

## 1-6: Function Operations

Perform the indicated operation. Find the domain.

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

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

$$\begin{aligned} 3) \quad & f(a) = 4a + 1 \\ & g(a) = 2a - 2 \\ & \text{Find } (f \cdot g)(a) \end{aligned}$$

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

$$\begin{aligned} 5) \quad & f(t) = 4t - 2 \\ & g(t) = t^3 + 4t^2 + t \\ & \text{Find } (f + g)(t) \end{aligned}$$

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

$$\begin{aligned} 7) \quad & g(t) = 3t - 5 \\ & f(t) = t^3 + 2t \\ & \text{Find } (g - f)(t) \end{aligned}$$

$$\begin{aligned} 8) \quad & g(x) = -3x \\ & h(x) = 2x^3 + 2x \\ & \text{Find } (g + h)(x) \end{aligned}$$

$$\begin{aligned} 9) \quad & g(x) = 2x + 2 \\ & f(x) = 4x + 4 \\ & \text{Find } (g \cdot f)(x) \end{aligned}$$

$$\begin{aligned} 10) \quad & g(x) = 3x^2 - 4x \\ & h(x) = x + 2 \\ & \text{Find } (g + h)(x) \end{aligned}$$

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11)  $h(a) = 2a^2 - 5a$   
 $g(a) = a - 3$   
Find  $(h - g)(5)$

12)  $f(x) = 2x + 3$   
 $g(x) = 4x + 5$   
Find  $(f - g)(-10)$

13)  $g(x) = 2x - 3$   
 $f(x) = 4x + 2$   
Find  $(g - f)(10)$

14)  $g(n) = 4n$   
 $f(n) = 2n^2 - n$   
Find  $(g + f)(1)$

15)  $h(x) = 4x - 2$   
 $g(x) = x - 1$   
Find  $(h - g)(7)$

16)  $f(t) = -4t - 2$   
 $g(t) = 3t^2 + 5t$   
Find  $(f + g)\left(\frac{t}{4}\right)$

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

18)  $g(t) = 4t + 2$   
 $h(t) = -3t^2 - 3t$   
Find  $(g + h)(-4t)$

19)  $h(n) = -2n + 1$   
 $g(n) = n - 1$   
Find  $(h - g)(-n)$

20)  $h(n) = n + 2$   
 $g(n) = n^3 + 2n$   
Find  $(h + g)(2n)$

## 1-6: Building Functions from Functions WS1

Perform the indicated operation.

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

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

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

$$\begin{aligned} 4) \quad & f(n) = 3n^2 - 1 \\ & g(n) = 2n - 5 \\ & \text{Find } f(n) \cdot g(n) \end{aligned}$$

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

$$\begin{aligned} 6) \quad & f(x) = -3x^3 + 2 \\ & g(x) = 2x - 5 \\ & \text{Find } f(x) \cdot g(x) \end{aligned}$$

$$\begin{aligned} 7) \quad & g(x) = 3x + 2 \\ & f(x) = x^2 - 5x \\ & \text{Find } (g \circ f)(x) \end{aligned}$$

$$\begin{aligned} 8) \quad & f(x) = 2x + 4 \\ & \text{Find } (f \circ f)(x) \end{aligned}$$

$$\begin{aligned} 9) \quad & g(x) = x^2 + 1 \\ & h(x) = 2x \\ & \text{Find } g(h(x)) \end{aligned}$$

$$\begin{aligned} 10) \quad & f(a) = 2a - 5 \\ & g(a) = 2a^2 - 3a \\ & \text{Find } (f \circ g)(a) \end{aligned}$$

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$$11) \begin{aligned} g(n) &= n^2 + 4n \\ h(n) &= 2n - 2 \\ \text{Find } (g \circ h)(n) \end{aligned}$$

$$12) \begin{aligned} g(a) &= 4a + 1 \\ h(a) &= 2a + 5 \\ \text{Find } g(h(a)) \end{aligned}$$

Find  $f$  and  $g$  so that  $h(x) = (f \circ g)(x)$ . Neither function may be the identity function  $f(x) = x$ .

$$13) h(x) = (2\sqrt{x} + 2)^2$$

$$14) h(x) = \sqrt{x^3} + 1$$

$$15) h(x) = (5x + 3)^2$$

$$16) h(x) = \sqrt{x^2} + 3$$

Perform the indicated operation.

$$17) \begin{aligned} g(x) &= 4x - 2 \\ h(x) &= -4x - 1 \\ \text{Find } g(-4) - h(-4) \end{aligned}$$

$$18) \begin{aligned} g(x) &= 3x \\ f(x) &= -3x^2 - 5x \\ \text{Find } \left(\frac{g}{f}\right)(-10) \end{aligned}$$

$$19) \begin{aligned} h(x) &= 3x - 3 \\ g(x) &= 4x - 2 \\ \text{Find } h(g(2 + x)) \end{aligned}$$

$$20) \begin{aligned} f(x) &= x^2 - 3 \\ g(x) &= 2x - 5 \\ \text{Find } (f + g)(x^2) \end{aligned}$$

## 1-6 Function Operations and Composition

Perform the indicated operation.

1)  $g(n) = n + 4$   
 $h(n) = n - 5$   
Find  $g(n) \div h(n)$

2)  $h(x) = 4x - 1$   
 $g(x) = x + 4$   
Find  $h(x) \cdot g(x)$

3)  $g(t) = -2t - 2$   
 $h(t) = t^3 - 3t$   
Find  $\left(\frac{g}{h}\right)(t)$

4)  $f(x) = 4x + 2$   
 $g(x) = x^2 - 5$   
Find  $\left(\frac{f}{g}\right)(x)$

5)  $g(x) = x^2 + 5x$   
 $f(x) = 2x - 3$   
Find  $(g \cdot f)(x)$

6)  $g(x) = -3x^2 - 5x$   
 $f(x) = 4x - 4$   
Find  $g(-3) \cdot f(-3)$

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

8)  $g(x) = -3x$   
 $f(x) = 3x + 4$   
Find  $g(6) + f(6)$

9)  $g(x) = x^2 - 6x$   
 $f(x) = -x$   
Find  $(g + f)(-4)$

10)  $g(x) = x + 1$   
 $h(x) = x^2 - 2$   
Find  $g(-2) \div h(-2)$

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11)  $g(t) = -3t^3 + 5$   
 $f(t) = 2t - 1$   
Find  $(g + f)(t)$

12)  $f(x) = 3x - 2$   
 $g(x) = x + 2$   
Find  $f(g(x))$

13)  $g(t) = 2t + 5$   
 $h(t) = 3t^2 + 3t$   
Find  $g(t) + h(t)$

14)  $h(x) = x^2 + 4$   
Find  $h(h(x))$

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

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

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

18)  $h(n) = n^2 + 3$   
Find  $h(h(3))$

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

20)  $g(n) = n^2 - 4$   
 $h(n) = n - 1$   
Find  $(g \circ h)(-6)$