

## Evaluate Functions

Evaluate each function.

1)  $k(x) = x^3 + 4x^2 + 2x$ ; Find  $k(2)$

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

$$= 8 + 16 + 4$$

$$\boxed{k(2) = 28}$$

2)  $g(t) = t^3 + 5t^2$ ; Find  $g(-8)$

$$(-8)^3 + 5(-8)^2$$

$$= -512 + 320$$

$$\boxed{g(-8) = -192}$$

3)  $g(x) = -x + 4$ ; Find  $g(-9)$

$$-(-9) + 4$$

$$= 9 + 4$$

$$\boxed{g(-9) = 13}$$

4)  $k(a) = -2a - 4$ ; Find  $k(1)$

$$-2(1) - 4$$

$$= -2 - 4$$

$$\boxed{k(1) = -6}$$

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

$$(4)^2 - 4$$

$$= 16 - 4$$

$$\boxed{f(4) = 12}$$

6)  $p(a) = a + 2$ ; Find  $p(-9)$

$$-9 + 2$$

$$\boxed{p(-9) = -7}$$

7)  $k(n) = n^3 + 2$ ; Find  $k(0)$

$$0^3 + 2$$

$$\boxed{k(0) = 2}$$

8)  $h(n) = 3n - 4$ ; Find  $h(8)$

$$3(8) - 4$$

$$= 24 - 4$$

$$\boxed{h(8) = 20}$$

9)  $f(t) = 4t - 1$ ; Find  $f(3t)$

$$4(3t) - 1$$

$$= 12t - 1$$

$$\boxed{f(3t) = 12t - 1}$$

10)  $f(a) = a + 1$ ; Find  $f(-3a)$

$$(-3a) + 1$$

$$\boxed{f(-3a) = -3a + 1}$$

11)  $h(n) = -4n + 3$ ; Find  $h(-n)$

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

$$\boxed{h(-n) = 4n + 3}$$

12)  $g(n) = 2n^3 - n$ ; Find  $g(a-2)$

$$2(a-2)^3 - (a-2)$$

$$= 2(a-2)(a-2)(a-2) - (a-2)$$

$$= (2a-4)(a-2)(a-2) - a + 2$$

$$= (2a^2 - 4a - 4a + 8)(a-2) - a + 2$$

$$= (2a^2 - 8a + 8)(a-2) - a + 2$$

$$= 2a^3 - 4a^2 - 8a^2 + 16a + 8a - 16 - a + 2$$

$$\boxed{g(a-2) = 2a^3 - 12a^2 + 23a - 14}$$

13)  $f(a) = a^3 + 3a^2$ ; Find  $f(3+a)$

$$(3+a)(3+a)(3+a) + 3(3+a)^2$$

$$= (9 + 3a + 3a + a^2)(3+a) + 3(9 + 3a + 3a + a^2)$$

$$= (9 + 6a + a^2)(3+a) + 3(9 + 6a + a^2)$$

$$= 27 + 9a + 18a + 6a^2 + 3a^2 + 27 + 18a + 3a^2$$

$$= 54 + 45a + 9a^2$$

$$\boxed{f(3+a) = a^3 + 12a^2 + 45a + 54}$$

14)  $h(x) = -2x - 2$ ; Find  $h(x-3)$

$$-2(x-3) - 2$$

$$= -2x + 6 - 2$$

$$\boxed{h(x-3) = -2x + 4}$$

15)  $h(n) = 3n - 4$ ; Find  $h(2+n)$

$$3(2+n) - 4$$

$$= 6 + 3n - 4$$

$$\boxed{h(2+n) = 3n + 2}$$

16)  $f(n) = 2n - 1$ ; Find  $f(-3+n)$

$$2(-3+n) - 1$$

$$= -6 + 2n - 1$$

$$\boxed{f(-3+n) = 2n - 7}$$

Graph the parent function and each given function in your calculator. Then, compare the two functions.

1.  $f(x) = 2x + 2$

- Vertical Stretch with a factor of 2
- Shifts up 2 units

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

- Vertical Shrink with a factor of  $\frac{2}{3}$
- Reflection across y-axis.
- Shifts down 1 unit.

3.  $g(x) = -4x - 7$

- Reflection across y-axis
- Vertical Stretch with a factor of 4
- Shifts down 7 units

4.  $h(x) = \frac{7}{3}x + 6$

- Vertical Stretch with a factor of  $\frac{7}{3}$
- Shifts up 6 units

5.  $f(x) = 7x - 5$

- Vertical Stretch with a factor of 7
- Shifts down 5 units

6.  $m(x) = -x$

- Reflection across y-axis.