1.7 Chapter Review

Section 1.1

1. Evaluate.

   a) $|-3|-|-2|$ _____   b) $-|-3-(-4)|$ _____

   c) $-|2|-|-2|$ _____   d) $|-4|+(-4)$ _____

Section 1.2

2. Solve for x.

   a) $x^2 = 16$ _____   b) $x^3 = 27$ _____

   c) $x^2 = -16$ _____   d) $x^3 = -27$ _____

   e) $x^6 = 3$ _____   f) $x^5 = 3$ _____

   g) $x^6 = -3$ _____   h) $x^5 = -3$ _____

3. Simplify. State the restrictions, if any, on the variable.

   a) $\sqrt{9x^7}$ _____   b) $\sqrt{9x^6}$ _____

   c) $\sqrt[3]{-x^9}$ _____   d) $\sqrt[3]{(3-x)^6}$ _____

   e) $\sqrt[4]{x^7y^8}$ _____   f) $\sqrt[4]{(x+1)^5}$ _____

Section 1.3

4. Simplify. All variables represent non-negative real numbers.

   a) $\sqrt{75}$ _____   b) $\sqrt[3]{40}$ _____

   c) $-\frac{3}{4}\sqrt{80}$ _____   d) $\sqrt[3]{-250}$ _____

   e) $\sqrt[4]{81x^6y^7}$ _____   f) $\sqrt[3]{-16x^3y^4}$ _____

5. Write as an entire radical. All variables represent non-negative real numbers.

a) $3\sqrt{5}$

b) $3\sqrt[3]{5}$

c) $3\sqrt[4]{5}$

d) $3\sqrt[5]{5}$

e) $-2xy^2\sqrt{x^2y^3}$

f) $-2xy^2\sqrt[3]{x^2y^4}$

Section 1.4

6. Simplify. All variables represent positive numbers.

a) $\sqrt{28} + \sqrt{175}$

b) $\sqrt{32} - \sqrt{98}$

c) $5\sqrt{8x} - 3\sqrt{18x}$

d) $x\sqrt{18} + 4x\sqrt{8} - 5x\sqrt{3}$

e) $3x\sqrt{20x} - \sqrt{24x} + \sqrt{45x^3}$

f) $\dfrac{\sqrt{28}}{2x} + \sqrt{\dfrac{112}{x^2}}$

g) $\sqrt[3]{40} + 4\sqrt[3]{625}$

h) $3\sqrt[3]{16} - \sqrt[3]{54}$

i) $\sqrt[3]{24x} + \sqrt[3]{3x} - \sqrt[3]{375x}$

j) $\sqrt[3]{x^7} - 2x\sqrt[3]{x^4} + 3x^2\sqrt[3]{x}$

Section 1.5

7. Perform the indicated operation and simplify. All variables represent positive numbers.

a) $3\sqrt{2}(5\sqrt{7} - 4\sqrt{3})$

b) $3\sqrt[3]{2}(2\sqrt[3]{4} - 4\sqrt[3]{2})$

c) $(2 - \sqrt{3})(2 + \sqrt{3})$

d) $(2 - \sqrt{3})^2$

e) $(\sqrt[3]{9} - 1)(\sqrt[3]{3} + 1)$

f) $(\sqrt{x} + 2\sqrt{5})(\sqrt{x} - 2\sqrt{5})$

g) $(\sqrt{x} + 2\sqrt{5})^2$

h) $(\sqrt[3]{x^2} - 1)(\sqrt[3]{x^4} + \sqrt[3]{x^2} + 1)$

i) $\sqrt{x} \cdot \sqrt[3]{x} \cdot \sqrt[4]{x}$

j) $\dfrac{\sqrt{x^5}}{\sqrt[3]{x^2}}$

8. Rationalize the denominator.

a) $\dfrac{1}{\sqrt{5}}$

b) $\dfrac{1}{\sqrt[3]{5}}$

c) $\dfrac{1}{2 - \sqrt{3}}$

d) $\dfrac{\sqrt{x} + y}{\sqrt{x} - y}$

e) $\dfrac{\sqrt{x} - \sqrt{2y}}{\sqrt{x} + \sqrt{2y}}$

f) $\dfrac{\sqrt{2}\,x - y}{\sqrt{2}\,x + y}$

Section 1.6

9. Solve the radical equation.

a) $\sqrt{x + 1} = x + 1$

b) $\sqrt{x - 5} = \sqrt{x} - 1$

c) $\sqrt{x + 1} = \sqrt{x} + 1$

d) $\sqrt{x - 4} = 2 + \sqrt{x}$

e) $\sqrt{2x - 1} + \sqrt{x + 3} = 3$

f) $\sqrt{2x - 1} = \sqrt{x - 4} + 2$

g) $\sqrt{x + 4} + \sqrt{3x + 9} = \sqrt{x + 25}$

h) $\sqrt{x - 3} + \sqrt{2x + 1} = 2\sqrt{x}$