

Section 1.4 WS

Perform the indicated operation.

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

2) $f(x) = -x^2 + 1$
 $g(x) = 3x - 2$
Find $f(x) + g(x)$

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

4) $f(n) = 2n + 5$
 $g(n) = -2n - 4$
Find $f(n) - g(n)$

5) $f(a) = 4a$
 $g(a) = -2a + 5$
Find $f(a) \cdot g(a)$

6) $f(a) = a - 2$
 $g(a) = 3a + 3$
Find $f(a) \cdot g(a)$

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

8) $g(n) = n - 3$
 $f(n) = n^2 + 5n$
Find $\frac{g(n)}{f(n)}$

9) $g(t) = -t^2 - 5t$
 $f(t) = 3t - 2$
Find $\frac{g(t)}{f(t)}$

10) $g(n) = n - 1$
 $h(n) = n^2 + 4$
Find $g(n) \div h(n)$

11) $h(n) = 3n - 2$
 $g(n) = n - 4$
Find $h(g(n))$

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

13) $f(n) = n^2 - 3n$
 $g(n) = 4n + 1$
Find $f(g(n))$

14) $g(x) = 3x + 2$
Find $g(g(x))$

Find the inverse of each function.

15) $f(x) = \frac{x+3}{2}$

16) $f(x) = -\frac{3}{5}x + \frac{9}{5}$

17) $g(x) = \sqrt[3]{x+1}$

18) $f(x) = -(x+2)^5$

Prove if the given functions are inverses. *HINT: $f \circ g = g \circ f = x$**

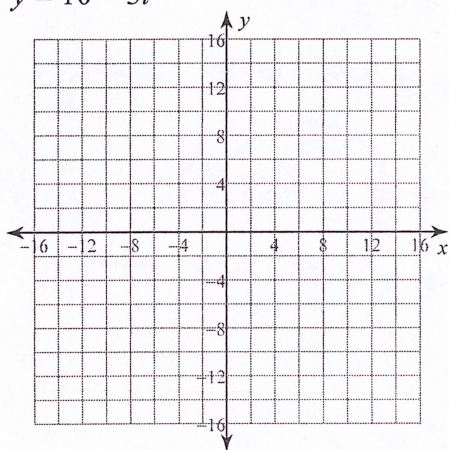
19) $f(x) = \frac{x-3}{4}$
 $g(x) = 4x + 3$

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

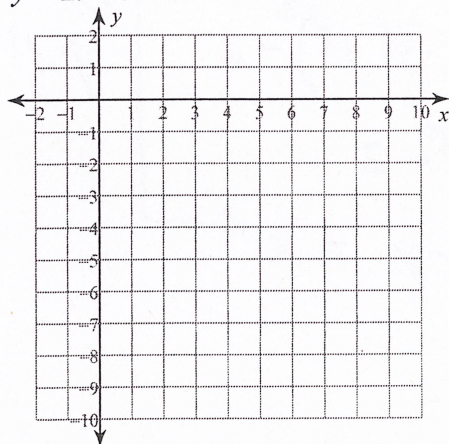
$$21) \begin{aligned} f(x) &= (x+1)^2 - 3 \\ h(x) &= \sqrt{\frac{x-1}{3}} \end{aligned}$$

$$22) \begin{aligned} g(x) &= \sqrt[3]{x+2} - 1 \\ f(x) &= (x+1)^3 - 2 \end{aligned}$$

- 23) Find the (x, y) pairs for the parameter values of $t = -2, -1, 0, 1, 2$. Then, graph the relation.
 $x = 5t^2 - 7$
 $y = 10 - 3t$



- 24) Find the (x, y) pairs for the parameter values of $t = -2, -1, 0, 1, 2$. Then, graph the relation.
 $x = |t - 1|$
 $y = 2t - 5$



Answers to Section 1.4 WS

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|---|---|---|------------------------------------|
| 1) $-2t^2 - 3t - 1$ | 2) $-x^2 + 3x - 1$ | 3) $2t^3 - 3t + 5$ | 4) $4n + 9$ |
| 5) $-8a^2 + 20a$ | 6) $3a^2 - 3a - 6$ | 7) $3x^3 - 2x^2 - 15x + 10$ | |
| 8) $\frac{n-3}{n^2+5n}; n \neq 0 \text{ \& } n \neq -5$ | 9) $\frac{-t^2-5t}{3t-2}; n \neq \frac{2}{3}$ | 10) $\frac{n-1}{n^2+4}$ | |
| 11) $3n - 14$ | 12) $4x^2 + 16$ | 13) $16n^2 - 4n - 2$ | 14) $9x + 8$ |
| 15) $f^{-1}(x) = 2x - 3$ | 16) $f^{-1}(x) = 3 - \frac{5}{3}x$ | 17) $g^{-1}(x) = -1 + x^3$ | 18) $f^{-1}(x) = -\sqrt[5]{x} - 2$ |
| 19) Yes | 20) Yes | 21) No | 22) Yes |
| 23) (13, 16), (-2, 13), (-7, 10), (-2, 7), (13, 4) | | 24) (3, -9), (2, -7), (1, -5), (0, -3), (1, -1) | |

#19 $f \circ g = g \circ f = x$

$$f \circ g = \frac{(4x+3) - 3}{4} = \frac{4x}{4} = x$$

$$g \circ f = 4\left(\frac{x-3}{4}\right) + 3 = x - 3 + 3 = x$$

#20

$$f \circ g = 3\left(-3 + \frac{1}{3}x\right) + 9$$

$$-9 + x + 9 = x$$

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

$$-3 + x + 3 = x$$

#21

$$f \circ g: \left(\sqrt{\frac{x-1}{3}} + 1\right)^2 - 3$$

FOIL!

$$\frac{x-1}{3} + 2\left(\sqrt{\frac{x-1}{3}}\right) + 1 - 3$$

This will Not equal x !

NO

#22

$$f \circ g: \sqrt[3]{(x+1)^3 - 2} + 2 - 1$$

$$\sqrt[3]{(x+1)^3} - 1$$

$$x+1-1 = x$$

$$g \circ f: \left(\sqrt[3]{x+2} - 1 + 1\right)^3 - 2$$

$$\left(\sqrt[3]{x+2}\right)^3 - 2$$

$$x+2-2 = x$$