LESSON MAKER PRO

Function Mix Lab

Combine functions, then use the results.

HIGH SCHOOL · A1.F.3.3

A1.F.3.3 "Add, subtract, and multiply functions using function notation."

NAME _____ DATE _____

COMBINE THE OUTPUTS

To add or subtract functions, add or subtract their outputs at the same input, then combine like terms. To multiply functions, multiply their outputs and distribute. The notation (fg)(x) means f(x) times g(x).

WORKED EXAMPLE

Let f(x)=7x+11 and g(x)=9x-13. Find (fg)(x).

1. (fg)(x)=(7x+11)(9x-13)
2. Distribute: $63x^2$-91x+99x-143
3. Combine like terms: $63x^2$+8x-143

Answer: (fg)(x)=$63x^2$+8x-143

PRACTICE 6 problems

1 Let f(x)=2x+5 and g(x)=3x-6. Find (f+g)(x).

ANSWER _____

2 Let a(x)=8x-3 and b(x)=x+10. Find (a+b)(-2).

ANSWER _____

3 Let f(x)=6x+1 and g(x)=2x-5. Find (f-g)(x).

ANSWER _____

4 Let m(x)=x^2+3x and n(x)=5x-8. Find (m-n)(x).

ANSWER _____

5 Let p(x)=x+2 and q(x)=x-6. Find (pq)(x).

ANSWER _____

6 Let h(x)=3x-2 and j(x)=x+5. Find (hj)(-1).

ANSWER _____

APPLY IT Show your work

1 The price of a hoodie x weeks after a drop is p(x)=12+2x dollars. The number sold that week is n(x)=30-x. Write (pn)(x), the weekly revenue in dollars, in simplified form. Then find the revenue when x=4.

WORK SPACE

ANSWER _____

2 Plan A costs A(x)=15+4x dollars per month, and Plan B costs B(x)=25+2x dollars per month, where x is the number of extra gigabytes used. Find (A-B)(x). How much more does Plan A cost than Plan B when x=6?

WORK SPACE

ANSWER _____

CHALLENGE One step up

Let f(x)=2x-3 and g(x)=x+5. Find every value of x for which (fg)(x)=0. Then find (f+g)(x) at each of those values.

WORK SPACE AND ANSWER

ANSWER KEY # Function Mix Lab

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Let f(x)=2x+5 and g(x)=3x-6. Find (f+g)(x).	**5x-1**
2	Let a(x)=8x-3 and b(x)=x+10. Find (a+b)(-2).	**-11**
3	Let f(x)=6x+1 and g(x)=2x-5. Find (f-g)(x).	**4x+6**
4	Let m(x)=x^2+3x and n(x)=5x-8. Find (m-n)(x).	**x^2-2x+8**
5	Let p(x)=x+2 and q(x)=x-6. Find (pq)(x).	**x^2-4x-12**
6	Let h(x)=3x-2 and j(x)=x+5. Find (hj)(-1).	**-20**

PART 2 · APPLY IT

1. **(pn)(x)=-2x^2+48x+360; revenue when x=4 is $520.** Multiply the price by the number sold to find the revenue function. At x=4, each hoodie costs $20 and 26 are sold, so revenue is $520.
2. **(A-B)(x)=2x-10; Plan A costs $2 more when x=6.** Subtract Plan B's cost from Plan A's cost to get 2x-10. At x=6, the difference is $2.

CHALLENGE

At x=3/2, (f+g)(x)=13/2. At x=-5, (f+g)(x)=-13.

Accept equivalent simplified expressions with terms in any order. In the challenge, the two x-values and their corresponding sums must be paired correctly.