

Functions Notes

Evaluate each function.

1) $h(n) = n + 4$; Find $h(-9)$

$$h(-9) = -9 + 4$$

$$h(-9) = \boxed{-5}$$

2) $h(a) = a^2 + 3$; Find $h(4)$

$$h(4) = 4^2 + 3$$

$$h(4) = 16 + 3$$

$$h(4) = \boxed{19}$$

3) $w(x) = 2x + 2$; Find $w(7)$

$$= 2(7) + 2$$

$$= 14 + 2$$

$$= \boxed{16}$$

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

$$= 3^3 + 5(3)^2$$

$$= 27 + 5(9)$$

$$= 27 + 45$$

$$= \boxed{72}$$

5) $h(a) = a^3 - 3a^2 - 2a$; Find $h(6)$

$$= 6^3 - 3(6)^2 - 2(6)$$

$$= 216 - 3(36) - 12$$

$$= 216 - 108 - 12$$

$$= \boxed{96}$$

6) $g(n) = n + 3$; Find $g(n - 4)$

$$= (n - 4) + 3$$

$$= \boxed{n + -1} \quad \text{or} \quad \boxed{n - 1}$$

7) $h(x) = -3x - 1$; Find $h(x + 1)$

$$= -3(\overbrace{x+1}) - 1$$

$$= -3x + -3 - 1$$

$$= \boxed{-3x - 4}$$

8) $h(x) = x + 5$; Find $h(x - 1)$

$$= (x - 1) + 5$$

$$= \boxed{x + 4}$$

9) $g(x) = x - 3$; Find $g\left(\frac{x}{3}\right)$

$$= \boxed{\frac{x}{3} - 3}$$

10) $f(x) = 4x - 3$; Find $f(-4x)$

$$= 4(-4x) - 3$$

$$= \boxed{-16x - 3}$$

Perform the indicated operation.

$$11) \begin{aligned} g(a) &= -3a^2 + 4 = -3(8)^2 + 4 = -188 \\ h(a) &= 4a - 2 = 4(8) - 2 = 30 \\ \text{Find } g(8) \div h(8) \end{aligned}$$

$$\frac{-188}{30} = \boxed{-6.2\overline{6}}$$

$$13) \begin{aligned} g(x) &= x - 2 = -3 - 2 = -5 \\ h(x) &= -2x + 5 = -2(-3) + 5 = 11 \\ \text{Find } g(-3) + h(-3) \end{aligned}$$

$$-5 + 11 = \boxed{+6}$$

$$15) \begin{aligned} f(n) &= n^3 + n^2 = 8^3 + 8^2 = 576 \\ g(n) &= 2n - 4 = 2(8) - 4 = 12 \\ \text{Find } \left(\frac{f}{g}\right)(8) \end{aligned}$$

$$\frac{576}{12} = \boxed{48}$$

$$17) \begin{aligned} g(x) &= -4x - 5 = -4(x-2) - 5 = -4x + 3 \\ f(x) &= 4x + 1 = 4(x-2) + 1 = 4x - 7 \\ \text{Find } g(x-2) - f(x-2) \end{aligned}$$

$$\begin{aligned} (-4x+3) - (4x-7) \\ -4x+3-4x+7 \\ \hline -8x+10 \end{aligned}$$

$$19) \begin{aligned} f(t) &= 2t = 2(2t) = 4t \\ g(t) &= 4t - 5 = 4(2t) - 5 = 8t - 5 \\ \text{Find } f(2t) - g(2t) \end{aligned}$$

$$\begin{aligned} 4t - (8t-5) \\ 4t - 8t + 5 \\ \hline -4t + 5 \end{aligned}$$

$$12) \begin{aligned} g(x) &= 4x - 4 = 4(-1) - 4 = -8 \\ h(x) &= x - 1 = -1 - 1 = -2 \\ \text{Find } (g-h)(-1) \end{aligned}$$

$$-8 - -2 = \boxed{-6}$$

$$14) \begin{aligned} f(x) &= 2x = 2(10) = 20 \\ g(x) &= x + 3 = 10 + 3 = 13 \\ \text{Find } f(10) \div g(10) \end{aligned}$$

$$\frac{20}{13}$$

$$16) \begin{aligned} h(n) &= n^2 + 4 = (-n)^2 + 4 = n^2 + 4 \\ g(n) &= -4n + 1 = -4(-n) + 1 = 4n + 1 \\ \text{Find } (h \cdot g)(-n) \end{aligned}$$

$$\begin{aligned} (n^2+4)(4n+1) \\ 4n^3 + n^2 + 16n + 4 \end{aligned}$$

$$18) \begin{aligned} g(t) &= 2t^2 + 3 = 2(n^2)^2 + 3 = 2n^4 + 3 \\ h(t) &= t - 5 \quad \cancel{2n^2-5} \\ \text{Find } (g+h)(n^2) \end{aligned}$$

$$\begin{aligned} (2n^4+3) + (n^2-5) \\ 2n^4 + 3 + n^2 - 5 \\ \hline 2n^4 + n^2 - 2 \end{aligned}$$

$$20) \begin{aligned} g(x) &= 2x - 3 = 2(n^2) - 3 = 2n^2 - 3 \\ f(x) &= x - 2 \quad \cancel{n^2-2} \\ \text{Find } g(n^2) \div f(n^2) \end{aligned}$$

$$\frac{2n^2-3}{n^2-2}$$