

**DUE: A-day Tuesday 09/28/15, B-day Wednesday 09/29/15**

**Pre-Calculus: Lesson 1.5 Combinations of Functions p. 56 #11-31 odd, & 41-49 odd.**

Please complete the assignment using the “tri-fold” method (You may use [www.calcchat.com](http://www.calcchat.com) to check your work):

**Finding Arithmetic Combinations of Functions** In Exercises 11–18, find (a)  $(f + g)(x)$ , (b)  $(f - g)(x)$ , (c)  $(fg)(x)$ , and (d)  $(f/g)(x)$ . What is the domain of  $f/g$ ?

11.  $f(x) = x + 3$ ,  $g(x) = x - 3$

12.  $f(x) = 2x - 5$ ,  $g(x) = 1 - x$

✓ 13.  $f(x) = x^2$ ,  $g(x) = 1 - x$

14.  $f(x) = 2x - 5$ ,  $g(x) = 5$

15.  $f(x) = x^2 + 5$ ,  $g(x) = \sqrt{1 - x}$

16.  $f(x) = \sqrt{x^2 - 4}$ ,  $g(x) = \frac{x^2}{x^2 + 1}$

17.  $f(x) = \frac{1}{x}$ ,  $g(x) = \frac{1}{x^2}$

**Evaluating an Arithmetic Combination of Functions** In Exercises 19–32, evaluate the indicated function for  $f(x) = x^2 - 1$  and  $g(x) = x - 2$  algebraically. If possible, use a graphing utility to verify your answer.

19.  $(f + g)(3)$

20.  $(f - g)(-2)$

21.  $(f - g)(0)$

22.  $(f + g)(1)$

23.  $(fg)(6)$

24.  $(fg)(-4)$

25.  $(f/g)(-5)$

26.  $(f/g)(0)$

27.  $(f - g)(2t)$

28.  $(f + g)(t - 4)$

29.  $(fg)(-5t)$

30.  $(fg)(3t^2)$

31.  $(f/g)(-t)$

32.  $(f/g)(t + 2)$

**Compositions of Functions** In Exercises 41–44, find (a)  $f \circ g$ , (b)  $g \circ f$ , and, if possible, (c)  $(f \circ g)(0)$ .

- ✓ 41.  $f(x) = x^2$ ,  $g(x) = x - 1$   
42.  $f(x) = \sqrt[3]{x-1}$ ,  $g(x) = x^3 + 1$   
✓ 43.  $f(x) = 3x + 5$ ,  $g(x) = 5 - x$   
44.  $f(x) = x^3$ ,  $g(x) = \frac{1}{x}$

**Finding the Domain of a Composite Function** In Exercises 45–54, determine the domains of (a)  $f$ , (b)  $g$ , and (c)  $f \circ g$ . Use a graphing utility to verify your results.

- ✓ 45.  $f(x) = \sqrt{x+4}$ ,  $g(x) = x^2$   
46.  $f(x) = \sqrt{x+3}$ ,  $g(x) = \frac{x}{2}$   
47.  $f(x) = x^2 + 1$ ,  $g(x) = \sqrt{x}$   
48.  $f(x) = x^{1/4}$ ,  $g(x) = x^4$   
49.  $f(x) = \frac{1}{x}$ ,  $g(x) = x + 3$

**Compositions of Functions** In Exercises 41–44, find (a)  $f \circ g$ , (b)  $g \circ f$ , and, if possible, (c)  $(f \circ g)(0)$ .

- ✓ 41.  $f(x) = x^2$ ,  $g(x) = x - 1$   
42.  $f(x) = \sqrt[3]{x-1}$ ,  $g(x) = x^3 + 1$   
✓ 43.  $f(x) = 3x + 5$ ,  $g(x) = 5 - x$   
44.  $f(x) = x^3$ ,  $g(x) = \frac{1}{x}$

**Finding the Domain of a Composite Function** In Exercises 45–54, determine the domains of (a)  $f$ , (b)  $g$ , and (c)  $f \circ g$ . Use a graphing utility to verify your results.

- ✓ 45.  $f(x) = \sqrt{x+4}$ ,  $g(x) = x^2$   
46.  $f(x) = \sqrt{x+3}$ ,  $g(x) = \frac{x}{2}$   
47.  $f(x) = x^2 + 1$ ,  $g(x) = \sqrt{x}$   
48.  $f(x) = x^{1/4}$ ,  $g(x) = x^4$   
49.  $f(x) = \frac{1}{x}$ ,  $g(x) = x + 3$

