

## Section 1.5 Combinations of Functions

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

Course Number

Instructor

Date

### I. Arithmetic Combinations of Functions (Pages 51–53)

Just as two real numbers can be combined by the operations of addition, subtraction, multiplication, and division to form other real numbers, two functions  $f$  and  $g$  can be combined to create new functions such as the \_\_\_\_\_ of  $f$  and  $g$  to create new functions.

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

***What you should learn***

How to add, subtract, multiply, and divide functions

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:  $\left(\frac{f}{g}\right)(x) =$  \_\_\_\_\_

To use a graphing utility to graph the sum of two functions, . . .

**Example 1:** Let  $f(x) = 7x - 5$  and  $g(x) = 3 - 2x$ . Find  $(f - g)(4)$ .

**II. Compositions of Functions** (Pages 53–56)

The **composition** of the function  $f$  with the function  $g$  is

$$(f \circ g)(x) = \underline{\hspace{2cm}}.$$

For the composition of the function  $f$  with  $g$ , the domain of

$f \circ g$  is . . .

***What you should learn***

How to find compositions of one function with another function

**Example 2:** 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. Applications of Combinations of Functions** (Page 57)

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