1.8.1)

(a) $\sqrt{121} = \boxed{11}$

(b) $\sqrt{35000} = \sqrt{36 \cdot 1000} = 6 \cdot \sqrt{100 \cdot 10} = \boxed{60\sqrt{10}}$

(c) $\sqrt{1323} = \sqrt{9 \times 49 \times 3} = 3 \times 7\sqrt{3} = \boxed{21\sqrt{3}}$

$1323 = 3 \times 49 \times 9$

(d) $\sqrt{6.76}$ $\qquad \dfrac{676}{100}$ $\qquad 676 = 169 \cdot 4 = 13^2 \cdot 2^2$

$$\begin{array}{l} 169 \\ 676\ \overline{|\ 4} \\ \underline{4} \\ 27 \\ \underline{24} \\ 36 \end{array}$$

$$\frac{\sqrt{13^2 \cdot 2^2}}{\sqrt{100}} = \frac{13 \cdot \cancel{2}}{\cancel{10}_{5}} = \frac{13}{5} = \boxed{2.6}$$

(e) $\left(\sqrt{2}\right)^8 = \left(2^{1/2}\right)^8 = \boxed{16}$

(f) $\left(-\sqrt{27}\right)^3 = \left((-1) \cdot \left(3^3\right)^{1/2}\right)^3$

$= -1 \times \left(3^{3/2}\right)^3 = -\left(\sqrt{3}\right)^9$

$= -\left(\sqrt{3}^8 \times \sqrt{3}^1\right)$

$= -\left(3^4 \times \sqrt{3}\right) = \boxed{-81\sqrt{3}}$

1.8.2)

(a) $\sqrt[3]{80} = \sqrt[3]{10 \cdot 8} = \boxed{2\sqrt[3]{10}}$

(b) $\sqrt[4]{81} = \sqrt[4]{3^4} = \boxed{3}$

(c) $\sqrt[4]{\dfrac{32}{625}}$ $\qquad 32 = 2^4 \cdot 2^1$

$625 = 5^4$

$\sqrt{625}$

$$\sqrt[4]{\frac{2^4\cdot 2}{5^4}} = \frac{2}{5}\sqrt[4]{2}$$

(d)

$$\sqrt[3]{-0.001} \qquad 0.001 = 1\times 10^{-3}$$

$$\sqrt[3]{-\frac{1}{10^3}} = \frac{1}{10}\cdot -1 = -\frac{1}{10} = -0.1$$

(e)

$$\left(\sqrt[3]{7}\right)^9 = \left(7^{1/3}\right)^3\cdot\left(7^{1/3}\right)^6$$

$$= 7\cdot 7^2 = 49\times 7 = 343$$

$$\begin{array}{r} {}^{6}\\ 49\\ \times\ 7\\ \hline 343 \end{array}$$

(f) $\sqrt[4]{2^{4/3}} = \left(2^{4/3}\right)^{1/4} = 2^{1/3} = \sqrt[3]{2}$

1.8.3) $\sqrt[3]{n}$ solo se puede simplificar si en la factorización prima de n hay primos a la tercera potencia o mayor.

1.8.4)

(a) $\sqrt{28} + \sqrt{63} - \sqrt{175}$

$$2\sqrt{7} + 3\sqrt{7} - 5\sqrt{7} = 0$$

(b) $\sqrt{135} - 3\sqrt{1500} + \sqrt{960} =$

$$3\sqrt{15} - 30\sqrt{15} + 8\sqrt{15} = -19\sqrt{15}$$

(c) $\sqrt[3]{375} - \sqrt[3]{192}$

$$\begin{array}{r|l} 192 & 3 \\ \hline 18 & 64 \\ \hline 12 & \end{array}$$

$375 = 3\times 5^3$

$192 = 64 \times 3$

$$\sqrt[3]{3\times 5^3} - \sqrt[3]{4^3\times 3} = 5\sqrt[3]{3} - 4\sqrt[3]{3}$$

$$= \sqrt[3]{3}$$

(d)

$$\sqrt[3]{\frac{256}{27}} + \sqrt[3]{32} - \sqrt[3]{\frac{12}{81}}$$

$$\frac{4}{3}\sqrt[3]{4} + \frac{6}{3}\sqrt[3]{4} - \frac{1}{3}\sqrt[3]{4}$$

$$3\sqrt[3]{4}$$

$256 = 4 \times 4^3$

$= 4^3 \times 4^1$

$32 = 2^3 \cdot 2^2$

$27 = 3^3$

$12 = 4 \cdot 3$

$81 = 3^4$

$$\frac{12}{81} = \frac{4}{3^3}$$

1.8.5)

(a) $\sqrt{3} \times \sqrt[3]{3} = 3^{1/2} \times 3^{1/3} = 3^{5/6}$ $x = 5/6$

(b) $\sqrt{8} \times \sqrt[5]{4} = (2^3)^{1/2} \times (2^2)^{1/5} = 2^{3/2} \times 2^{2/5} = 2^{19/10}$ $x = 19/10$

$$\frac{3}{2} + \frac{2}{5} = \frac{15+4}{10} = \frac{19}{10}$$

1.8.6)

$$\frac{\sqrt{600} - \sqrt{150} + 3\sqrt{54}}{6\sqrt{32} - 2\sqrt{50} - \sqrt{288}} = \frac{10\sqrt{6} - 5\sqrt{6} + 9\sqrt{6}}{24\sqrt{2} - 10\sqrt{2} - 12\sqrt{2}} = \frac{14\sqrt{6}}{2\sqrt{2}}$$

$a = 7$ y $b = 3$

$$= \frac{7\,\sqrt{2}\cdot\sqrt{3}}{\sqrt{2}} = 7\sqrt{3}$$

* 1.8.7)

$$\frac{-\sqrt{20} + 2\sqrt{245}}{\sqrt{270} - \sqrt{120}} = \frac{-2\sqrt{5} + 14\sqrt{5}}{3\sqrt{30} - 2\sqrt{30}} = \frac{12\sqrt{5}}{\sqrt{30}} = \frac{2\sqrt{30}\cdot\sqrt{6}}{\sqrt{30}}$$

$$= 2\sqrt{6}$$

$20 = 5 \cdot 4$

$245 = 7^2 \cdot 5$

$12\sqrt{5} = \sqrt{144 \cdot 5}$

$270 = 5 \cdot 2 \cdot 3^2 \cdot 3$

$120 = 5 \cdot 2 \cdot 4 \cdot 3$

$= \sqrt{4 \cdot 3 \cdot 4 \cdot 3 \cdot 5}$

$= 2\sqrt{180}$