

G 10 b Lösungen S. 123

21) a) $\frac{4\sqrt{5^3}}{4\sqrt{5}} = 5^{\frac{3}{4}} \cdot 5^{\frac{1}{4}} = 5^{\frac{3}{4} + \frac{1}{4}} = 5$

b) $\frac{5\sqrt{x^3}}{\sqrt{x}} = x^{\frac{3}{2}} \cdot x^{\frac{1}{2}} = x^{\frac{6}{2} + \frac{1}{2}} = x^{\frac{7}{2}} \quad (x \geq 0)$

c) $\frac{a^2}{\sqrt{a}} = a^2 : a^{\frac{1}{2}} = a^{2 - \frac{1}{2}} = a^{\frac{3}{2}} \quad (a > 0)$

d) $\frac{\sqrt[3]{x}}{\sqrt[3]{x^4}} = x^{\frac{1}{3}} : x^{\frac{4}{3}} = x^{\frac{1}{3} - \frac{4}{3}} = x^{-1} \quad (x > 0)$

e) $\frac{u^{-1}}{\sqrt{u^{-3}}} = u^{-1} : u^{-\frac{3}{2}} = u^{-1 - (-\frac{3}{2})} = u^{\frac{1}{2}} \quad (u > 0)$

22) a) $3x \cdot x^2 + 11x^3 \cdot x^5 = 3x^3 + 11x^8 = 14x^8$

b) $12x^9 - 8x^{-2} \cdot x^{11} = 12x^9 - 8x^9 = 4x^9$

c) $\frac{5a^8}{a^4} + \frac{4a}{2a^{-3}} = 5a^4 + 2a^4 = 7a^4$

23) a) $(x^4 + x^2) \cdot x^3 = x^7 + x^5$ b) $(a^2 - a + a^5) \cdot a^4 = a^6 - a^5 + a^9$

c) $(y^4 - 3y^{-3}) \cdot y^2 = y^6 - 3y^{-1}$

d) $(25 + 5^{-4} - 5^2) \cdot 5^{-3} = 25^{-2} + 5^{-7} - 5^{-1}$

e) $(5uv^2 - u^3v) \cdot u^2v^4 = 5u^3v^6 - u^5v^5$

f) $(u^{-1}v + 3u^2v^{-4}) \cdot 4u^2v^{-2} = 4uv^{-1} + 12u^4v^{-6}$