

Lösung A1

- a) $\sqrt{8} \cdot \sqrt{2} = \sqrt{8 \cdot 2} = \sqrt{16} = 4$
- b) $\sqrt{5} \cdot \sqrt{20} = \sqrt{5 \cdot 20} = \sqrt{100} = 10$
- c) $\sqrt{32} \cdot \sqrt{2} = \sqrt{32 \cdot 2} = \sqrt{64} = 8$
- d) $\sqrt{28} \cdot \sqrt{7} = \sqrt{28 \cdot 7} = \sqrt{196} = 14$
- e) $\sqrt{3} \cdot \sqrt{75} = \sqrt{3 \cdot 75} = \sqrt{225} = 15$
- f) $\sqrt{45} \cdot \sqrt{5} = \sqrt{45 \cdot 5} = \sqrt{225} = 15$
- g) $\sqrt{125} \cdot \sqrt{5} = \sqrt{125 \cdot 5} = \sqrt{625} = 25$
- h) $\sqrt{0,5} \cdot \sqrt{8} = \sqrt{0,5 \cdot 8} = \sqrt{4} = 2$
- i) $\sqrt{\frac{7}{32}} \cdot \sqrt{3\frac{1}{2}} = \sqrt{\frac{7}{32} \cdot \frac{7}{2}} = \sqrt{\frac{49}{64}} = \frac{7}{8}$

Lösung A2

- a) $\sqrt{\frac{3}{8}} \cdot \sqrt{24} = \sqrt{\frac{3}{8} \cdot 24} = \sqrt{9} = 3$
- b) $\sqrt{\frac{4}{7}} \cdot \sqrt{\frac{7}{9}} = \sqrt{\frac{4 \cdot 7}{7 \cdot 9}} = \sqrt{\frac{4}{9}} = \frac{2}{3}$
- c) $\sqrt{3} \cdot \sqrt{5} \cdot \sqrt{15} = \sqrt{3 \cdot 5 \cdot 15} = \sqrt{15 \cdot 15} = 15$
- d) $\sqrt{\frac{17}{20}} \cdot \sqrt{\frac{5}{68}} = \sqrt{\frac{17}{20} \cdot \frac{5}{68}} = \sqrt{\frac{1}{16}} = \frac{1}{4}$
- e) $\sqrt{0,45} \cdot \sqrt{0,8} = \sqrt{0,45 \cdot 0,8} = \sqrt{0,36} = 0,6$
- f) $\sqrt{2} \cdot \sqrt{3} \cdot \sqrt{24} = \sqrt{2 \cdot 3 \cdot 24} = \sqrt{144} = 12$
- g) $\sqrt{3} \cdot \sqrt{6} \cdot \sqrt{32} = \sqrt{3 \cdot 6 \cdot 32} = \sqrt{576} = 24$
- h) $\sqrt{6} \cdot \sqrt{32} \cdot \sqrt{\frac{1}{3}} = \sqrt{6 \cdot 32 \cdot \frac{1}{3}} = \sqrt{64} = 8$
- i) $\sqrt{3} \cdot \sqrt{\frac{8}{7}} \cdot \sqrt{\frac{3}{14}} = \sqrt{3 \cdot \frac{8}{7} \cdot \frac{3}{14}} = \sqrt{\frac{36}{49}} = \frac{6}{7}$

Lösung A3

- a) $3\sqrt{2} \cdot 5\sqrt{2} = 15\sqrt{2 \cdot 2} = 15\sqrt{4} = 30$
- b) $7\sqrt{5} : 3\sqrt{5} = \frac{7}{3} \sqrt{\frac{5}{5}} = \frac{7}{3} \sqrt{1} = \frac{7}{3}$
- c) $3\sqrt{3} \cdot 8\sqrt{3} \cdot (-2\sqrt{3}) = -48\sqrt{3 \cdot 3 \cdot 3} = -48\sqrt{9 \cdot 3} = -147 \cdot \sqrt{3}$
- d) $4\sqrt{7} \cdot 5\sqrt{7} \cdot 8\sqrt{7} : 6\sqrt{7} = \frac{160}{6} \sqrt{7 \cdot 7 \cdot 7 : 7} = \frac{80}{3} \sqrt{49} = \frac{560}{3}$
- e) $2\sqrt{13} \cdot 8\sqrt{13} \cdot (-15\sqrt{13}) = -240\sqrt{13 \cdot 13 \cdot 13} = -240\sqrt{169 \cdot 13} = -3120 \cdot \sqrt{13}$
- f) $5\sqrt{10} \cdot 3\sqrt{10} - 8\sqrt{10} \cdot 4\sqrt{10} = 15\sqrt{10 \cdot 10} - 32\sqrt{10 \cdot 10} = 15 \cdot 10 - 32 \cdot 10 = -170$
- g) $(4,2\sqrt{11} - 2,7\sqrt{11}) \cdot (0,2\sqrt{11} - \sqrt{11}) = 1,5\sqrt{11} \cdot (-0,8\sqrt{11}) = -1,2\sqrt{11 \cdot 11} = -13,2$

Lösung A4

- a) $3\sqrt{2} \cdot 4\sqrt{2} = 12\sqrt{2 \cdot 2} = 12\sqrt{4} = 24$
- b) $9\sqrt{3} : 7\sqrt{3} = \frac{9}{7} \sqrt{\frac{3}{3}} = \frac{9}{7} \sqrt{1} = \frac{9}{7}$
- c) $12\sqrt{11} \cdot 5\sqrt{11} = 60\sqrt{11 \cdot 11} = 60 \cdot 11 = 660$
- d) $4\sqrt{6} \cdot 3\sqrt{6} \cdot (-2\sqrt{6}) = -24\sqrt{6 \cdot 6 \cdot 6} = -24\sqrt{36 \cdot 6} = -24 \cdot 6 \cdot \sqrt{6} = -144\sqrt{6}$
- e) $4\sqrt{x} \cdot 3\sqrt{x} = 12\sqrt{x \cdot x} = 12\sqrt{x^2} = 12x$
- f) $14\sqrt{x} : 9\sqrt{x} = \frac{14}{9} \sqrt{\frac{x}{x}} = \frac{14}{9} \sqrt{1} = \frac{14}{9}$
- g) $(2\sqrt{a} - 3\sqrt{a}) \cdot (-\sqrt{a}) = -2\sqrt{a \cdot a} + 3\sqrt{a \cdot a} = -2a + 3a = a$
- h) $3\sqrt{x} \cdot (-2\sqrt{x}) \cdot 4\sqrt{x} = -6 \sqrt{\frac{x}{x} \cdot x} = -6\sqrt{1 \cdot x} = -6\sqrt{x}$

Lösung A1

- a) $\frac{\sqrt{8}}{\sqrt{2}} = \sqrt{\frac{8}{2}} = \sqrt{4} = 2$
- b) $\frac{\sqrt{2}}{\sqrt{8}} = \sqrt{\frac{2}{8}} = \sqrt{\frac{1}{4}} = \frac{1}{2}$
- c) $\sqrt{12,5} : \sqrt{0,5} = \sqrt{25} = 5$
- d) $\frac{\sqrt{1,25}}{\sqrt{5}} = \sqrt{\frac{1,25}{5}} = \sqrt{0,25} = 0,5$
- e) $\sqrt{5} : \sqrt{1,8} = \sqrt{\frac{5}{1,8}} = \sqrt{\frac{25}{9}} = \frac{5}{3}$
- f) $\frac{\sqrt{68}}{\sqrt{17}} = \sqrt{\frac{68}{17}} = \sqrt{4} = 2$
- g) $\frac{\sqrt{360}}{\sqrt{40}} = \sqrt{\frac{360}{40}} = \sqrt{9} = 3$
- h) $\sqrt{147} : \sqrt{3} = \sqrt{\frac{147}{3}} = \sqrt{49} = 7$
- i) $\sqrt{\frac{3}{35}} : \sqrt{\frac{5}{21}} = \sqrt{\frac{3}{35} \cdot \frac{21}{5}} = \sqrt{\frac{63}{175}} = \sqrt{\frac{9}{25}} = \frac{3}{5}$

Lösung A2

- a) $\frac{\sqrt{\frac{2}{15}}}{\sqrt{\frac{5}{24}}} = \sqrt{\frac{2}{15} \cdot \frac{24}{5}} = \sqrt{\frac{2 \cdot 8}{5 \cdot 5}} = \sqrt{\frac{16}{25}} = \frac{4}{5}$
- b) $\sqrt{\frac{xy^2}{x}} = \sqrt{y^2} = y$
- c) $\frac{\sqrt{8a^3}}{\sqrt{2a}} = \sqrt{4a^2} = 2a$
- d) $\frac{\sqrt{a^3b}}{\sqrt{ab^3}} = \sqrt{\frac{a^3b}{ab^3}} = \sqrt{\frac{a^2}{b^2}} = \frac{a}{b}$
- e) $\frac{\sqrt{24x^2yz}}{\sqrt{6y^3z^3}} = \sqrt{\frac{24x^2yz}{6y^3z^3}} = \sqrt{\frac{4x^2}{y^2z^2}} = \frac{4x}{yz}$
- f) $\sqrt{\frac{2a^3bc}{128}} : \sqrt{\frac{2,7ac}{4,8b}} = \sqrt{\frac{2a^3bc}{128} \cdot \frac{4,8b}{2,7ac}} = \sqrt{\frac{9,6a^2b^2}{345,6}} = \sqrt{\frac{a^2b^2}{36}} = \frac{ab}{6}$
- g) $\frac{\sqrt{8} \cdot \sqrt{3}}{\sqrt{6}} = \sqrt{\frac{24}{6}} = \sqrt{4} = 2$
- h) $\frac{\sqrt{5} \cdot \sqrt{15}}{\sqrt{3}} = \sqrt{\frac{75}{3}} = \sqrt{25} = 5$
- i) $\frac{\sqrt{250}}{\sqrt{5} \cdot \sqrt{2}} = \sqrt{\frac{250}{10}} = \sqrt{25} = 5$

Lösung A3

- a) $\frac{\sqrt{3xy}}{\sqrt{7x} \cdot \sqrt{21y}} = \sqrt{\frac{3xy}{7 \cdot 21xy}} = \sqrt{\frac{1}{49}} = \frac{1}{7}$
- b) $\frac{\sqrt{a^3} \cdot \sqrt{ab}}{\sqrt{a^3b} \cdot \sqrt{a}} = \sqrt{\frac{a^4b}{a^4b}} = 1$
- c) $\frac{\sqrt{27a} \cdot \sqrt{162b^2}}{\sqrt{12} \cdot \sqrt{18a}} = \sqrt{\frac{27 \cdot 162 \cdot ab^2}{12 \cdot 18a}} = \sqrt{20,25b^2} = 4,5b$

$$\begin{aligned}
 \text{d)} \quad & \frac{\sqrt{0,24} \cdot \sqrt{3,6}}{\sqrt{1,2} \cdot \sqrt{8}} = \sqrt{\frac{0,864}{9,6}} = \sqrt{0,09} = 0,3 \\
 \text{e)} \quad & \frac{\sqrt{24ab^2} \cdot \sqrt{50a^3b}}{\sqrt{8a} \cdot \sqrt{6ab}} = \sqrt{\frac{24b^2 \cdot 50a^2}{8 \cdot 6}} = \sqrt{25a^2b^2} = 5ab \\
 \text{f)} \quad & \frac{\sqrt{\frac{7}{12}} \sqrt{\frac{4}{21}}}{\sqrt{\frac{3}{8}} \sqrt{\frac{3}{2}}} = \sqrt{\frac{28}{252}} = \sqrt{\frac{28}{252} \cdot \frac{16}{9}} = \sqrt{\frac{448}{2268}} = \sqrt{\frac{16}{81}} = \frac{4}{9}
 \end{aligned}$$

Lösung A4

$$\begin{aligned}
 \text{a)} \quad & \frac{\sqrt{72}}{\sqrt{2}} = \sqrt{36} = 6 \\
 \text{b)} \quad & \frac{\sqrt{125}}{\sqrt{5}} = \sqrt{25} = 5 \\
 \text{c)} \quad & \frac{\sqrt{20}}{\sqrt{\frac{4}{5}}} = \sqrt{20 \cdot \frac{5}{4}} = \sqrt{25} = 5 \\
 \text{d)} \quad & \frac{\sqrt{\frac{1}{3}}}{\sqrt{\frac{3}{4}}} = \sqrt{\frac{1}{3} \cdot \frac{4}{3}} = \sqrt{\frac{4}{9}} = \frac{2}{3} \\
 \text{e)} \quad & \frac{\sqrt{x^3}}{\sqrt{x}} = \sqrt{x^2} = x \\
 \text{f)} \quad & \frac{\sqrt{\frac{a^2}{b}}}{\sqrt{b}} = \sqrt{\frac{a^2}{b} \cdot \frac{1}{b}} = \sqrt{\frac{a^2}{b^2}} = \frac{a}{b} \\
 \text{g)} \quad & \frac{\sqrt{xy}}{\sqrt{\frac{x}{y}}} = \sqrt{xy \cdot \frac{y}{x}} = \sqrt{y^2} = y \\
 \text{h)} \quad & \frac{\sqrt{x^2y^3}}{\sqrt{y}} = \sqrt{x^2y^2} = xy
 \end{aligned}$$

Lösung A1

a) $\sqrt{5} \cdot 2\sqrt{3} \cdot 3\sqrt{5} \cdot 5\sqrt{3} = 2 \cdot 3 \cdot 5 \cdot \sqrt{5} \cdot \sqrt{3} \cdot \sqrt{5} \cdot \sqrt{3} = 30 \cdot \sqrt{5^2} \cdot \sqrt{3^2} = 30 \cdot 5 \cdot 3 = 450$

b) $\sqrt{11} \cdot 3\sqrt{15} \cdot 2\sqrt{10} \cdot \sqrt{11} \cdot 5\sqrt{15} = 3 \cdot 2 \cdot 5 \cdot \sqrt{11^2} \cdot \sqrt{15^2} = 30 \cdot 11 \cdot 15 = 4950$

c) $3\sqrt{27} \cdot 5\sqrt{75} : \sqrt{3} = \frac{3\sqrt{27} \cdot 5\sqrt{75}}{\sqrt{3}} = \frac{3 \cdot \sqrt{3} \cdot 9 \cdot 5\sqrt{75}}{\sqrt{3}} = 3 \cdot 3 \cdot 5 \cdot \sqrt{75} = 45 \cdot \sqrt{3 \cdot 25} = 225\sqrt{3}$

d) $\frac{6\sqrt{20}}{3\sqrt{80}} - \frac{2\sqrt{24}}{4\sqrt{54}} = \frac{2}{\sqrt{4}} - \frac{1}{2} \cdot \frac{2}{3} = 1 - \frac{1}{3} = \frac{2}{3}$

e) $5\sqrt{162} \cdot (3\sqrt{125} : 2\sqrt{45}) \cdot \frac{1}{10\sqrt{50}} = 5 \cdot 9\sqrt{2} \cdot \frac{3 \cdot 5\sqrt{5}}{2 \cdot 3\sqrt{5}} \cdot \frac{1}{10 \cdot 5\sqrt{2}} = \frac{5 \cdot 9\sqrt{2}}{10 \cdot 5\sqrt{2}} \cdot \frac{3 \cdot 5\sqrt{5}}{2 \cdot 3\sqrt{5}} = \frac{9}{10} \cdot \frac{5}{2} = \frac{9}{4}$

Lösung A2

a) $3\sqrt{2} : 2\sqrt{3} \cdot \sqrt{2} : \sqrt{3} \cdot 2\sqrt{2} = \frac{3\sqrt{2} \cdot \sqrt{2} \cdot 2\sqrt{2}}{2\sqrt{3} \cdot \sqrt{3}} = 2\sqrt{2}$

b) $3\sqrt{5} : 2\sqrt{3} \cdot 5\sqrt{5} : \sqrt{3} \cdot 2\sqrt{5} = \frac{3\sqrt{5} \cdot 5\sqrt{5} \cdot 2\sqrt{5}}{2\sqrt{3} \cdot \sqrt{3}} = \frac{3 \cdot 5 \cdot 2 \cdot \sqrt{5}}{2 \cdot 3} = 5\sqrt{5}$

c) $\frac{1,5\sqrt{2} \cdot 3\sqrt{3}}{2,5\sqrt{3} \cdot 4\sqrt{2}} \cdot \frac{3,5\sqrt{2}}{5,5\sqrt{3}} = \frac{1,5 \cdot 3}{2,5 \cdot 4} \cdot \frac{7 \cdot \sqrt{2}}{11 \cdot \sqrt{3}} = \frac{9}{20} \cdot \frac{7 \cdot \sqrt{2}}{11 \cdot \sqrt{3}} = \frac{63\sqrt{2}}{220\sqrt{3}} = \frac{63\sqrt{2} \cdot \sqrt{3}}{220\sqrt{3} \cdot \sqrt{3}} = \frac{21 \cdot \sqrt{6}}{220}$

d) $2\sqrt{27} \cdot 0,5\sqrt{75} \cdot 4\sqrt{192} : (\sqrt{3} \cdot 4\sqrt{675} \cdot 1,5\sqrt{867}) = \frac{2 \cdot 3 \cdot \sqrt{3} \cdot 0,5 \cdot 5 \cdot \sqrt{3} \cdot 4 \cdot 8 \cdot \sqrt{3}}{\sqrt{3} \cdot 4 \cdot 15 \cdot \sqrt{3} \cdot 1,5 \cdot 17 \cdot \sqrt{3}} = \frac{480}{630} = \frac{16}{21}$

e) $\frac{5,6\sqrt{363} \cdot 5,1\sqrt{343} \cdot 4,4\sqrt{243}}{7,8\sqrt{567} \cdot 2,7\sqrt{108}} = \frac{5,6 \cdot 11 \cdot \sqrt{3} \cdot 5,1 \cdot 7\sqrt{7} \cdot 4,4 \cdot 9\sqrt{3}}{7,8 \cdot 9 \cdot \sqrt{7} \cdot 2,7 \cdot 6\sqrt{3}} = \frac{5,6 \cdot 11 \cdot 5,1 \cdot 7 \cdot 4,4 \cdot 9 \cdot \sqrt{3}}{7,8 \cdot 9 \cdot 2,7 \cdot 6}$

$$= \frac{87085,152}{1137,24} \cdot \sqrt{3} \approx 56,58 \cdot \sqrt{3}$$

Lösung A1

- a) $3\sqrt{2} \cdot 5\sqrt{8} = 3 \cdot 5 \cdot \sqrt{2} \cdot \sqrt{8} = 15 \cdot \sqrt{2 \cdot 8} = 15\sqrt{16} = 15 \cdot 4 = 60$
- b) $7\sqrt{3} : 2\sqrt{27} = \frac{7}{2} \cdot \sqrt{\frac{3}{27}} = \frac{7}{2} \cdot \frac{1}{3} = \frac{7}{6}$
- c) $\sqrt{75} : \sqrt{27} = \frac{\sqrt{25 \cdot 3}}{\sqrt{9 \cdot 3}} = \frac{5 \cdot \sqrt{3}}{3 \cdot \sqrt{3}} = \frac{5}{3}$
- d) $2\sqrt{96} \cdot 3\sqrt{150} = 2 \cdot 3 \cdot \sqrt{16 \cdot 6} \cdot \sqrt{25 \cdot 6} = 6 \cdot 4 \cdot \sqrt{6} \cdot 5 \cdot \sqrt{6} = 12\sqrt{6^2} = 120 \cdot 6 = 720$
- e) $2\sqrt{6} \cdot 4\sqrt{20} : 5\sqrt{24} : 6\sqrt{5} = \frac{2\sqrt{6} \cdot 4\sqrt{4 \cdot 5}}{5\sqrt{4 \cdot 6} \cdot 6\sqrt{5}} = \frac{2 \cdot 4 \cdot \sqrt{6} \cdot 2 \cdot \sqrt{5}}{5 \cdot 6 \cdot 2 \cdot \sqrt{6} \cdot \sqrt{5}} = \frac{8}{30} = \frac{4}{15}$
- f) $\frac{3\sqrt{48} \cdot 7\sqrt{32}}{\sqrt{128} \cdot \sqrt{108}} = \frac{3\sqrt{16 \cdot 3} \cdot 7\sqrt{16 \cdot 2}}{\sqrt{64 \cdot 2} \cdot \sqrt{36 \cdot 3}} = \frac{3 \cdot 7 \cdot 4 \cdot \sqrt{3} \cdot 4 \cdot \sqrt{2}}{8 \cdot \sqrt{2} \cdot 6 \cdot \sqrt{3}} = 7$
- g) $\frac{4\sqrt{45}}{3\sqrt{5}} \cdot \frac{2\sqrt{20}}{2\sqrt{605}} = \frac{4\sqrt{9 \cdot 5}}{3\sqrt{5}} \cdot \frac{2\sqrt{4 \cdot 5}}{2\sqrt{121 \cdot 5}} = \frac{4 \cdot 3 \cdot \sqrt{5} \cdot 2 \cdot \sqrt{5}}{3 \cdot \sqrt{5} \cdot 2 \cdot 11 \cdot \sqrt{5}} = \frac{8}{11}$
- h) $7\sqrt{600} : 8\sqrt{28} \cdot 13\sqrt{150} : 5\sqrt{63} = \frac{7\sqrt{100 \cdot 6}}{8\sqrt{4 \cdot 7}} \cdot \frac{13\sqrt{25 \cdot 6}}{5\sqrt{9 \cdot 7}} = \frac{7 \cdot 10 \cdot \sqrt{6} \cdot 13 \cdot 5 \cdot \sqrt{6}}{8 \cdot 2 \cdot \sqrt{7} \cdot 5 \cdot 3 \cdot \sqrt{7}} = \frac{4550 \cdot \sqrt{6^2}}{240 \cdot \sqrt{7^2}} = \frac{65}{4}$
- i) $\frac{3\sqrt{405} \cdot 5\sqrt{245}}{7\sqrt{320}} = \frac{3\sqrt{81 \cdot 5} \cdot 5\sqrt{49 \cdot 5}}{7\sqrt{64 \cdot 5}} = \frac{3 \cdot 9 \cdot \sqrt{5} \cdot 5 \cdot 7 \cdot \sqrt{5}}{7 \cdot 8 \cdot \sqrt{5}} = \frac{945 \cdot \sqrt{5^2}}{56 \cdot \sqrt{5}} = \frac{135}{8} \cdot \sqrt{5}$
- j) $\frac{4\sqrt{108} \cdot \sqrt{98}}{7\sqrt{75} \cdot 0,5\sqrt{450}} = \frac{4\sqrt{36 \cdot 3} \cdot \sqrt{49 \cdot 2}}{7\sqrt{25 \cdot 3} \cdot 0,5\sqrt{225 \cdot 2}} = \frac{4 \cdot 6 \cdot \sqrt{3} \cdot 7 \cdot \sqrt{2}}{7 \cdot 5 \cdot \sqrt{3} \cdot 0,5 \cdot 15 \cdot \sqrt{2}} = \frac{16}{25}$
- k) $0,7\sqrt{80} \cdot 1,4\sqrt{363} \cdot 1,1\sqrt{500} : 2,2\sqrt{147} = \frac{0,7\sqrt{16 \cdot 5} \cdot 1,4\sqrt{121 \cdot 3} \cdot 1,1\sqrt{100 \cdot 5}}{2,2\sqrt{49 \cdot 3}} =$
 $\frac{0,7 \cdot 4 \cdot \sqrt{5} \cdot 1,4 \cdot 11 \cdot \sqrt{3} \cdot 1,1 \cdot 10 \cdot \sqrt{5}}{2,2 \cdot 7 \cdot \sqrt{3}} = \frac{474,32 \cdot \sqrt{5^2}}{15,4} = 30,8 \cdot 5 = 154$
- l) $\frac{\sqrt{75}}{\sqrt{360}} \cdot \frac{1}{\sqrt{48}} = \frac{\sqrt{25 \cdot 3}}{\sqrt{36 \cdot 10}} \cdot \frac{1}{\sqrt{16 \cdot 3}} = \frac{5\sqrt{3}}{6\sqrt{10} \cdot 4\sqrt{3}} = \frac{5}{24\sqrt{10}} = \frac{5\sqrt{10}}{240} = \frac{\sqrt{10}}{48}$
- m) $5\sqrt{x^3} : 2\sqrt{x} : \sqrt{9x} = \frac{5x\sqrt{x}}{2\sqrt{x} \cdot 3\sqrt{x}} = \frac{5\sqrt{x}}{6} = \frac{5}{6}\sqrt{x}$
- n) $\frac{7a\sqrt{a} \cdot 8\sqrt{a^3} \cdot \sqrt{64a}}{5\sqrt{a}} = \frac{7a\sqrt{a} \cdot 8a\sqrt{a} \cdot 8\sqrt{a}}{5\sqrt{a}} = \frac{448a^3\sqrt{a}}{5\sqrt{a}} = \frac{448}{5}a^3$
- o) $\frac{3\sqrt{252} \cdot 7\sqrt{99}}{2\sqrt{175} \cdot 8\sqrt{44}} = \frac{3\sqrt{36 \cdot 7} \cdot 7\sqrt{9 \cdot 11}}{2\sqrt{25 \cdot 7} \cdot 8\sqrt{4 \cdot 11}} = \frac{3 \cdot 6 \cdot \sqrt{7} \cdot 7 \cdot 3 \cdot \sqrt{11}}{2 \cdot 5 \cdot \sqrt{7} \cdot 8 \cdot 2 \cdot \sqrt{11}} = \frac{189}{80}$

Lösung A1

- a) $4\sqrt{3} \cdot 2\sqrt{12} - 2\sqrt{3} \cdot 8\sqrt{12} = 8 \cdot \sqrt{36} + \frac{1}{4} \cdot \sqrt{\frac{1}{4}} = 8 \cdot 6 - \frac{1}{8} = \frac{383}{8}$
- b) $6\sqrt{8} \cdot 5\sqrt{2} - 3\sqrt{2} \cdot 9\sqrt{8} = 30\sqrt{16} - \frac{1}{3} \cdot \sqrt{\frac{1}{4}} = 120 - \frac{1}{6} = \frac{719}{6}$
- c) $4\sqrt{10} \cdot 3\sqrt{10} - \sqrt{11} \cdot 4\sqrt{11} = 12 \cdot \sqrt{100} - 4\sqrt{121} = 120 - 44 = 76$
- d) $\frac{9\sqrt{14}}{3\sqrt{21}} \cdot \frac{6\sqrt{14}}{18\sqrt{21}} = \frac{54 \cdot 14}{54 \cdot 21} = \frac{2}{3}$
- e) $5\sqrt{x} \cdot 2\sqrt{y} - 3\sqrt{x} \cdot 4\sqrt{y} = 10\sqrt{xy} - 12\sqrt{xy} = 2\sqrt{xy}$
- f) $5\sqrt{a} \cdot 6\sqrt{b} + 8\sqrt{b} \cdot 7\sqrt{a} = 30\sqrt{ab} - 12\sqrt{ab} = 18\sqrt{ab}$
- g) $\frac{8\sqrt{2x}}{7\sqrt{3y}} \cdot \frac{3\sqrt{3y}}{5\sqrt{2x}} = \frac{8 \cdot 3}{7 \cdot 5} = \frac{24}{35}$
- h) $\frac{12\sqrt{p} \cdot 3\sqrt{3q}}{6\sqrt{p} \cdot 5\sqrt{3q}} = \frac{12 \cdot 3}{6 \cdot 5} = \frac{6}{5}$
- i) $\frac{5\sqrt{a} \cdot 7\sqrt{b}}{5\sqrt{a}} = 7\sqrt{b}$
- j) $5\sqrt{x} \cdot (10\sqrt{x^2} + 20\sqrt{xy}) \cdot (\sqrt{x} + 2\sqrt{y}) = \frac{5\sqrt{x} \cdot (\sqrt{x} + 2\sqrt{y})}{10x + 20\sqrt{xy}} = \frac{5x + 10\sqrt{xy}}{10x + 20\sqrt{xy}} = \frac{5(x + 2\sqrt{xy})}{10(x + 2\sqrt{xy})} = \frac{1}{2}$
- k) $-(\sqrt{2a} \cdot 7\sqrt{3b}) \cdot (4\sqrt{2a} \cdot 3\sqrt{3b}) = -\frac{\sqrt{2a}}{7\sqrt{3b}} \cdot \frac{4\sqrt{2a}}{3\sqrt{3b}} = \frac{4 \cdot 2a}{7 \cdot 3 \cdot 3b} = \frac{8a}{63b}$
- l) $-\frac{\sqrt{2a}}{7\sqrt{3b}} \cdot \frac{4\sqrt{2a}}{3\sqrt{3b}} = \frac{4 \cdot 2a}{21 \cdot 3b} = \frac{8a}{63b}$

Lösung A2

- a) $3^3\sqrt{3} \cdot 7^3\sqrt{3} \cdot 4^3\sqrt{3} = 3 \cdot 7 \cdot 4 \cdot (\sqrt[3]{3})^3 = 84 \cdot 3 = 252$
- b) $11^4\sqrt[4]{5} \cdot 3^4\sqrt[4]{5} \cdot 6^4\sqrt[4]{5} = \frac{11 \cdot 3 \cdot 6 \cdot \sqrt[4]{5}^2}{6^4\sqrt[4]{5}} = \frac{11}{2} \cdot \sqrt[4]{5}$
- c) $6^n\sqrt[n]{b} \cdot 9^n\sqrt[n]{b} \cdot 20^n\sqrt[n]{b} = 6 \cdot 9 \cdot 20 \cdot (\sqrt[n]{b})^3 = 1080 \cdot \sqrt[n]{b^3}$
- d) $7^a\sqrt[a]{3b} \cdot 12^a\sqrt[a]{3b} \cdot 3^a\sqrt[a]{3b} = (7 \cdot 12 \cdot 3) \cdot (\sqrt[a]{3b} \cdot \sqrt[a]{3b} \cdot \sqrt[a]{3b}) = \frac{7}{36} \cdot \frac{1}{\sqrt[a]{3b}} = \frac{7}{36\sqrt[a]{3b}}$
- e) $5^3\sqrt[3]{12} \cdot 6^3\sqrt[3]{12} \cdot 12^3\sqrt[3]{12} + 4^5\sqrt[5]{7} \cdot 8^5\sqrt[5]{7} \cdot 4^5\sqrt[5]{7} = (5 \cdot 6 \cdot 12) \cdot (\sqrt[3]{12} \cdot \sqrt[3]{12} \cdot \sqrt[3]{12}) + (4 \cdot 8 \cdot 4) \cdot (\sqrt[5]{7} \cdot \sqrt[5]{7} \cdot \sqrt[5]{7}) = \frac{5}{2} \cdot \sqrt[3]{12^3} + \frac{1}{8} \cdot \frac{1}{\sqrt[5]{7}} = 30 + \frac{1}{8\sqrt[5]{7}}$
- f) $3^4\sqrt[4]{a} \cdot 2^5\sqrt[5]{b} \cdot 6^5\sqrt[5]{b} \cdot (8^4\sqrt[4]{a} \cdot 3^5\sqrt[5]{b} \cdot 7^4\sqrt[4]{a}) = \frac{3 \cdot 2 \cdot 6 \cdot 4 \cdot \sqrt[4]{a} \cdot \sqrt[5]{b}^2}{8 \cdot 3 \cdot 7 \cdot \sqrt[4]{a}^2 \cdot \sqrt[5]{b}} = \frac{3}{14} \cdot \frac{\sqrt[5]{b}}{\sqrt[4]{a}}$
- g) $\frac{4a^n\sqrt[n]{x} \cdot 9b^m\sqrt[m]{y} \cdot 3a^n\sqrt[n]{x}}{2b^m\sqrt[m]{y} \cdot 7a^n\sqrt[n]{x} \cdot 3b^m\sqrt[m]{y}} = \frac{4 \cdot 9 \cdot 3 \cdot a^2 \cdot b \cdot \sqrt[n]{x}^2 \cdot m\sqrt[m]{y}}{2 \cdot 7 \cdot 3 \cdot a \cdot b^2 \cdot \sqrt[n]{x} \cdot m\sqrt[m]{y}^2} = \frac{18}{7} \cdot \frac{a}{b} \cdot \frac{\sqrt[n]{x}}{m\sqrt[m]{y}} = \frac{18a\sqrt[n]{x}}{7b^m\sqrt[m]{y}}$
- h) $\frac{2x^a\sqrt[a]{3b} \cdot 14x^a\sqrt[a]{3b}}{6x^a\sqrt[a]{3b}} \cdot \frac{4y^c\sqrt[c]{5d}}{6y^c\sqrt[c]{5d} \cdot 5y^c\sqrt[c]{5d}} = \frac{14x^a\sqrt[a]{3b}}{3} \cdot \frac{2}{3y^c\sqrt[c]{5d}} = \frac{28x^a\sqrt[a]{3b}}{9y^c\sqrt[c]{5d}}$