

96	a) $\sqrt[4]{81} = \pm 3$ c) $\sqrt[4]{-100.000} = -10$ b) $\sqrt[4]{-27} = -3$ d) $\sqrt[4]{-216} = -6$	e) $\sqrt[4]{625} = \pm 5$ f) $\sqrt[4]{-128} = -2$
97	$\sqrt[4]{2^8} = 2^{\frac{8}{4}} = 2^2 = \sqrt[4]{2^8}$ $\sqrt[4]{3^8} = 3^{\frac{8}{4}} = 3^2 = \sqrt[4]{3^8}$	$\sqrt[4]{2^6} = 2^{\frac{6}{4}} = 2^{\frac{3}{2}} = 2^{\frac{15}{10}} = \sqrt[4]{2^{15}}$ $\sqrt[4]{7^2} = 7^{\frac{2}{4}} = 7^{\frac{8}{12}} = \sqrt[4]{7^8}$
98	a) $\sqrt[4]{16} = \sqrt[4]{2^4} = 2^{\frac{4}{4}} = 2 \cdot 2^{\frac{1}{3}} = 2\sqrt[3]{2}$ b) $\sqrt[4]{54} = \sqrt[4]{3^3 \cdot 2} = 3^{\frac{3}{4}} \cdot 2^{\frac{1}{4}} = 3 \cdot 2^{\frac{1}{4}} = 3\sqrt[4]{2}$ c) $\sqrt[4]{32} = \sqrt[4]{2^5} = 2^{\frac{5}{4}} = 2 \cdot 2^{\frac{1}{4}} = 2\sqrt[4]{2}$ d) $\sqrt{27} = \sqrt{3^3} = 3^{\frac{3}{2}} = 3 \cdot 3^{\frac{1}{2}} = 3\sqrt{3}$	e) $\sqrt{75} = \sqrt{3 \cdot 5^2} = 3^{\frac{1}{2}} \cdot 5 = 5\sqrt{3}$ f) $\sqrt[4]{128} = \sqrt[4]{2^7} = 2^{\frac{7}{4}} = 2 \cdot 2^{\frac{3}{4}} = 2\sqrt[4]{2^3}$ g) $\sqrt[4]{27} = \sqrt[4]{3^3} = 3^{\frac{3}{4}} = 3^{\frac{1}{2}} = \sqrt{3}$ h) $\sqrt[4]{625} = \sqrt[4]{5^4} = 5^{\frac{4}{4}} = 5^1 = \sqrt{5}$
99	a) $\sqrt{a\sqrt{a}} = (a \cdot a^{\frac{1}{2}})^{\frac{1}{2}} = (a^{\frac{3}{2}})^{\frac{1}{2}} = a^{\frac{3}{4}}$ b) $\sqrt[4]{a\sqrt{a\sqrt{a}}} = (a(a \cdot a^{\frac{1}{2}})^{\frac{1}{2}})^{\frac{1}{4}} = (a(a^{\frac{3}{2}})^{\frac{1}{2}})^{\frac{1}{4}} = (a \cdot a^{\frac{3}{4}})^{\frac{1}{4}} = (a^{\frac{7}{4}})^{\frac{1}{4}} = a^{\frac{7}{16}}$ c) $\sqrt{\frac{a}{\sqrt{a}}} = \left(\frac{a}{a^{\frac{1}{2}}}\right)^{\frac{1}{2}} = (a^{\frac{1}{2}})^{\frac{1}{2}} = a^{\frac{1}{4}}$	f) $\frac{1}{\sqrt[4]{a}} = \frac{1}{a^{\frac{1}{4}}} = a^{-\frac{1}{4}}$ d) $\sqrt[4]{a^{-5}} = a^{-\frac{5}{4}}$ e) $\frac{1}{\sqrt{a}} = \frac{1}{a^{\frac{1}{2}}} = a^{-\frac{1}{2}}$ g) $(\sqrt{a})^3 = a^{\frac{3}{2}}$ h) $\sqrt[3]{\frac{1}{a}} = a^{-\frac{1}{3}}$
100	a) $\sqrt[4]{3\sqrt{5}} = (3 \cdot 5^{\frac{1}{2}})^{\frac{1}{4}} = 3^{\frac{1}{4}} \cdot 5^{\frac{1}{8}} = 3^{\frac{2}{8}} \cdot 5^{\frac{1}{8}} = \sqrt[8]{3^2 \cdot 5}$ b) $\sqrt{\frac{\sqrt{2}}{\sqrt[4]{2}}} = \left(\frac{2^{\frac{1}{2}}}{2^{\frac{1}{4}}}\right)^{\frac{1}{2}} = (2^{\frac{1}{4}})^{\frac{1}{2}} = 2^{\frac{1}{8}} = \sqrt[8]{2}$ c) $\sqrt{\sqrt{\sqrt{3}}} = \left(\left(3^{\frac{1}{2}}\right)^{\frac{1}{2}}\right)^{\frac{1}{2}} = 3^{\frac{1}{8}} = \sqrt[8]{3}$	d) $\sqrt{\frac{1}{\sqrt{2}}} = \left(\frac{1}{2^{\frac{1}{2}}}\right)^{\frac{1}{2}} = (2^{-\frac{1}{2}})^{\frac{1}{2}} = 2^{-\frac{1}{4}} = \frac{1}{\sqrt[4]{2}}$ e) $\sqrt[4]{\sqrt[4]{2}} = (2^{\frac{1}{4}})^{\frac{1}{4}} = 2^{\frac{1}{16}} = \sqrt[16]{2}$ f) $\frac{1}{\sqrt{\sqrt{5}}} = \frac{1}{(5^{\frac{1}{2}})^{\frac{1}{2}}} = \frac{1}{5^{\frac{1}{4}}} = 5^{-\frac{1}{4}} = \frac{1}{\sqrt[4]{5}}$
101	a) $\sqrt{8} = \sqrt{2^3} = 2\sqrt{2}$ b) $\sqrt{18} = \sqrt{2 \cdot 3^2} = 3\sqrt{2}$ c) $\sqrt{50} = \sqrt{2 \cdot 5^2} = 5\sqrt{2}$ d) $\sqrt{98} = \sqrt{2 \cdot 7^2} = 7\sqrt{2}$	e) $\sqrt{12} = \sqrt{3 \cdot 2^2} = 2\sqrt{3}$ f) $\sqrt{75} = \sqrt{3 \cdot 5^2} = 5\sqrt{3}$ g) $\sqrt[3]{1.000} = \sqrt[3]{2^3 \cdot 5^3} = 2 \cdot 5 = 10$ h) $\sqrt[3]{40} = \sqrt[3]{2^3 \cdot 5} = 2\sqrt[3]{5}$
102	a) $\sqrt[4]{8a^5} = \sqrt[4]{2^3 a^5} = 2a\sqrt[4]{a^2}$ b) $\sqrt[4]{16a^7} = \sqrt[4]{2^4 a^7} = 2a\sqrt[4]{a^3}$ c) $\sqrt{2^6 a^4 b^8} = 2^3 a^2 b^4$	d) $\sqrt[4]{a^6 b^5 c^9} = abc^2 \sqrt[4]{a^2 bc}$ e) $\sqrt[3]{a^6 b^{10}} = ab^2 \sqrt[3]{a}$ f) $\sqrt[3]{15.625 x^4 y^3} = \sqrt[3]{5^6 x^4 y^3} = 5^2 xy \sqrt[3]{x}$
103	a) $\sqrt[3]{\frac{a^{12}}{a^{18}}} = \sqrt[3]{\sqrt{a^{-6}}} = (a^{-\frac{6}{2}})^{\frac{1}{3}} = a^{-1} = \frac{1}{a}$ b) $\sqrt[4]{32a^5 b^{-8} c^{-12}} = \sqrt[4]{2^5 a^5 b^{-8} c^{-12}} = 2ab^{-2}c^{-3} \sqrt[4]{2a}$ c) $\sqrt[3]{\frac{8a^4}{81b^3}} = \sqrt[3]{\frac{2^3 a^4}{3^4 b^3}} = \frac{2a}{3b} \sqrt[3]{\frac{a}{3}}$	d) $\frac{-\sqrt[3]{8a^3 b^5 c^{-2}}}{\sqrt[3]{-32a^6 b^4}} = \frac{-\sqrt[3]{2^3 a^3 b^5 c^{-2}}}{-\sqrt[3]{2^5 a^6 b^4}} = \sqrt[3]{\frac{b}{2^2 a^3 c^2}} = \frac{1}{a} \sqrt[3]{\frac{b}{2^2 c^2}}$ e) $\sqrt[4]{729a^7 b^{-12}} = \sqrt[4]{3^6 a^7 b^{-12}} = 3ab^{-2} \sqrt[4]{a}$ f) $\left(\frac{1}{a^2}\right)^{-\frac{1}{2}} = (a^{-1})^{-\frac{1}{2}} = a^{\frac{1}{2}} = \sqrt{a}$

104	<p>a) $2\sqrt[3]{5} = \sqrt[3]{2^3 \cdot 5} = \sqrt[3]{40}$</p> <p>b) $4\sqrt[4]{20} = \sqrt[4]{4^4 \cdot 20} = \sqrt[4]{5.120}$</p> <p>c) $3\sqrt[5]{15} = \sqrt[5]{3^5 \cdot 15} = \sqrt[5]{3.645}$</p> <p>d) $\frac{3}{5}\sqrt{2} = \sqrt{\frac{3^2 \cdot 2}{5^2}} = \sqrt{\frac{18}{25}}$</p> <p>e) $\frac{1}{2}\sqrt[4]{6} = \sqrt[4]{\frac{1 \cdot 6}{2^4}} = \sqrt[4]{\frac{6}{16}} = \sqrt[4]{\frac{3}{8}}$</p>	<p>f) $\frac{1}{2}\sqrt[4]{\frac{1}{2}} = \sqrt[4]{\frac{1}{2^4 \cdot 2}} = \sqrt[4]{\frac{1}{32}}$</p> <p>g) $2\sqrt[3]{7} = \sqrt[3]{2^3 \cdot 7} = \sqrt[3]{56}$</p> <p>h) $5\sqrt[3]{\frac{1}{5}} = \sqrt[3]{\frac{5^3}{5}} = \sqrt[3]{5^2} = \sqrt[3]{25}$</p> <p>i) $\frac{3}{5}\sqrt[3]{\frac{2}{3}} = \sqrt[3]{\frac{3^3 \cdot 2}{5^3 \cdot 3}} = \sqrt[3]{\frac{18}{125}}$</p> <p>j) $\frac{1}{7} \cdot \frac{\sqrt[3]{3}}{4} = \sqrt[3]{\frac{3}{7^3 \cdot 4^3}} = \sqrt[3]{\frac{3}{21.952}}$</p>
105	<p>a) $a \cdot \sqrt{\frac{4a-1}{2a}} = \sqrt{\frac{a^2(4a-1)}{2a}} = \sqrt{\frac{4a^2-a}{2}}$</p> <p>b) $\frac{4ab}{c} \cdot \sqrt{\frac{c^2b}{8a}} = \sqrt{\frac{4^4 a^4 b^4 c^2 b}{c^4 8a}} = \sqrt{\frac{2^8 a^4 b^5 c^2}{2^3 a c^4}} = \sqrt{\frac{2^5 a^3 b^5}{c^2}}$</p> <p>c) $\frac{2}{a} \cdot \sqrt{\frac{3a}{8}} = \sqrt{\frac{2^2 3a}{2^3 a^2}} = \sqrt{\frac{3}{2a}}$</p>	<p>d) $-2ab^2 \sqrt[3]{ab} = \sqrt[3]{-2^3 a^3 b^6 ab} = \sqrt[3]{-2^3 a^4 b^7}$</p> <p>e) No es posible introducir factores, puesto que 5 no es factor.</p> <p>f) $-a^2 \sqrt[3]{a} = \sqrt[3]{-a^6 a} = \sqrt[3]{-a^7}$</p>
106	<p>a) $(3\sqrt{2}-5) \cdot (4\sqrt{2}-3) = 12(\sqrt{2})^2 - 9\sqrt{2} - 20\sqrt{2} + 15 = -29\sqrt{2} + 39$</p> <p>b) $(2\sqrt{7}+3\sqrt{2}) \cdot (5-2\sqrt{2}) = 10\sqrt{7} - 4\sqrt{14} + 15\sqrt{2} - 6(\sqrt{2})^2 = 10\sqrt{7} - 4\sqrt{14} + 15\sqrt{2} - 12$</p> <p>c) $(\sqrt{3}+\sqrt{2}) \cdot (\sqrt{3}-\sqrt{2}) = (\sqrt{3})^2 - \sqrt{6} + \sqrt{6} - (\sqrt{2})^2 = 3 - 2 = 1$</p> <p>d) $(5\sqrt{2}-3) \cdot (5\sqrt{2}+3) = 25(\sqrt{2})^2 + 15\sqrt{2} - 15\sqrt{2} - 9 = 50 - 9 = 41$</p>	<p>e) $(7\sqrt{5}+4) \cdot (5\sqrt{5}-3\sqrt{6}) = 35(\sqrt{5})^2 - 21\sqrt{30} + 20\sqrt{5} - 12\sqrt{6} = 175 - 21\sqrt{30} + 20\sqrt{5} - 12\sqrt{6}$</p> <p>f) $(7\sqrt{2}-3) \cdot (5\sqrt{3}+2) = 35\sqrt{6} + 14\sqrt{2} - 15\sqrt{3} - 6$</p> <p>g) $(6\sqrt{7}+\sqrt{5}) \cdot (6\sqrt{7}-\sqrt{5}) = 36(\sqrt{7})^2 - 6\sqrt{35} + 6\sqrt{35} - (\sqrt{5})^2 = 252 - 5 = 247$</p> <p>h) $(2\sqrt{5}-\sqrt{10}) \cdot (2\sqrt{5}+\sqrt{10}) = 4(\sqrt{5})^2 + 2\sqrt{50} - 2\sqrt{50} - (\sqrt{10})^2 = 20 - 10 = 10$</p>
107	<p>a) $\sqrt[4]{a^3} \cdot \sqrt[3]{a^5} \cdot \sqrt[5]{a^4} = a^{\frac{3}{4}} \cdot a^{\frac{5}{3}} \cdot a^{\frac{4}{5}} = a^{\frac{9}{12}} \cdot a^{\frac{20}{12}} \cdot a^{\frac{8}{12}} = a^{\frac{27}{12}} = \sqrt[4]{a^{27}} = a^{3\sqrt[4]{3}}$</p> <p>b) $\sqrt[3]{3a^2b} \cdot \sqrt{2ab^3} = (3a^2b)^{\frac{1}{3}} \cdot (2ab^3)^{\frac{1}{2}} = (3a^2b)^{\frac{2}{6}} \cdot (2ab^3)^{\frac{3}{6}} = \sqrt[6]{3^2 a^4 b^2 \cdot 2^3 a^3 b^9} = \sqrt[6]{2^3 3^2 a^7 b^{11}}$</p>	<p>c) $\sqrt[3]{2a^3b^4} \cdot \sqrt[4]{4ab^2} = (2a^3b^4)^{\frac{1}{3}} \cdot (4ab^2)^{\frac{1}{4}} = (2a^3b^4)^{\frac{3}{12}} \cdot (4ab^2)^{\frac{3}{12}} = \sqrt[12]{2^3 a^9 b^{12} \cdot 4^3 a^3 b^6} = \sqrt[12]{2^{10} a^{12} b^{18}} = \sqrt[4]{a^3 b^3} = \sqrt[4]{\frac{a^3 b^3}{2^7}}$</p> <p>d) $\sqrt[3]{ab} \cdot \sqrt{a\sqrt[3]{b}} = ((ab)^{\frac{1}{3}})^{\frac{1}{2}} \cdot (a(b)^{\frac{1}{3}})^{\frac{1}{2}} = a^{\frac{1}{6}} b^{\frac{1}{6}} a^{\frac{1}{2}} b^{\frac{1}{6}} = a^{\frac{2}{3}} b^{\frac{1}{3}} = \sqrt[3]{a^2 b}$</p>
108	<p>a) $(2+\sqrt{3})^2 - (2+\sqrt{3}) \cdot (2-\sqrt{3}) = 4 + 4\sqrt{3} + 3 - 4 + 3 = 6 + 4\sqrt{3}$</p> <p>b) $(3+\sqrt{5}) \cdot (3-\sqrt{5}) + (2-4\sqrt{5}) \cdot (2+4\sqrt{5}) = 9 - 5 + 4 - 80 = -72$</p>	<p>c) $(\sqrt{3}+\sqrt{5}-4\sqrt{7}) \cdot (\sqrt{3}-\sqrt{5}+4\sqrt{7}) = 3 - \sqrt{15} + 4\sqrt{21} + \sqrt{15} - 5 + 4\sqrt{35} - 4\sqrt{21} + 4\sqrt{35} - 112 = 109 + 8\sqrt{35}$</p>
109	<p>a) $\sqrt{7-2\sqrt{6}} \cdot \sqrt{7+2\sqrt{6}} = \sqrt{(7-2\sqrt{6})(7+2\sqrt{6})} = \sqrt{49-24} = \sqrt{25} = 5$</p> <p>b) $\sqrt[3]{5\sqrt{3}-1} \cdot \sqrt[3]{5\sqrt{3}+1} = \sqrt[3]{(5\sqrt{3}+1)(5\sqrt{3}-1)} = \sqrt[3]{75-1} = \sqrt[3]{74}$</p>	<p>c) $\sqrt[3]{\sqrt{3}+\sqrt{2}} \cdot \sqrt[3]{\sqrt{3}-\sqrt{2}} = \sqrt[3]{(\sqrt{3}+\sqrt{2})(\sqrt{3}-\sqrt{2})} = \sqrt[3]{3-2} = 1$</p>
110	<p>a) $\frac{\sqrt[4]{2^3} \cdot 2^{-4} \cdot \sqrt[3]{2}}{2^2 \cdot \sqrt{2} \cdot 2^{\frac{5}{2}}} = \frac{2^{\frac{3}{4}} \cdot 2^{-4} \cdot 2^{\frac{1}{3}}}{2^2 \cdot 2^{\frac{1}{2}} \cdot 2^{\frac{5}{2}}} = \frac{2^{\frac{13}{12}}}{2^{\frac{13}{2}}} = \frac{2^{\frac{13}{12}}}{2^{\frac{26}{12}}} = \sqrt[12]{2^{13}}$</p> <p>b) $\left(81^{\frac{1}{4}} \cdot \sqrt[4]{\frac{1}{3}} \cdot \frac{1}{\sqrt[8]{3}}\right) \cdot \sqrt{3} = \left(3 \cdot 3^{-\frac{1}{4}} \cdot 3^{-\frac{1}{8}}\right) \cdot 3^{\frac{1}{2}} = 3^{\frac{5}{8}} \cdot 3^{\frac{1}{2}} = 3^{\frac{9}{8}} = \sqrt[8]{3^9}$</p>	<p>c) $(\sqrt{14+\sqrt{7-481}})^{\frac{1}{2}} = (\sqrt{14+\sqrt{7-3}})^{\frac{1}{2}} = (\sqrt{14+2})^{\frac{1}{2}} = 4^{\frac{1}{2}} = \frac{1}{\sqrt{4}} = \frac{1}{2}$</p> <p>d) $\left(\sqrt{\frac{a}{9} + \frac{a}{16}}\right)^{-2} = \left(\sqrt{\frac{16a+9a}{144}}\right)^{-2} = \left(\sqrt{\frac{25a}{144}}\right)^{-2} = \left(\frac{5\sqrt{a}}{12}\right)^{-2} = \frac{144}{25a}$</p>
111	<p>a) $(\sqrt[3]{5} \cdot \sqrt{5})^6 = \left(5^{\frac{1}{3}} \cdot 5^{\frac{1}{2}}\right)^6 = \left(5^{\frac{5}{6}}\right)^6 = 5^5$</p> <p>b) $\sqrt[3]{3} \cdot \sqrt[3]{3^2 \sqrt{3}} = 3^{\frac{1}{3}} \cdot \left(3^2 \cdot 3^{\frac{1}{2}}\right)^{\frac{1}{3}} = 3^{\frac{1}{3}} \cdot 3^{\frac{2}{3}} \cdot 3^{\frac{1}{10}} = 3^{\frac{7}{10}}$</p>	<p>c) $\sqrt[3]{2^2} \cdot \sqrt{\sqrt{2}} = \left(2^{\frac{2}{3}}\right)^{\frac{1}{2}} \cdot \left(\left(2^{\frac{1}{2}}\right)^{\frac{1}{2}}\right)^{\frac{1}{2}} = 2^{\frac{1}{3}} \cdot 2^{\frac{1}{8}} = 2^{\frac{11}{24}}$</p> <p>d) $\sqrt[3]{8\sqrt[3]{81}} = \left(2^3 (3^4)^{\frac{1}{3}}\right)^{\frac{1}{3}} = 2 \cdot 3^{\frac{4}{9}}$</p>
112	<p>a) $\frac{6\sqrt{6}-6}{\sqrt{6}} = \frac{(6\sqrt{6}-6)\sqrt{6}}{(\sqrt{6})^2} = \frac{6 \cdot 6 - 6\sqrt{6}}{6} = \frac{6(6-\sqrt{6})}{6} = 6 - \sqrt{6}$</p> <p>b) $\frac{-5}{2\sqrt{5}} = \frac{-5\sqrt{5}}{2(\sqrt{5})^2} = \frac{-5\sqrt{5}}{10} = \frac{-\sqrt{5}}{2}$</p>	<p>c) $\frac{1-\sqrt{2}}{\sqrt{2}} = \frac{(1-\sqrt{2})\sqrt{2}}{(\sqrt{2})^2} = \frac{\sqrt{2}-2}{2}$</p> <p>d) $\frac{5\sqrt{3}-4}{\sqrt[3]{-3^2}} = \frac{(5\sqrt{3}-4)\sqrt[3]{-3^2}}{\sqrt[3]{-3^2} \cdot \sqrt[3]{-3^2}} = \frac{-15\sqrt[3]{3} + 4\sqrt[3]{-3^3}}{-3} = \frac{15\sqrt[3]{3} - 4\sqrt[3]{-3^3}}{3}$</p>

113	<p>a) $\frac{1}{\sqrt{2}+1} = \frac{\sqrt{2}-1}{(\sqrt{2}+1)(\sqrt{2}-1)} = \frac{\sqrt{2}-1}{2-1} = \sqrt{2}-1$</p> <p>b) $\frac{3}{\sqrt{2}+\sqrt{3}} = \frac{3(\sqrt{2}-\sqrt{3})}{(\sqrt{2}+\sqrt{3})(\sqrt{2}-\sqrt{3})} = \frac{3(\sqrt{2}-\sqrt{3})}{2-3} = -3(\sqrt{2}-\sqrt{3})$</p>	<p>c) $\frac{-5}{\sqrt{3}-2} = \frac{-5(\sqrt{3}+2)}{(\sqrt{3}-2)(\sqrt{3}+2)} = \frac{-5\sqrt{3}-10}{3-4} = 5\sqrt{3}+10$</p> <p>d) $\frac{4\sqrt{2}}{3\sqrt{2}-\sqrt{5}} = \frac{4\sqrt{2}(3\sqrt{2}+\sqrt{5})}{(3\sqrt{2}-\sqrt{5})(3\sqrt{2}+\sqrt{5})} = \frac{24+4\sqrt{10}}{18-5} = \frac{24+4\sqrt{10}}{13}$</p>
114	<p>a) $\frac{-1}{2 \cdot (\sqrt{5}-\sqrt{3})} = \frac{-\sqrt{5}-\sqrt{3}}{2(\sqrt{5}-\sqrt{3})(\sqrt{5}+\sqrt{3})} = \frac{-\sqrt{5}-\sqrt{3}}{4}$</p> <p>b) $\frac{5}{3 \cdot (\sqrt{7}+\sqrt{2})} = \frac{5(\sqrt{7}-\sqrt{2})}{3(\sqrt{7}+\sqrt{2})(\sqrt{7}-\sqrt{2})} = \frac{5(\sqrt{7}-\sqrt{2})}{15} = \frac{\sqrt{7}-\sqrt{2}}{3}$</p>	<p>c) $\frac{8}{5 \cdot (\sqrt{10}-\sqrt{6})} = \frac{8(\sqrt{10}+\sqrt{6})}{5(\sqrt{10}-\sqrt{6})(\sqrt{10}+\sqrt{6})} = \frac{8(\sqrt{10}+\sqrt{6})}{20} = \frac{2(\sqrt{10}+\sqrt{6})}{5}$</p> <p>d) $\frac{-7}{9 \cdot (\sqrt{6}+\sqrt{3})} = \frac{-7(\sqrt{6}-\sqrt{3})}{9(\sqrt{6}+\sqrt{3})(\sqrt{6}-\sqrt{3})} = \frac{-7(\sqrt{6}-\sqrt{3})}{27}$</p>
115	<p>a) $\frac{1}{\sqrt{3}+\sqrt{6}} = \frac{\sqrt{3}+\sqrt{6}}{\sqrt{3}+\sqrt{6} \cdot \sqrt{3}+\sqrt{6}} = \frac{\sqrt{3}+\sqrt{6}}{3+\sqrt{6}} = \frac{\sqrt{3}+\sqrt{6}(3-\sqrt{6})}{(3+\sqrt{6})(3-\sqrt{6})} = \frac{3\sqrt{3}+\sqrt{6}-\sqrt{18}+6\sqrt{6}}{9-6} = \frac{3\sqrt{3}+\sqrt{6}-\sqrt{18}+6\sqrt{6}}{3}$</p> <p>c) $\frac{5\sqrt{3}-1}{3}$ d) $\frac{12+\sqrt{21}}{6}$</p>	<p>b) $\frac{1}{1-\sqrt{5}+\sqrt{7}} = \frac{1+\sqrt{5}-\sqrt{7}}{(1-\sqrt{5}+\sqrt{7})(1+\sqrt{5}-\sqrt{7})} = \frac{1+\sqrt{5}-\sqrt{7}}{1+\sqrt{5}-\sqrt{7}-\sqrt{5}-5+\sqrt{35}+\sqrt{7}+\sqrt{35}-7} = \frac{1+\sqrt{5}-\sqrt{7}}{-11+2\sqrt{35}} = \frac{(1+\sqrt{5}-\sqrt{7})(-11-2\sqrt{35})}{(-11+2\sqrt{35})(-11-2\sqrt{35})} = \frac{-11-11\sqrt{5}+11\sqrt{7}-2\sqrt{35}-2\sqrt{175}+2\sqrt{245}}{121-140} = \frac{-11-11\sqrt{5}+11\sqrt{7}-2\sqrt{35}-2\sqrt{175}+2\sqrt{245}}{-19}$</p>
116	<p>a) $\frac{3}{(3\sqrt{2}-5) \cdot (4\sqrt{2}-3)} = \frac{3}{24-9\sqrt{2}-20\sqrt{2}+15} = \frac{3}{39-29\sqrt{2}} = \frac{3(39+29\sqrt{2})}{(39-29\sqrt{2})(39+29\sqrt{2})} = \frac{117+87\sqrt{2}}{1521-1682} = \frac{117+87\sqrt{2}}{-161}$</p> <p>b) $\frac{-2}{\sqrt[3]{4} \cdot (5\sqrt{3}-1)} = \frac{-2(5\sqrt{3}+1)}{\sqrt[3]{4} \cdot (5\sqrt{3}-1)(5\sqrt{3}+1)} = \frac{-2(5\sqrt{3}+1)}{74\sqrt[3]{4}} = \frac{-5\sqrt{3}-1}{37\sqrt[3]{4}} = \frac{(-5\sqrt{3}-1)\sqrt[3]{4^2}}{37\sqrt[3]{4} \cdot \sqrt[3]{4^2}} = \frac{-5\sqrt[3]{3^3 \cdot 4^3} - \sqrt[3]{4^3}}{148}$</p>	<p>c) $\frac{-\sqrt{2}}{\sqrt[3]{2} \cdot (\sqrt{125}+2)} = \frac{-\sqrt{2}(\sqrt{125}-2)}{\sqrt[3]{2} \cdot (\sqrt{125}+2)(\sqrt{125}-2)} = \frac{-\sqrt{250}+2\sqrt{2}}{121\sqrt[3]{2}} = \frac{(-\sqrt{250}+2\sqrt{2})\sqrt[3]{2^2}}{121\sqrt[3]{2} \cdot \sqrt[3]{2^2}} = \frac{-5 \cdot 2\sqrt[3]{5^3 \cdot 2} + 2\sqrt[3]{2^3}}{121\sqrt[3]{2} \cdot \sqrt[3]{2^2}} = \frac{2(-5\sqrt[3]{5^3 \cdot 2} + 2\sqrt[3]{2})}{242} = \frac{-5\sqrt[3]{5^3 \cdot 2} + 2\sqrt[3]{2}}{121}$</p> <p>d) $\frac{-4}{\sqrt[3]{3} \cdot \sqrt[3]{2}} = \frac{-4}{\sqrt[3]{3^3 \cdot 2^3}} = \frac{-4}{\sqrt[3]{24}} = \frac{-4}{\sqrt[3]{3^3 \cdot 2^3}} = \frac{-4\sqrt[3]{3^3 \cdot 2^3}}{\sqrt[3]{3^3 \cdot 2^3} \cdot \sqrt[3]{3^3 \cdot 2^3}} = \frac{-4\sqrt[3]{3^9 \cdot 2^9}}{\sqrt[3]{3^9 \cdot 2^9} \cdot \sqrt[3]{3^9 \cdot 2^9}} = \frac{-4\sqrt[3]{3^9 \cdot 2^9}}{6 \cdot 3} = \frac{-4\sqrt[3]{3^9 \cdot 2^9}}{18}$</p>
138	<p>a) $\frac{2}{\sqrt{2}+\sqrt{3}+\sqrt{4}} = \frac{2(\sqrt{2}-\sqrt{3}-2)}{(\sqrt{2}+\sqrt{3}+2)(\sqrt{2}-\sqrt{3}-2)} = \frac{2(\sqrt{2}-\sqrt{3}-2)}{2(\sqrt{2}-\sqrt{3}-2)(-5+2\sqrt{12})} = \frac{-5-2\sqrt{12}}{(-5-2\sqrt{12})(-5+2\sqrt{12})} = \frac{-10\sqrt{2}+4\sqrt{24}+10\sqrt{3}-24-20-8\sqrt{12}}{25-48} = \frac{10\sqrt{2}-8\sqrt{6}-10\sqrt{3}+4+16\sqrt{3}}{23} = \frac{10\sqrt{2}-8\sqrt{6}+4+6\sqrt{3}}{23}$</p> <p>b) $\frac{2}{2\sqrt{2}-3\sqrt{3}+\sqrt{4}} = \frac{2(2\sqrt{2}+3\sqrt{3}-2)}{(2\sqrt{2}-3\sqrt{3}+2)(2\sqrt{2}+3\sqrt{3}-2)} = \frac{2(2\sqrt{2}+3\sqrt{3}-2)}{-23+12\sqrt{3}} = \frac{2(2\sqrt{2}+3\sqrt{3}-2)(-23-12\sqrt{3})}{(-23+12\sqrt{3})(-23-12\sqrt{3})} = \frac{-92\sqrt{2}-48\sqrt{6}-138\sqrt{3}-216+92+48\sqrt{3}}{97} = \frac{-92\sqrt{2}-48\sqrt{6}-90\sqrt{3}-124}{97}$</p>	<p>c) $\frac{\sqrt[3]{2}}{\sqrt{6}-5\sqrt{5}-6\sqrt{3}} = \frac{\sqrt[3]{2}(\sqrt{6}+5\sqrt{5}+6\sqrt{3})}{(\sqrt{6}-5\sqrt{5}-6\sqrt{3})(\sqrt{6}+5\sqrt{5}+6\sqrt{3})} = \frac{\sqrt[3]{2}(\sqrt{6}+5\sqrt{5}+6\sqrt{3})}{-227-60\sqrt{15}} = \frac{\sqrt[3]{2}(\sqrt{6}+5\sqrt{5}+6\sqrt{3})(-137-60\sqrt{15})}{-2471} = \frac{\sqrt[3]{2}(\sqrt{6}+5\sqrt{5}+6\sqrt{3})(-137+60\sqrt{15})}{-2471}$</p>