

Unit 9.5 Multiply and Divide Operations with Functions EXAMPLE

Perform the indicated operation.

1) $g(x) = 3x^2 - 2$
 $h(x) = 3x + 4$
 Find $(g + 5h)(x)$

2) $g(t) = -3t - 3$
 $f(t) = t^3 - 2t^2$
 Find $(5g + 5f)(t)$

3) $g(x) = x^3 - 2x^2$
 Find $g(g(x))$

4) $g(t) = 4t - 4$
 $f(t) = -3t^3 - 4$
 Find $(g \circ f)(t)$

5) $f(n) = n^3 + 5n$
 $g(n) = 2n + 2$
 Find $f(g(n))$

6) $g(x) = x^3 + 2$
 $h(x) = 2x + 3$
 Find $4g(x) - 2h(x)$

7) $f(x) = 4x + 3$
 $g(x) = -3x^2 + 4$
 Find $(f \circ g)(x)$

8) $f(x) = -2x^2 + 1$
 $g(x) = 4x - 5$
 Find $f(g(x))$

9) $g(n) = 2n - 4$
 $h(n) = 3n - 1$
 Find $g(h(6))$

10) $g(x) = 4x - 5$
 $h(x) = -x - 4$
 Find $4g(8) + 2h(8)$

11) $g(x) = x + 3$
 $f(x) = x + 1$
 Find $(g - 5f)(8)$

12) $f(n) = 2n - 5$
 $g(n) = n^2 - 5$
 Find $4f(7) - g(7)$

13) $f(x) = -x^2 - 4 + 2x$
 $g(x) = x + 2$
 Find $(f \circ g)(-7)$

14) $f(n) = 4n + 4$
 $g(n) = n^2 + n$
 Find $(f \circ g)(3)$

15) $f(t) = -2t + 1$
 $g(t) = 3t - 1$
 Find $(f + 5g)(8)$

16) $g(x) = 3x - 2$
 $f(x) = x^3 - x^2$
 Find $2g(2) - 3f(2)$

17) $g(t) = t - 2$
 $f(t) = 2t + 4$
 Find $g(-2t) - 4f(-2t)$

18) $f(x) = -4x + 4$
 $g(x) = 2x + 4$
 Find $(f \circ g)\left(\frac{x}{4}\right)$

19) $g(x) = x + 2$
 $h(x) = 3x + 4$
 Find $(4g - 2h)(4x)$

20) $g(x) = x^2 + 1$
 $f(x) = 4x + 2$
 Find $(g \circ f)(-2 - x)$

21) $f(x) = x^2 + 2x$
 $g(x) = -3x + 4$
 Find $(5f + 4g)(x + 2)$

22) $f(a) = a^2 + 4$
 $g(a) = -3a + 1$
 Find $(f \circ g)(x - 1)$

23) $f(x) = 2x - 3$
 $g(x) = x^3 - 5$
 Find $(f - 3g)(b - 1)$

24) $h(x) = -3x + 2$
 $g(x) = x^3 - 2x$
 Find $3h(-x) - 5g(-x)$

Unit 9.5 Multiply and Divide Operations with Functions EXAMPLE

Perform the indicated operation.

$$1) \begin{aligned} g(x) &= 3x^2 - 2 \\ h(x) &= 3x + 4 \\ \text{Find } (g + 5h)(x) \end{aligned}$$

$$3x^2 + 15x + 18$$

$$2) \begin{aligned} g(t) &= -3t - 3 \\ f(t) &= t^3 - 2t^2 \\ \text{Find } (5g + 5f)(t) \end{aligned}$$

$$5t^3 - 10t^2 - 15t - 15$$

$$3) \begin{aligned} g(x) &= x^3 - 2x^2 \\ \text{Find } g(g(x)) \end{aligned}$$

$$x^9 - 6x^8 + 12x^7 - 10x^6 + 8x^5 - 8x^4$$

$$4) \begin{aligned} g(t) &= 4t - 4 \\ f(t) &= -3t^3 - 4 \\ \text{Find } (g \circ f)(t) \end{aligned}$$

$$-12t^3 - 20$$

$$5) \begin{aligned} f(n) &= n^3 + 5n \\ g(n) &= 2n + 2 \\ \text{Find } f(g(n)) \end{aligned}$$

$$8n^3 + 24n^2 + 34n + 18$$

$$6) \begin{aligned} g(x) &= x^3 + 2 \\ h(x) &= 2x + 3 \\ \text{Find } 4g(x) - 2h(x) \end{aligned}$$

$$4x^3 - 4x + 2$$

$$7) \begin{aligned} f(x) &= 4x + 3 \\ g(x) &= -3x^2 + 4 \\ \text{Find } (f \circ g)(x) \end{aligned}$$

$$-12x^2 + 19$$

$$8) \begin{aligned} f(x) &= -2x^2 + 1 \\ g(x) &= 4x - 5 \\ \text{Find } f(g(x)) \end{aligned}$$

$$-32x^2 + 80x - 49$$

$$9) \begin{aligned} g(n) &= 2n - 4 \\ h(n) &= 3n - 1 \\ \text{Find } g(h(6)) \end{aligned}$$

$$30$$

$$10) \begin{aligned} g(x) &= 4x - 5 \\ h(x) &= -x - 4 \\ \text{Find } 4g(8) + 2h(8) \end{aligned}$$

$$84$$

$$11) \begin{aligned} g(x) &= x + 3 \\ f(x) &= x + 1 \\ \text{Find } (g - 5f)(8) \end{aligned}$$

$$-34$$

$$12) \begin{aligned} f(n) &= 2n - 5 \\ g(n) &= n^2 - 5 \\ \text{Find } 4f(7) - g(7) \end{aligned}$$

$$-8$$

13) $f(x) = -x^2 - 4 + 2x$
 $g(x) = x + 2$
 Find $(f \circ g)(-7)$
-39

14) $f(n) = 4n + 4$
 $g(n) = n^2 + n$
 Find $(f \circ g)(3)$
52

15) $f(t) = -2t + 1$
 $g(t) = 3t - 1$
 Find $(f + 5g)(8)$
100

16) $g(x) = 3x - 2$
 $f(x) = x^3 - x^2$
 Find $2g(2) - 3f(2)$
-4

17) $g(t) = t - 2$
 $f(t) = 2t + 4$
 Find $g(-2t) - 4f(-2t)$
 $14t - 18$

18) $f(x) = -4x + 4$
 $g(x) = 2x + 4$
 Find $(f \circ g)\left(\frac{x}{4}\right)$
 $-2x - 12$

19) $g(x) = x + 2$
 $h(x) = 3x + 4$
 Find $(4g - 2h)(4x)$
 $-8x$

20) $g(x) = x^2 + 1$
 $f(x) = 4x + 2$
 Find $(g \circ f)(-2 - x)$
 $16x^2 + 48x + 37$

21) $f(x) = x^2 + 2x$
 $g(x) = -3x + 4$
 Find $(5f + 4g)(x + 2)$
 $5x^2 + 18x + 32$

22) $f(a) = a^2 + 4$
 $g(a) = -3a + 1$
 Find $(f \circ g)(x - 1)$
 $9x^2 - 24x + 20$

23) $f(x) = 2x - 3$
 $g(x) = x^3 - 5$
 Find $(f - 3g)(b - 1)$
 $-3b^3 + 9b^2 - 7b + 13$

24) $h(x) = -3x + 2$
 $g(x) = x^3 - 2x$
 Find $3h(-x) - 5g(-x)$
 $5x^3 - x + 6$