1.- a) $2^{-3} = \frac{1}{2^3} = \frac{1}{8}$ b) $(-2)^5 = -32$ c) $\left(\frac{1}{3}\right)^4 = \frac{1}{3^4} = \frac{1}{81}$

d) $\left(\frac{4}{5}\right)^{-2} = \left(\frac{5}{4}\right)^2 = \frac{25}{16}$ e) $\left(-\frac{3}{2}\right)^{-3} = \left(-\frac{2}{3}\right)^3 = -\frac{8}{27}$ f) $-1^{14} = -1$

g) $(-1)^{143} = -1$ h) $\left(\frac{1}{3}\right)^{-2} = 3^2 = 9$ i) $(-2)^{-2} = \left(\frac{1}{2}\right)^2 = \frac{1}{4}$

j) $-2^2 = -4$ k) $(-4)^3 = -64$ l) $\left(-\frac{1}{4}\right)^{-2} = (-4)^2 = 16$

2.- a) $3^4 \cdot 3^{-5} \cdot 3^{-4} = 3^{-5} = \frac{1}{3^5}$ b) $2^5 \cdot 3^5 = 6^5$ c) $\left(4^2\right)^{-3} = 4^{-6} = \frac{1}{4^6}$

d) $\left(\frac{1}{3}\right)^{-3} \cdot 3^2 \cdot \left(\frac{1}{3}\right)^{-5} = 3^3 \cdot 3^{-2} \cdot 3^5 = 3^6$ e) $\left[\left(-\frac{2}{5}\right)^2\right]^{-3} = \left(-\frac{2}{5}\right)^{-6} = \left(-\frac{5}{2}\right)^6 = \left(\frac{5}{2}\right)^6$

f) $3^4 : 3^{-2} = 3^6$ g) $\left(\frac{1}{4}\right)^4 \cdot 4^{-3} : \left(\frac{1}{4}\right)^{-2} = 4^{-4} \cdot 4^{-3} : 4^2 = 4^{-9} = \frac{1}{4^9}$

h) $-3^2 \cdot 3^4 \cdot \left(\frac{1}{3}\right)^5 = -3^2 \cdot 3^4 \cdot 3^{-5} = -3$

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

d) $\sqrt[6]{a^5} = a^{\frac{5}{6}}$ e) $\sqrt{2a} = (2a)^{\frac{1}{2}}$ f) $\sqrt[7]{3^4 a^5} = \left(3^4 a^5\right)^{\frac{1}{7}}$

g) $\sqrt[12]{a^7 b^5} = \left(a^7 b^5\right)^{\frac{1}{12}}$ h) $\sqrt[4]{a^7 b^3} = \left(a^7 b^3\right)^{\frac{1}{4}}$

4.- a) $\sqrt{8a^5} = \sqrt{2^3 a^5} = 2a^2\sqrt{2a}$ b) $\sqrt{49a^3} = \sqrt{7^2 a^3} = 7a\sqrt{a}$

c) $\sqrt[4]{16a^5b^4} = \sqrt[4]{2^4 a^5 b^4} = 2ab\sqrt[4]{a}$ d) $\sqrt[6]{64a^5b^{12}} = \sqrt[6]{2^6 a^5 b^{12}} = 2b^2\sqrt[6]{a^5}$

e) $\sqrt[3]{81a^4b^5c^6} = \sqrt[3]{3^4 a^4 b^5 c^6} = 3abc^2\sqrt[3]{3ab^2}$ f) $\sqrt{\frac{4a^3b}{3c^4}} = \frac{2a}{c^2}\sqrt{\frac{ab}{3}}$

5.- a) $2^{\frac{1}{3}} = \sqrt[3]{2}$ b) $\left(3a^2b\right)^{\frac{1}{3}} = \sqrt[3]{3a^2b}$

c) $\left(2a^3b^4\right)^{\frac{3}{7}} = \sqrt[7]{\left(2a^3b^4\right)^3} = \sqrt[7]{8a^9b^{12}}$

d) $\left(7a^2b\right)^{\frac{2}{5}} = \sqrt[5]{\left(7a^2b\right)^2} = \sqrt[5]{49a^4b^2}$

e) $\left(5x^2y^5\right)^{\frac{4}{5}} = \sqrt[5]{\left(5x^2y^5\right)^4} = \sqrt[5]{5^4x^8y^{20}}$ f) $\left(2a^2b^5\right)^{\frac{1}{4}} = \sqrt[4]{2a^2b^5}$

6.-

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

b) $4\sqrt[3]{2}-7\sqrt[6]{2^2}+2\sqrt[3]{2}=4\sqrt[3]{2}-7\sqrt[3]{2}+2\sqrt[3]{2}=(4-7+2)\sqrt[3]{2}=-\sqrt[3]{2}$

c) $\frac{1}{2}\sqrt[3]{3}+\frac{3}{5}\sqrt[3]{3}-\frac{5}{4}\sqrt[3]{3}=\left(\frac{1}{2}+\frac{3}{5}-\frac{5}{4}\right)\sqrt[3]{3}=-\frac{3}{20}\sqrt[3]{3}$

d) $2\sqrt{\frac{1}{2}}+\frac{1}{2}\sqrt{\frac{1}{2}}-4\sqrt{\frac{1}{2}}=\left(2+\frac{1}{2}-4\right)\sqrt{\frac{1}{2}}=-\frac{3}{2}\sqrt{\frac{1}{2}}=-\frac{3}{2}\cdot\frac{1}{\sqrt{2}}=-\frac{3\sqrt{2}}{2\cdot 2}=-\frac{3\sqrt{2}}{4}$

e) $3\sqrt{8}+2\sqrt{50}-4\sqrt{98}=3\sqrt{2^3}+2\sqrt{2\cdot 5^2}-4\sqrt{2\cdot 7^2}=3\cdot 2\sqrt{2}+2\cdot 5\sqrt{2}-4\cdot 7\sqrt{2}=$
$=6\sqrt{2}+10\sqrt{2}-28\sqrt{2}=(6+10-28)\sqrt{2}=-12\sqrt{2}$

f) $\frac{1}{2}\sqrt{3}+\frac{3}{2}\sqrt{12}-5\sqrt{75}=\frac{1}{2}\sqrt{3}+\frac{3}{2}\sqrt{2^2\cdot 3}-5\sqrt{5^2\cdot 3}=\frac{1}{2}\sqrt{3}+3\sqrt{3}-25\sqrt{3}=$
$=\left(\frac{1}{2}+3-25\right)\sqrt{3}=-\frac{43}{2}\sqrt{3}$

g) $\sqrt{2}\cdot\sqrt{5}\cdot\sqrt{3}=\sqrt{2\cdot 5\cdot 3}=\sqrt{30}$ h) $3\sqrt[3]{5}\cdot\sqrt[3]{2}\cdot\sqrt[3]{7}=3\sqrt[3]{5\cdot 2\cdot 7}=3\sqrt[3]{70}$

i) $4\sqrt{2a}\cdot 5\sqrt{3a}=20\sqrt{6a^2}=20a\sqrt{6}$

j) $2\sqrt[4]{3a}\cdot\sqrt{5a}=2\sqrt[4]{3a}\cdot\sqrt[4]{5^2a^2}=2\sqrt[4]{3\cdot 5^2a^3}=2\sqrt[4]{75a^3}$

k) $\sqrt[3]{4a^2}\cdot\sqrt[6]{2a^5}\cdot\sqrt{2a}=\sqrt[6]{2^4a^2}\cdot\sqrt[6]{2a^5}\cdot\sqrt[6]{2^3a^3}=\sqrt[6]{2^8a^{12}}=2a^2\sqrt[6]{2^2}=2a^2\sqrt[3]{2}$

l) $3\sqrt{5a}:2\sqrt[4]{4a^3}=\frac{3}{2}\sqrt[4]{\frac{5^2a^2}{2^2a^3}}=\frac{3}{2}\sqrt[4]{\frac{25}{4a}}$

m) $2\sqrt[4]{3a^3}:5\sqrt{3a}=\frac{2}{5}\sqrt[4]{\frac{3a^3}{3^2a^2}}=\frac{2}{5}\sqrt[4]{\frac{a}{3}}$

n) $\sqrt[6]{18a^2b^2c}:2\sqrt[6]{3a^5b}=\frac{1}{2}\sqrt[6]{\frac{18a^2b^2c}{3a^5b}}=\frac{1}{2}\sqrt[6]{\frac{6bc}{a^3}}$