

1. Find $(f + g)(x)$.

$$f(x) = x + 4, g(x) = x - 4$$

- a. $2x$
- b. $4x$
- c. $-4x$
- d. $-2x$
- e. $2x + 8$

2. Find $(f - g)(x)$.

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

- a. $2x - 6$
- b. 6
- c. $2x - 3$
- d. $2x + 6$
- e. $2x$

3. Find $(f + g)(x)$.

$$f(x) = 2x - 3, g(x) = 4 - x$$

- a. $3x - 1$
- b. $2x - 1$
- c. $2x + 1$
- d. $3x + 1$
- e. $x + 1$

4. Find $(f - g)(x)$.

$$f(x) = 2x - 2, g(x) = 4 - x$$

- a. $3x - 6$
- b. $2x + 6$
- c. $2x - 6$
- d. $x - 6$
- e. $3x + 6$

5. Find $(fg)(x)$.

$$f(x) = x^2, g(x) = 7x - 7$$

- a. $7x^3 + 7x^2$
- b. $7x^3 - 7x^2$
- c. $7x^2 - 7x^3$
- d. $7x^2 + 7x^3$
- e. $7x - 7x^2$

6. Find $(f/g)(x)$. What is the domain of f/g ?

$$f(x) = x^2, g(x) = 7x - 3$$

- a. $\frac{x^2}{7x-3}$; all real numbers x .
- b. $\frac{7x+3}{x^2}$; all real numbers x except $x = 0$
- c. $\frac{x^2}{7x-3}$; all real numbers x except $x = \frac{3}{7}$
- d. $\frac{7x-3}{x^2}$; all real numbers x except $x = 0$
- e. $\frac{x^2}{7x+3}$; all real numbers x except $x = \frac{7}{3}$

7. Find $(f + g)(x)$.

$$f(x) = x^2 + 4, g(x) = \sqrt{7-x}$$

- a. $x^2 + 4 - \sqrt{7-x}$
- b. $x^2 + 4 + \sqrt{7-x}$

c. $x^2 - 4 + \sqrt{7+x}$

d. $x^2 - 4 - \sqrt{7-x}$

e. $x^2 - 4 + \sqrt{7-x}$

8. Find $(f-g)(x)$.

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

a. $x^2 + 3 + \sqrt{5-x}$

b. $x^2 - 3 + \sqrt{5-x}$

c. $x^2 - 3 + \sqrt{5+x}$

d. $x^2 + 3 - \sqrt{5-x}$

e. $x^2 - 3 - \sqrt{5-x}$

9. Find $(fg)(x)$.

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

a. $\frac{1}{x^4}$

b. $\frac{1}{x^2}$

c. $\frac{1}{x^6}$

d. x^6

e. $\frac{x^4}{x^2}$

10. Find $(f/g)(x)$.

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

- a. $\frac{1}{x^2}$
- b. x^6
- c. $\frac{1}{x^4}$
- d. $\frac{1}{x^6}$
- e. x^2

11. Evaluate the indicated function for $f(x) = x^2 + 2$ and $g(x) = x - 4$.

$(f + g)(3)$

- a. 12
- b. -10
- c. 7
- d. 14
- e. 10

12. Evaluate the indicated function for $f(x) = x^2 + 4$ and $g(x) = x - 6$.

$(f - g)(-6)$

- a. 40
- b. 52
- c. -52
- d. 216
- e. 26

13. Evaluate the indicated function for $f(x) = x^2 + 3$ and $g(x) = x - 6$.

$(f - g)(0)$

- a. 48
- b. 39
- c. 9

- d. 0
- e. -39

14. Evaluate the indicated function for $f(x) = x^2 + 3$ and $g(x) = x - 4$.

$(f - g)(3t)$

- a. $9t^2 + 3t + 7$
- b. $6t + 7$
- c. $9t^2 + 3t - 7$
- d. $9t^2 - 3t - 7$
- e. $9t^2 - 3t + 7$

15. Evaluate the indicated function for $f(x) = x^2 + 5$ and $g(x) = x - 2$.

$(fg)(5)$

- a. 92
- b. 90
- c. -86
- d. 89
- e. 91

16. Evaluate the indicated function for $f(x) = x^2 + 5$ and $g(x) = x - 4$.

$(f/g)(5)$

- a. 30
- b. $\frac{5}{34}$
- c. $\frac{32}{3}$
- d. $\frac{2}{31}$
- e. $\frac{34}{5}$

17. Evaluate the indicated function for $f(x) = x^2 + 6$ and $g(x) = x - 5$.

$$(f/g)(-4) - g(6)$$

- a. $\frac{5}{-26}$
- b. $\frac{31}{-9}$
- c. $\frac{9}{-13}$
- d. $\frac{13}{-9}$
- e. $\frac{9}{-31}$

18. Find $f \circ g$.

$$f(x) = x^4, g(x) = x - 5$$

- a. x^4
- b. $(x - 5)^4$
- c. $(x + 5)^4$
- d. $x^4 - 5$
- e. $x^4 + 5$

19. Find $g \circ f$.

$$f(x) = x^3, g(x) = x - 1$$

- a. $x^3 - 1$
- b. x^3
- c. $(x - 1)^3$
- d. $x^3 + 1$
- e. $(x + 1)^3$

20. Find $g \circ g$.

$$g(x) = x - 2$$

- a. $(x - 2)^2$
- b. $x^2 - 2$
- c. $x + 4$
- d. $-x - 4$
- e. $x - 4$

21. Find $f \circ g$ and the domain of the composite function.

$$f(x) = \sqrt{x+2}, g(x) = x^2$$

- a. $(x+2)^2$
Domain of $f \circ g$: all real numbers x
- b. $\sqrt{x^2+2}$
Domain of $f \circ g$: all real numbers x
- c. $-\sqrt{(x+2)^2}$
Domain of $f \circ g$: all real numbers x
- d. $(x-2)^2$
Domain of $f \circ g$: all real numbers x
- e. $\sqrt{(x-2)^2}$
Domain of $f \circ g$: all real numbers x

22. Find $g \circ f$ and the domain of the composite function.

$$f(x) = x^2 + 4, g(x) = \sqrt{x}$$

- a. $(x+4)^4$
Domain of $g \circ f$: all real numbers x
- b. $(x-4)^4$

Domain of $g \circ f$: all real numbers x

c. $\sqrt{x^2+4}$

Domain of $g \circ f$: all real numbers x

d. $\sqrt{(x-4)^4}$

Domain of $g \circ f$: all real numbers x

e. $\sqrt{(x+4)^4}$

Domain of $g \circ f$: all real numbers x

23. Find $f \circ g$ and the domain of the composite function.

$$f(x) = |x|, g(x) = x + 3$$

a. $|(x-3)^3|$

Domain of $f \circ g$: all real numbers x

b. $\sqrt{(x+3)^3}$

Domain of $f \circ g$: all real numbers x

c. $|x+3|$

Domain of $f \circ g$: all real numbers x

d. $|(x+3)^3|$

Domain of $f \circ g$: all real numbers x

e. $|x-3|$

Domain of $f \circ g$: all real numbers x

24. Find $g \circ f$ and the domain of the composite function.

$$f(x) = |x|, g(x) = x + 1$$

a. $|x-1|$

Domain of $g \circ f$: all real numbers x

b. $x-1$

Domain of $g \circ f$: all real numbers x
c. $|x| - 1$

Domain of $g \circ f$: all real numbers x
d. $|x| + 1$

Domain of $g \circ f$: all real numbers x
e. $|x + 1|$

Domain of $g \circ f$: all real numbers x

25. Find $f \circ g$ and the domain of the composite function.

$$f(x) = \frac{1}{x}, g(x) = x + 7$$

a. $\frac{1}{x} + 7$

Domain of $f \circ g$: all real numbers x except $x = 0$

b. $-\frac{1}{x+7}$

Domain of $f \circ g$: all real numbers x except $x = -7$

c. $\frac{1}{x+7}$

Domain of $f \circ g$: all real numbers x except $x = -7$

d. $\frac{1}{x} - 7$

Domain of $f \circ g$: all real numbers x except $x = 0$

e. $\frac{1}{x-7}$

Domain of $f \circ g$: all real numbers x except $x = 7$

26. The research and development department of an automobile manufacturer has determined that when a driver

is required to stop quickly to avoid an accident, the distance (in feet) the car travels during the driver's reaction time is given by $R(x) = \frac{5}{2}x$, where x is the speed of the car in miles per hour. The distance (in feet) traveled

while the driver is braking is given by $B(x) = \frac{1}{11}x^2$. Find the function that represents the total stopping distance T .

a. $T = -\frac{5}{2}x + \frac{1}{11}x^2$

b. $T = \frac{5}{2}x - \frac{1}{11}x^2$

c. $T = \frac{5}{2}x^2 + \frac{1}{11}x^2$

d. $T = -\frac{5}{2}x - \frac{1}{11}x^2$

e. $T = \frac{5}{2}x + \frac{1}{11}x^2$

27. The total numbers of Navy personnel N (in thousands) and Marines personnel M (in thousands) from 2000 through 2007 can be approximated by the models

$$N(t) = 0.193t^3 - 3.88t^2 + 15.9t + 370 \quad \text{and} \quad M(t) = 0.033t^3 - 0.21t^2 + 1.7t + 171$$

where t represents the year, with $t = 0$ corresponding to 2000.

Find and interpret $(N+M)(t)$.

a. $(N+M)(t) = 0.226t^3 + 4.09t^2 - 17.6t - 541$, which represents the total number of Navy and Marines personnel combined.

b. $(N+M)(t) = 0.226t^3 + 4.09t^2 + 17.6t + 541$, which represents the total number of Navy and Marines personnel combined.

c. $(N+M)(t) = 0.226t^3 - 4.09t^2 - 17.6t - 541$, which represents the total number of Navy and Marines personnel combined.

d. $(N+M)(t) = 0.226t^3 - 4.09t^2 + 17.6t + 541$, which represents the total number of Navy and Marines personnel combined.

e. $(N+M)(t) = 0.226t^2 - 4.09t^3 - 17.6t + 541$, which represents the total number of Navy and Marines personnel combined.

28. The spread of a contaminant is increasing in a circular pattern on the surface of a lake. The radius of the contaminant can be modeled by $r(t) = 2.25\sqrt{t}$, where r is the radius in meters and t is the time in hours since contamination.

Find a function that gives the area A of the circular contaminant in terms of the time since the spread began.

- a. $A \circ r(t) = 5.0625 \pi \sqrt{t}$
- b. $A \circ r(t) = 2.25 \pi t$
- c. $A \circ r(t) = 5.0625 t$
- d. $A \circ r(t) = 5.0625 \sqrt{t}$
- e. $A \circ r(t) = 5.0625 \pi t$

29. Find $(f/g)(x)$.

$$f(x) = x^2 - 4x \quad g(x) = 7 - x$$

- a. $(f/g)(x) = \frac{x^2 - 4x}{7 - x}, x \neq 0$
- b. $(f/g)(x) = \frac{x - 4}{7}, x \neq 0$
- c. $(f/g)(x) = \frac{x^2}{7} + 4, x \neq 0$
- d. $(f/g)(x) = \frac{x^2 - 4x}{7 - x}, x \neq 7$
- e. $(f/g)(x) = \frac{x^2 - 4x}{7 - x}, x \neq -7$

30. Find $f \circ g$.

$$f(x) = x + 3 \quad g(x) = \frac{1}{x^2 - 9}$$

a. $(f \circ g)(x) = \frac{1}{x^2}$

b. $(f \circ g)(x) = \frac{4}{x^2 - 9}$

c. $(f \circ g)(x) = \frac{3x^2 - 2}{x^2 - 9}$

d. $(f \circ g)(x) = \frac{1}{x^2 + 6x}$

e. $(f \circ g)(x) = \frac{3x^2 - 26}{x^2 - 9}$

31. Let $f(x) = 2x + 1$, $g(x) = 3x - 2$. Find the function.

$$(f - g)(x)$$

a. $(f - g)(x) = \frac{2x + 1}{3x - 2}$

b. $(f - g)(x) = 3 - x$

c. $(f - g)(x) = 6x^2 - x - 2$

d. $(f - g)(x) = 5x - 1$

e. none of the above

32. Let $f(x) = 2x - 1$, $g(x) = 3x - 2$. Find the domain of the function.

$$(f + g)(x)$$

a. $(-\infty, \infty)$

b. $[0, \infty)$

- c. $(-\infty, 0]$
- d. $(-\infty, 0)$
- e. $(0, \infty)$

35. Find $f \circ g$.

$$f(x) = |x^2 + 1| \quad g(x) = 9 - x$$

- a. $(f \circ g)(x) = |x^2 - 18x + 82|$
- b. $(f \circ g)(x) = |x^2 + 82|$
- c. $(f \circ g)(x) = |8 - x^2|$
- d. $(f \circ g)(x) = |10 - x^2|$
- e. $(f \circ g)(x) = 9 - |x^2 + 1|$