

Chapter 4 Prerequisite Skills**Apply the Exponential Laws**

1. Write each expression as a single power, and then evaluate.

a) $5^3 \times 5^2$ b) $(-4)^4 \times (-4)^3$
 c) $\left(\frac{1}{2}\right)^2 \times \left(\frac{1}{2}\right)^5$ d) $\left(-\frac{1}{3}\right)^3 \times \left(-\frac{1}{3}\right)^2$

2. Write each expression as a single power, and then evaluate.

a) $8^5 \div 8^3$ b) $2^9 \div 2^4$
 c) $\left(\frac{1}{4}\right)^7 \div \left(\frac{1}{4}\right)^3$ d) $\left(-\frac{1}{2}\right)^{12} \div \left(-\frac{1}{2}\right)^6$

3. Write as a single power, and then evaluate.

a) $(5^3)^2$ b) $(2^2)^4$
 c) $[(-3)^3]^2$ d) $\left[\left(\frac{1}{2}\right)^3\right]^3$

Zero and Negative Exponents

4. Evaluate. Express your answers as fractions or integers.

a) 4^0 b) 3^{-1} c) 6^{-2}
 d) 2^{-5} e) $(-5)^{-3}$ f) $-\left(\frac{3}{4}\right)^0$

5. Simplify. Write your answers using only positive exponents.

a) $(x^2)(x^7)$ b) $a^8 \times a^{-5}$ c) $b^7 \div b^{-4}$
 d) $(t^6)^{-2}$ e) $\frac{k^{-8}}{k^{-3}}$ f) $\frac{(n^{12})^0}{n^{-9}}$

Solve Linear Equations

6. Solve for x .

a) $3x + 7 = 2x - 4$
 b) $4(x - 2) = x - 2(x - 1)$

Work With Formulas

7. Rearrange the formula to isolate the indicated variable.

a) $V = \pi r^2 h$; solve for r
 b) $y = mx + b$; solve for m
 c) $A = \frac{(a+b)h}{2}$; solve for a

8. Substitute the indicated values. Determine the value of the remaining variable.

a) $A = P(1 + r)^t$; $A = \$5000$, $r = 0.04$,
 $t = 3$ years
 b) $V = \frac{1}{3}\pi r^2 h$; $V = 2000 \text{ cm}^3$, $h = 30 \text{ cm}$
 c) $T_c = \frac{5(T_F - 32)}{9}$; $T_c = 28 \text{ }^\circ\text{C}$

Linear and Quadratic Relations

9. Graph each linear relation. Label the y -intercept.

a) $y = -3x + 5$ b) $y = \frac{1}{4}x - 3$
 c) $2x + 3y = 9$ d) $y = 4$

10. Graph each quadratic relation. Label the vertex.

a) $y = x^2 - 5$ b) $y = 3 - x^2$
 c) $y = (x + 2)^2 - 7$ d) $y = -2(x - 4)^2 + 1$

11. Use finite differences to determine whether each relation is linear, quadratic, or neither.

a)

x	y
-2	14
-1	9
0	6
1	5
2	6

b)

x	y
-2	0
-1	-15
0	-16
1	-9
2	0

