

5. Potenzen

$$34. a.) x^{2n+1+11-n} = \frac{x^{n+12}}{x}$$

$$b.) \sqrt{5} \cdot \sqrt{5^4} \cdot \sqrt{5^7} = \sqrt{5^{1+4+7}} = \sqrt{5^{12}} = (5^{\frac{12}{2}}) = \underline{\underline{5^6}}$$

$$c.) (-1)^{11+15+15} = (-1)^{39} = -1 \quad (39 \text{ ungerade})$$

$$d.) \left(\frac{2ab \cdot 3a^2bc^3}{3c \cdot 4b} \right)^3 = \left(\frac{a^3b}{2} \right)^3 = \underline{\underline{\frac{a^9b^3}{8}}}$$

$$35. a.) \left(\frac{2^2 \cdot 4abx}{2ax} \right)^n = (2b)^n = 2^n \cdot b^n$$

$$b.) 2^{16} - 16^2 = 2^{16} - (2^4)^2 = 2^{16} - 2^8$$

$$c.) a^1 + a^2 \quad (\text{Distributivgesetz})$$

$$d.) a^{2n - (2n+1)} = a^{-1} = \frac{1}{a}$$

$$36. a.) 3^8 = 3^n \Rightarrow n = 8$$

$$b.) 16 \cdot 2^7 = 2^x \Rightarrow 2^{11} = 2^x \Rightarrow x = 11$$

$$c.) 25 \cdot 5^{20} = 5^x \Rightarrow 5^{22} = 5^x \Rightarrow x = 22$$

$$d.) 2^a(16-8) = 2^x \\ 2^3 \cdot 2^a = 2^x \Rightarrow x = a+3$$

$$e.) 5^{12} : 5^{10} = 5^x \Rightarrow 5^2 = 5^x \Rightarrow x = 2$$

$$f.) (10^2)^{10'000} = 10^x \quad x = 20'000$$

$$37. a.) 512 = 2^9 \rightarrow x = -9$$

$$b.) 100^6 = 10^{12} \rightarrow x = -12$$

$$c.) -8 = (-2)^3 \quad x = -2$$

$$d.) x = \frac{1}{2} \quad 2^{-6} = \left(\frac{1}{2}\right)^6$$

$$e.) 0, 1, -1$$

$$f.) x^6 = 4^6 \quad \underline{x = 4}$$

$$g.) x = 5^3; 5^8 = \underline{5^{-5}}$$

$$h.) 2^{-x} = 2^6 : 2^{-12} = 2^{18} \quad \underline{x = -18}$$

$$i.) x = 0 \quad \underline{a^0 = 1} \quad (a \neq 0)$$

$$k.) 2^1 = 2 \Rightarrow 2^x = 1 \Rightarrow \underline{x = 0}$$

$$l.) 2^1 = 2 \Rightarrow x^2 = 1 \Rightarrow \underline{x = \pm 1}$$

$$m.) 2^{2x} = 2^{-4} \Rightarrow 2x = -4 \\ \underline{x = -2}$$