)
6	31
7	35
8	39

1. The output rises by 4 when the input rises by 1, so the rate is 4.
2. Use (6, 31): 31 = 4(6) + b.
3. Solve for b: b = 7.

Answer: f(x) = 4x + 7

PRACTICE 4 problems

1 The pairs (0, 8), (1, 10), and (2, 12) belong to a linear function. Write its rule as f(x).

ANSWER _____

2 If f(x) = 5x - 4, find f(3).

ANSWER _____

3 Start with f(0) = 2. For whole-number inputs, f(x + 1) = f(x) + 6. Find f(3).

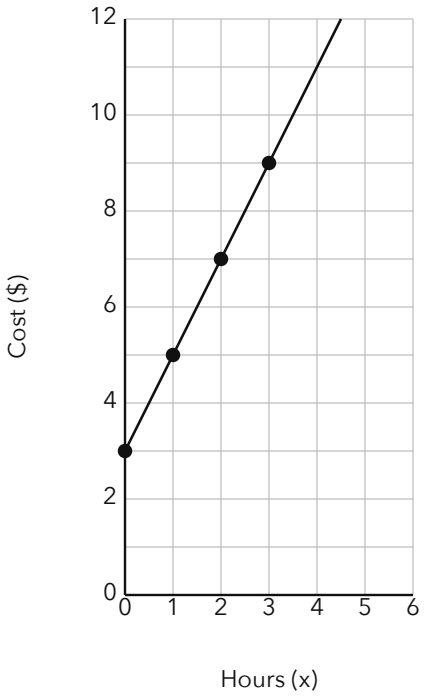
ANSWER _____

4 For f(x) = 3x + 2, which input gives an output of 29?

ANSWER _____

APPLY IT Show your work

1 The graph shows the cost of renting a game for x hours. Write C(x), then find the cost for 4 hours.



ANSWER _____

2 The table shows a creator's follower count after x weeks. Write F(x), then predict the count after 4 weeks.

FOLLOWERS

Weeks (x)	Followers
0	20
1	26
2	32

ANSWER _____

CHALLENGE One step up

Find a rule of the form $f(x) = ax^2 + b$ for the table. Explain how you found a and b.

x	f(x)
-2	9
0	1
2	9

WORK SPACE AND ANSWER

ANSWER KEY

Function Switchboard

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	The pairs (0, 8), (1, 10), and (2, 12) belong to a linear function. Write its rule as f(x).	**f(x) = 2x + 8**
2	If f(x) = 5x - 4, find f(3).	**11**
3	Start with f(0) = 2. For whole-number inputs, f(x + 1) = f(x) + 6. Find f(3).	**20**
4	For f(x) = 3x + 2, which input gives an output of 29?	**9**

PART 2 · APPLY IT

1. **C(x) = 2x + 3; $11** The graph crosses the cost axis at 3 and rises $2 per hour. Substitute 4 to get C(4) = 11.
2. **F(x) = 6x + 20; 44 followers** The count starts at 20 and rises by 6 each week. Substitute 4 to get F(4) = 44.

CHALLENGE

f(x) = 2x² + 1. Since f(0) = 1, b = 1. Using (2, 9), 9 = 4a + 1, so a = 2.

Accept equivalent rules and correct answers with or without units where the unit is clear.