1. a. $x^6 x^{14} = x^{6+14} = x^{20}$

   b. $b^{17} b^8 = b^{17+8} = b^{25}$

   c. $w^2 w^9 = w^{2+9} = w^{11}$

   d. $y y^{28} = y^1 y^{28} = y^{1+28} = y^{29}$

   e. $x x = x^1 x^1 = x^{1+1} = x^2$

   f. $x^{16} x^{-6} = x^{16+(-6)} = x^{10}$

2. a. $\left(t^4\right)^6 = t^{4 \cdot 6} = t^{24}$

   b. $\left(m^8\right)^3 = m^{8 \cdot 3} = m^{24}$

   c. $\left(2^2\right)^3 = 2^{2 \cdot 3} = 2^6 = 64$

   d. $\left(y^9\right)^1 = y^{9 \cdot 1} = y^9$

   e. $\left(p^{-7}\right)^{-3} = p^{(-7)(-3)} = p^{21}$

   f. $\left(x^{1/2}\right)^2 = x^{(1/2)(2)} = x^1 = x$

3. a. $\left(t^4\right)^2 = t^{4 \cdot 2} = t^8$

   b. $u^4 u^2 = u^{4+2} = u^6$

   c. $j^5 j^{10} = j^{5+10} = j^{15}$

   d. $k^{19} k = k^{19} k^1 = k^{19+1} = k^{20}$

   e. $\left(r^1\right)^{17} = r^{1 \cdot 17} = r^{17}$

   f. $v^{1/2} v^{1/2} = v^{1/2+1/2} = v^1 = v$

4. a. $(3+4)^2 = 7^2 = 49$ $\quad 3^2 + 4^2 = 9 + 16 = 25$ $\quad (3+4)^2 \neq 3^2 + 4^2$

   b. $(3 \cdot 4)^2 = 12^2 = 144$ $\quad 3^2 \cdot 4^2 = 9 \cdot 16 = 144$ $\quad (3 \cdot 4)^2 = 3^2 \cdot 4^2$

   c. $(1 \cdot 5)^3 = 5^3 = 125$ $\quad 1^3 \cdot 5^3 = 1 \cdot 125 = 125$ $\quad (1 \cdot 5)^3 = 1^3 \cdot 5^3$

   d. $(1+5)^3 = 6^3 = 216$ $\quad 1^3 + 5^3 = 1 + 125 = 126$ $\quad (1+5)^3 \neq 1^3 + 5^3$

5. The true statement is (b): Exponents distribute over multiplication (but not addition).

6. a. $(2y)^4 = 2^4 y^4$
$= 16y^4$

b. $(x^2 x^5)^3 = (x^7)^3$
$= x^{21}$

c. $(-2x^4)(2x^4 y^2) = (-2 \cdot 2)(x^4 x^4)(y^2)$
$= -4x^8 y^2$

d. $(3x)(2x^4)^3 = (3x)(2^3 (x^4)^3)$
$= (3x)(8x^{12})$
$= (3 \cdot 8)(x x^{12})$
$= 24x^{13}$

e. $(-2bc^3)^4 = (-2)^4 b^4 (c^3)^4$
$= 16b^4 c^{12}$

f. $(-k^8)^6 = (-1 \cdot k^8)^6$
$= (-1)^8 (k^8)^6$
$= (1)k^{48}$
$= k^{48}$

g. $3x^5 + x^5 = (3+1)x^5$
$= 4x^5$

h. $(3x^5)(x^5) = 3(x^5 x^5)$
$= 3x^{10}$

7. For Figure 1

a. $f(0) = -6$ and $f(2) = -4$ b. $f(x) = 2$ if the value of x is -4 or 4.

c. The domain of f is $(-\infty, \infty)$ and the range of f is ~~$[6, \infty)$~~ $[-6, \infty)$.

For Figure 2

a. $f(0) = 1$ and $f(2) = 3$ b. $f(x) = 2$ if the value of x is 1.

c. The domain of f is $(-\infty, 4]$ and the range of f is $(-\infty, 5]$.

For Figure 3

a. $f(0) = 4$ and $f(2)$ does not exist b. $f(x) = 2$ if the value of x is -2.

c. The domain of f is $[-2, 2)$ and the range of f is $[2, 4]$.

For Figure 4

a. $f(0) = 1$ and $f(2) = 0$ b. $f(x)$ never equals 2.

c. The domain of f is $(-\infty, 4)$ and the range of f is $(-\infty, 1]$.