Section 2.6   Combinations of Functions: Composite Functions

Objective: In this lesson you learned how to find arithmetic combinations and compositions of functions.

I. Arithmetic Combinations of Functions (Pages 214–215)

Just as two real numbers can be combined with arithmetic operations, two functions can be combined by the operations of

_____

to create new functions. A combined function like this is called an **arithmetic combination of functions.**

What you should learn
How to add, subtract, multiply, and divide functions

The domain of an arithmetic combination of functions f and g consists of . . .

Let f and g be two functions with overlapping domains.
Complete the following arithmetic combinations of f and g for all x common to both domains:

1) Sum: $(f + g)(x) =$ _____

2) Difference: $(f - g)(x) =$ _____

3) Product: $(fg)(x) =$ _____

4) Quotient: $\left(\dfrac{f}{g} \right)(x) =$ _____

Example: Let $f(x) = 7x - 5$ and $g(x) = 3 - 2x$. Find $(f - g)(4)$.

II. Composition of Functions (Pages 216–217)

The composition of the function f with the function g is defined as $(f \circ g)(x) =$ _____ .

What you should learn
How to find the composition of one function with another function

For the composition of the function f with g, the domain of
$(f \circ g)$ is . . .

For two functions f and g, to find $(f \circ g)(x)$, . . .

Example: Let $f(x) = 3x + 4$ and let $g(x) = 2x^2 - 1$. Find
(a) $(f \circ g)(x)$ and (b) $(g \circ f)(x)$.

III. Application (Page 218)

The function $f(x) = 0.06x$ represents the sales tax owed on a
purchase with a price tag of x dollars and the function
$g(x) = 0.75x$ represents the sale price of an item with a price tag
of x dollars during a 25% off sale. Using one of the combinations
of functions discussed in this section, write the function that
represents the sales tax owed on an item with a price tag of x
dollars during a 25% off sale.

> *What you should learn*
> How to use combinations
> of functions to model and
> solve real-life problems

Additional notes

Homework Assignment

Page(s)

Exercises