



#### Lösung A1

$$a) 2x^{3(3-x)} = x^{(8-x)}\sqrt[3]{8}$$

$$c) 2^{\frac{x+2t}{t(x+t)}} = t^{(x+t)}\sqrt[2]{2x+2t}$$

$$e) e^{\frac{x^2+tx-1}{x}} = x\sqrt{e^{x^2+tx-1}}$$

$$g) e^{\frac{2ax-2x^3-1}{2x}} = 2x\sqrt{e^{2ax-2x^3-1}}$$

$$i) (x+1)^{\frac{2n}{n^2-1}} = n^{2-1}\sqrt{(x+1)^{2n}}$$

$$b) a^{\frac{x+1}{3(x-2)}} = \sqrt[3]{a^{x+1}}$$

$$d) 2^{\frac{x^2+x-1}{x}} = x\sqrt[2]{2^{x^2+x-1}}$$

$$f) 2^{\frac{2x+3}{x+2}} = \frac{1}{\sqrt[2]{2^{2x+3}}}$$

$$h) 3 \cdot a^{\frac{k^2+k-1}{k(k-1)}} = 3 \cdot a^{k(k-1)}\sqrt[3]{a^{k^2+k-1}}$$

#### Lösung A2

$$a) 6x^{\frac{5}{2}}a^{\frac{1}{2}} = 6\sqrt{ax^5}$$

$$c) 18x^{\frac{3}{2}} = 18x \cdot \sqrt{x}$$

$$e) 60x^2y^{\frac{3}{2}} = 60x^2y\sqrt{y}$$

$$g) 48a^{\frac{5}{2}}b^{\frac{11}{6}} = 48a^2b^{\frac{6}{5}}\sqrt[3]{a^3b^5}$$

$$i) 36a^2x^{\frac{1}{2}}b^{\frac{5}{6}} = 36a^2\sqrt{x} \cdot \sqrt[6]{b^5}$$

$$k) 30x^{\frac{11}{6}}y^{\frac{5}{6}} = 30x\sqrt[6]{(xy)^5}$$

$$m) 30a^{\frac{11}{6}}x^{\frac{7}{3}} = 30ax^2\sqrt[6]{a^5x^2}$$

$$b) 6a^{\frac{1}{2}}x^2y^{\frac{3}{2}} = 6x^2y\sqrt{ay}$$

$$d) 10a^{\frac{3}{2}}x^2y^{\frac{1}{2}} = 10ax^2\sqrt{ay}$$

$$f) 24a^{\frac{5}{2}}x^{\frac{3}{2}}y^{\frac{1}{2}} = 24a^2x\sqrt{axy}$$

$$h) 16a^{\frac{1}{2}}xy^{\frac{2}{3}} = 16x \cdot \sqrt{a} \cdot \sqrt[3]{y^2}$$

$$j) 48ab^{\frac{3}{2}}c^{\frac{3}{2}} = 48abc \cdot \sqrt{bc}$$

$$l) 24a^{\frac{4}{3}}xy^{\frac{1}{3}} = 24ax^3\sqrt{ay}$$

$$n) 40a^{\frac{5}{2}}x^{\frac{5}{6}}y^{\frac{7}{12}} = 40a^2\sqrt{a} \cdot \sqrt[6]{x^5} \cdot \sqrt[12]{y^7}$$

#### Lösung A3

$$a) \frac{x}{2a^{\frac{1}{2}}} = \frac{x}{2\sqrt{a}}$$

$$b) \frac{2a}{3x^{\frac{1}{6}}} = \frac{2a}{3\sqrt[6]{x}}$$

$$c) \frac{2}{3x^{\frac{1}{2}}y^{\frac{1}{2}}} = \frac{2}{3\sqrt{xy}}$$

$$d) \frac{3}{4x^{\frac{2}{3}}} = \frac{3}{4\sqrt[3]{x^2}}$$

$$e) \frac{4}{3a^{\frac{1}{6}}b^{\frac{2}{3}}} = \frac{4}{3\sqrt[6]{ab^2}}$$

$$f) \frac{2}{3x^{\frac{1}{2}}} = \frac{2}{3\sqrt{x}}$$

$$g) \frac{3}{5a^{\frac{1}{2}}x^{\frac{1}{6}}} = \frac{3}{5\sqrt{a}\sqrt[6]{x}}$$

$$h) \frac{3}{5a^{\frac{1}{2}}b^{\frac{2}{3}}} = \frac{3}{5\sqrt{ab^2}}$$

#### Lösung A4

$$a) 4a^{\frac{1}{3}}xb^{-1} = \frac{4x}{b}\sqrt[3]{a}$$

$$b) 4a^{\frac{1}{2}}yb^{-\frac{1}{3}} = 4y \cdot \frac{\sqrt{a}}{\sqrt[3]{b}}$$

$$c) 2y(ab)^{-\frac{1}{2}} = \frac{2y}{\sqrt{ab}}$$

$$d) 2a^{\frac{2}{3}}(bx)^{\frac{1}{2}} = 2\sqrt[3]{a^2}\sqrt{bx}$$

$$e) 15a^{\frac{1}{3}}b^{-\frac{1}{2}}xy^{-1} = \frac{15x\sqrt[3]{a}}{y\sqrt{b}}$$

$$f) 3a^{-\frac{2}{3}}x^{\frac{1}{2}}b^{-\frac{1}{2}} = \frac{3}{\sqrt[3]{a^2}} \cdot \sqrt{\frac{x}{b}}$$

$$g) 5a^{\frac{1}{2}}x^{-\frac{2}{3}} = \frac{5\sqrt{a}}{\sqrt[3]{x^2}}$$

$$h) 4a^{-\frac{1}{2}}b^{-\frac{1}{6}}c^{-1} = \frac{4}{\sqrt{a}\sqrt[6]{b}\cdot c}$$

#### Lösung A5

$$a) 35(ab)^{\frac{5}{6}} = 35\sqrt[6]{(ab)^5}$$

$$b) 72x^{\frac{3}{2}}y^{\frac{8}{15}} = 72x\sqrt{x} \cdot \sqrt[15]{y^8}$$

$$c) 32x^{\frac{5}{6}}y^{\frac{4}{3}}z^{\frac{3}{4}} = 32y\sqrt{x^5} \cdot \sqrt[3]{y} \cdot \sqrt[4]{z^3}$$

$$d) \frac{1}{2}a^{\frac{9}{14}}b^{\frac{5}{6}} = \frac{1}{2}\sqrt[14]{a^9} \cdot \sqrt[6]{b^5}$$

$$e) 0,6x^{\frac{11}{6}}y^{\frac{17}{10}}z^{\frac{7}{4}} = 0,6xyz\sqrt{x^5} \cdot \sqrt[10]{y^7} \cdot \sqrt[4]{z^3}$$

$$f) \frac{1}{5}a^{\frac{13}{12}}b^{\frac{7}{4}} = \frac{1}{5}ab^{12}\sqrt{a} \cdot \sqrt[4]{b^3}$$

$$g) 8x^{\frac{17}{10}}y^{\frac{11}{6}}z^{\frac{7}{6}} = 8xyz\sqrt[10]{x^7} \cdot \sqrt[6]{y^5z}$$



h)  $816u^{\frac{5}{3}}v^{\frac{11}{6}}w^{\frac{23}{14}} = 816uvw^3\sqrt{u^2} \cdot \sqrt[6]{v^5} \cdot \sqrt[14]{w^9}$

i)  $66a^{\frac{17}{10}}b^{\frac{43}{30}}c^{\frac{29}{24}} = 66abc^{10}\sqrt{a^7} \cdot \sqrt[30]{b^{13}} \cdot \sqrt[24]{c^5}$

j)  $480c^{\frac{2}{3}} \cdot (ab)^{\frac{8}{15}} = 480^3\sqrt{c^2} \cdot \sqrt[15]{(ab)^8}$

### Lösung A6

a)  $\frac{1}{2^{\frac{10}{3}}} = \frac{1}{8 \cdot \sqrt[3]{2}}$

b)  $\frac{1}{3^{\frac{2}{15}}} = \frac{1}{\sqrt[15]{9}}$

c)  $\frac{1}{5^{\frac{1}{12}}} = \frac{1}{\sqrt[12]{5}}$

d)  $\frac{1}{2^{\frac{1}{37}}} = \frac{1}{\sqrt[37]{2}}$

e)  $3^{\frac{2}{7}} = \sqrt[7]{9}$

f)  $\frac{1}{7^{\frac{1}{74}}} = \frac{1}{\sqrt[74]{7}}$

g)  $2^{\frac{39}{5}} = 2^7 \cdot \sqrt[5]{16}$

h)  $\frac{1}{3^{\frac{18}{5}}} = \frac{1}{27 \cdot \sqrt[5]{27}}$

i)  $\frac{1}{6^{\frac{12}{5}}} = \frac{1}{36 \cdot \sqrt[5]{36}}$

j)  $3^{\frac{-k}{(2k+1)(k+1)}} = \frac{1}{(2k+1)(k+1)\sqrt[3]{3^k}}$

k)  $7^{\frac{-3k+1}{5k(2k-1)}} = \frac{1}{5k(2k-1)\sqrt[7]{3^{3k+1}}}$

l)  $5^{\frac{-2}{9k^2-1}} = \frac{1}{9k^2-1\sqrt[5]{25}}$

m)  $5^{\frac{4-15k}{5k-1}} = 5^{k-1}\sqrt[5]{4-15k}$

n)  $3^{\frac{-5k+24}{k+5}} = \frac{1}{k+5\sqrt[3]{5^{5k+24}}}$

o)  $2^{\frac{1-36k}{6k}} = 6^k\sqrt[2]{1-36k}$

### Lösung A7

a)  $6^{-\frac{1}{3}} = \frac{1}{\sqrt[3]{6}}$

b)  $6^{\frac{2}{15}} = \sqrt[15]{36}$

c)  $6^{-\frac{22}{15}} = \frac{1}{6 \cdot \sqrt[15]{6^7}}$

d)  $6^{\frac{22}{15}} = 6 \cdot \sqrt[15]{6^7}$

e)  $6^{\frac{2}{15}} = \sqrt[15]{36}$

f)  $\frac{1}{6^{\frac{1}{35}}} = \frac{1}{3 \cdot \sqrt[5]{3}}$

g)  $5^{\frac{1}{5}} = \sqrt[5]{5}$

h)  $\frac{1}{4^{\frac{12}{7}}} = \frac{1}{4 \cdot \sqrt[7]{4^5}}$

i)  $-2$

j)  $\frac{1}{\frac{53}{2^{10}}} = \frac{1}{32 \cdot \sqrt[10]{8}}$

k)  $\frac{1}{3^{\frac{18}{5}}} = \frac{1}{27 \cdot \sqrt[5]{27}}$

l)  $5^{-2+3} = 5$

m)  $5^{\frac{11}{3}} = 125 \cdot \sqrt[3]{25}$

n)  $\frac{1}{5^{\frac{31}{7}}} = \frac{1}{25 \cdot \sqrt[7]{5}}$

o)  $a^{\frac{11}{15}} = \sqrt[15]{a^{11}}$

p)  $\frac{1}{\frac{31}{a^{15}}} = \frac{1}{a^2 \cdot \sqrt[15]{a}}$

q)  $a^{\frac{31}{15}} = a^2 \sqrt[15]{a}$

r)  $\frac{1}{\frac{11}{a^{15}}} = \frac{1}{\sqrt[15]{a^{11}}}$

s)  $\frac{1}{\frac{k+4}{3^{(2k+1)(k-3)}}} = \frac{1}{(2k+1)(k-3)\sqrt[3]{3^{k+4}}}$

t)  $5^{\frac{2+5k}{(2-3k)(4+2k)}} = \frac{1}{(2-3k)(4+2k)\sqrt[5]{2^{2+5k}}}$

u)  $\frac{1}{\frac{3k+1}{2^{(k+5)(4-2k)}}} = \frac{1}{(k+5)(4-2k)\sqrt[2]{2^{3k+1}}}$

v)  $\frac{1}{\frac{k}{a^6}} = \frac{1}{\sqrt[6]{a^k}}$

w)  $a^{-\frac{2}{9k^2-1}} = \frac{1}{9k^2-1\sqrt[9]{a^2}}$

x)  $a^{\frac{-3k-9}{(3k-1)(3k-5)}} = \frac{1}{(3k-1)(3k-5)\sqrt[3]{a^{3k+9}}}$

y)  $a^{\frac{-2k+35}{(2k-3)(5+2k)}} = \frac{1}{(2k-3)(5+2k)\sqrt[2]{a^{2k-35}}}$