

# SECTION 4.7

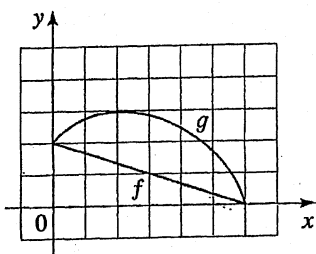
## EXERCISES

1-6 ■ Find  $f + g$ ,  $f - g$ ,  $fg$ , and  $f/g$  and their domains.

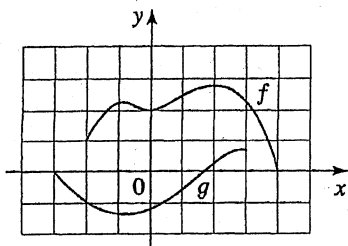
- $f(x) = x^2 - x$ ,  $g(x) = x + 5$
- $f(x) = x^3 + 2x^2$ ,  $g(x) = 3x^2 - 1$
- $f(x) = \sqrt{1+x}$ ,  $g(x) = \sqrt{1-x}$
- $f(x) = \sqrt{9-x^2}$ ,  $g(x) = \sqrt{x^2-1}$
- $f(x) = \frac{2}{x}$ ,  $g(x) = -\frac{2}{x+4}$
- $f(x) = \frac{1}{x+1}$ ,  $g(x) = \frac{x}{x+1}$

11-12 ■ Use graphical addition to sketch the graph of  $f + g$ .

11.



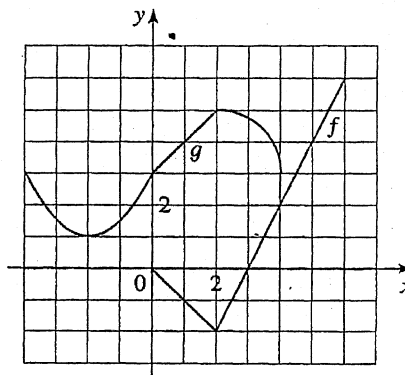
12.



17-22 ■ Use  $f(x) = 3x - 5$  and  $g(x) = 2 - x^2$  to evaluate the expression.

- |                           |                       |
|---------------------------|-----------------------|
| 17. (a) $f(g(0))$         | (b) $g(f(0))$         |
| 18. (a) $f(f(4))$         | (b) $g(g(3))$         |
| 19. (a) $(f \circ g)(-2)$ | (b) $(g \circ f)(-2)$ |
| 20. (a) $(f \circ f)(-1)$ | (b) $(g \circ g)(2)$  |
| 21. (a) $(f \circ g)(x)$  | (b) $(g \circ f)(x)$  |
| 22. (a) $(f \circ f)(x)$  | (b) $(g \circ g)(x)$  |

23-28 ■ Use the given graphs of  $f$  and  $g$  to evaluate the expression.



- $f(g(2))$
- $g(f(0))$
- $(g \circ f)(4)$
- $(f \circ g)(0)$
- $(g \circ g)(-2)$
- $(f \circ f)(4)$

29-40 ■ Find the functions  $f \circ g$ ,  $g \circ f$ ,  $f \circ f$ , and  $g \circ g$  and their domains.

29.  $f(x) = 2x + 3$ ,  $g(x) = 4x - 1$

30.  $f(x) = 6x - 5$ ,  $g(x) = \frac{x}{2}$

31.  $f(x) = x^2$ ,  $g(x) = x + 1$

32.  $f(x) = x^3 + 2$ ,  $g(x) = \sqrt[3]{x}$

33.  $f(x) = \frac{1}{x}$ ,  $g(x) = 2x + 4$

34.  $f(x) = x^2$ ,  $g(x) = \sqrt{x-3}$

35.  $f(x) = |x|$ ,  $g(x) = 2x + 3$

36.  $f(x) = x - 4$ ,  $g(x) = |x + 4|$

37.  $f(x) = \frac{x}{x+1}$ ,  $g(x) = 2x - 1$

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

39.  $f(x) = \sqrt[3]{x}$ ,  $g(x) = \sqrt[4]{x}$

40.  $f(x) = \frac{2}{x}$ ,  $g(x) = \frac{x}{x+2}$

41-44 ■ Find  $f \circ g \circ h$ .

41.  $f(x) = x - 1$ ,  $g(x) = \sqrt{x}$ ,  $h(x) = x - 1$

42.  $f(x) = \frac{1}{x}$ ,  $g(x) = x^3$ ,  $h(x) = x^2 + 2$

43.  $f(x) = x^4 + 1$ ,  $g(x) = x - 5$ ,  $h(x) = \sqrt{x}$

44.  $f(x) = \sqrt{x}$ ,  $g(x) = \frac{x}{x-1}$ ,  $h(x) = \sqrt[3]{x}$

45-50 ■ Express the function in the form  $f \circ g$ .

45.  $F(x) = (x - 9)^5$

46.  $F(x) = \sqrt{x} + 1$

47.  $G(x) = \frac{x^2}{x^2 + 4}$

48.  $G(x) = \frac{1}{x + 3}$

49.  $H(x) = |1 - x^3|$

50.  $H(x) = \sqrt{1 + \sqrt{x}}$