LESSON MAKER PRO

Function Connections

Read graphs, build rules, and interpret outputs.

HIGH SCHOOL · A1.F.3

A1.F.3 "Represent functions in multiple ways and use the representation to interpret real-world and mathematical problems. Identify and generate equivalent representations of linear functions, graphs, tables, and real-world situations..."

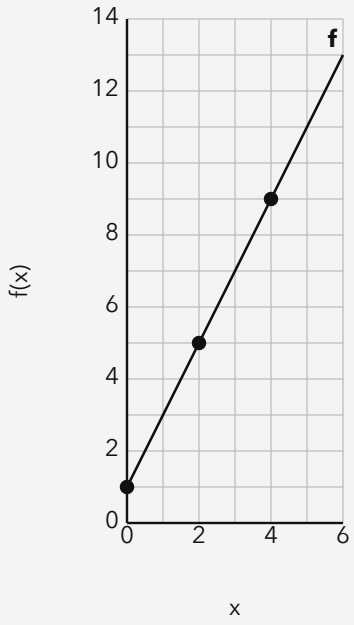
NAME _____ DATE _____

ONE FUNCTION, MANY VIEWS

A function's graph, table, and rule can all show the same relationship. On a graph, f(a) is the y-value where x = a. For a straight line, use its y-intercept and its change in y for each increase of 1 in x to write f(x) = mx + b.

WORKED EXAMPLE

Use the graph to write a rule for f(x), then find f(4).

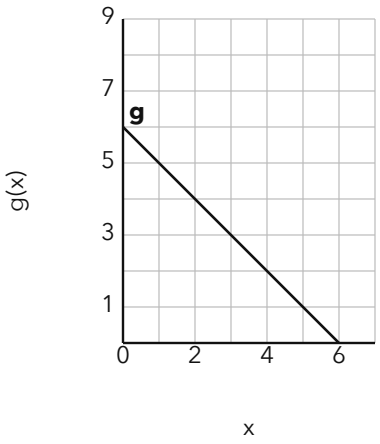


1. The line crosses the y-axis at 1.
2. From (0, 1) to (2, 5), y rises 4 while x increases 2, so the slope is 4/2 = 2.
3. Write f(x) = 2x + 1.
4. Find f(4) = 2(4) + 1 = 9.

Answer: f(x) = 2x + 1; f(4) = 9

PRACTICE 6 problems

1 Use the graph to write a rule for g(x) and find g(3).



ANSWER _____

2 The table shows a linear function h. Write a rule for h(x), then find h(5).

VALUES OF H

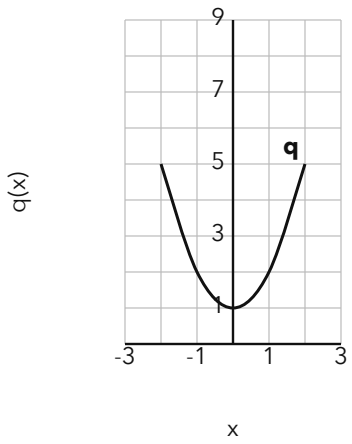
x	h(x)
-1	-7
0	-3
1	1
2	5

ANSWER _____

3 For $p(x) = x^2 - 4x + 2$, find p(-1).

ANSWER _____

4 Use the graph to find q(-2) and q(0).



ANSWER _____

5 Let f(x) = 5x - 4 and g(x) = x + 3. Find (f - g)(2).

ANSWER _____

6 Let a(x) = x - 4 and b(x) = x + 2. Find (ab)(3).

ANSWER _____

APPLY IT Show your work

1 A game cafe charges an $8 entry fee plus $5 per hour. Let C(x) be the cost, in dollars, for x hours. Write a rule for C(x), then find and interpret C(3).

WORK SPACE

ANSWER _____

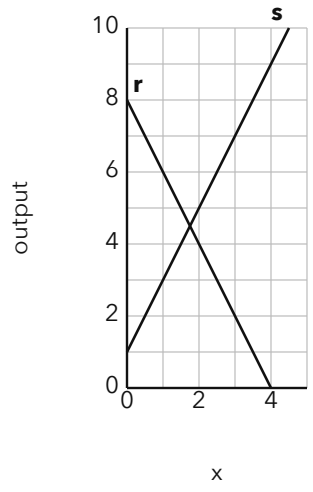
2 For a project, video files use V(x) = 8x + 5 MB and audio files use A(x) = 2x + 3 MB, where x is the number of minutes recorded. Find (V + A)(6) and explain what it means.

WORK SPACE

ANSWER _____

CHALLENGE One step up

Two linear functions, r and s, are graphed. At what exact value of x do they have the same output? Write a rule for each function and use the rules to find x.



WORK SPACE AND ANSWER

Function Connections

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Use the graph to write a rule for g(x) and find g(3).	**g(x) = -x + 6; g(3) = 3**
2	The table shows a linear function h. Write a rule for h(x), then find h(5).	**h(x) = 4x - 3; h(5) = 17**
3	For $p(x) = x^2 - 4x + 2$, find p(-1).	**7**
4	Use the graph to find q(-2) and q(0).	**q(-2) = 5; q(0) = 1**
5	Let f(x) = 5x - 4 and g(x) = x + 3. Find (f - g)(2).	**1**
6	Let a(x) = x - 4 and b(x) = x + 2. Find (ab)(3).	**-5**

PART 2 · APPLY IT

1. **C(x) = 5x + 8; C(3) = 23. Three hours at the cafe costs $23.** Add the $8 entry fee to $5 for each hour. Then evaluate 5(3) + 8 = 23.
2. **(V + A)(6) = 68 MB. Together, the video and audio files for 6 minutes use 68 MB.** Evaluate V(6) = 53 and A(6) = 15, then add their storage amounts.

CHALLENGE

r(x) = -2x + 8 and s(x) = 2x + 1. Set -2x + 8 = 2x + 1 to get 7 = 4x, so x = 7/4.

Accept equivalent linear rules and equivalent exact fractions. In the challenge, the shared output is 9/2, but only x = 7/4 is required.