

Aufgabe 11.1

(a) $\frac{1}{x^{-4}} = x^4$

(b) $\frac{2}{p^{-2}} = 2p^2$

Aufgabe 11.2

(a) $\left(\frac{3}{x}\right)^{-3} = \left(\frac{x}{3}\right)^3 = \frac{x^3}{27}$

(b) $\left(\frac{1}{7a}\right)^{-2} = (7a)^2 = 49a^2$

Aufgabe 11.3

(a) $\left(\frac{0.01}{z}\right)^{-3} = \left(\frac{10^{-2}}{z}\right)^{-3} = \left(\frac{z}{10^{-2}}\right)^3 = \frac{z^3}{10^{-6}} = 10^6 z^3$

(b) $\left(\frac{c}{0.1}\right)^{-4} = \left(\frac{c}{10^{-1}}\right)^{-4} = \left(\frac{10^{-1}}{c}\right)^4 = \frac{10^{-4}}{c^4} = \frac{1}{10^4 c^4}$

Aufgabe 11.4

(a) $\left(\frac{\sqrt{2}}{2}\right)^{-4} = \left(\frac{2}{\sqrt{2}}\right)^4 = (\sqrt{2})^4 = 2^2 = 4$

(b) $\left(\frac{6}{\sqrt{3}}\right)^{-2} = \left(\frac{\sqrt{3}}{6}\right)^2 = \frac{3}{36} = \frac{1}{12}$

Aufgabe 11.5

(a) $0.000\,345 = 3.45 \cdot 10^{-4}$

(b) $0.000\,000516 = 5.16 \cdot 10^{-7}$

Aufgabe 11.6

(a) $176.2 \cdot 10^{-12} = 1.762 \cdot 10^{10}$

(b) $0.0094 \cdot 10^{-34} = 9.4 \cdot 10^{-37}$

Aufgabe 11.7

$$a = 4^{-2} = \frac{1}{4^2} = \frac{1}{16}$$

$$b = 6^{-2} = \frac{1}{6^2} = \frac{1}{36}$$

$$c = 3^{-5} = \frac{1}{3^5} = \frac{1}{243}$$

$$d = 5^{-3} = \frac{1}{5^3} = \frac{1}{125}$$

$$e = 2^{-4} = \frac{1}{2^4} = \frac{1}{16}$$

$$f = 6^{-3} = \frac{1}{6^3} = \frac{1}{216}$$

$$\Rightarrow c < f < d < b < a = e$$

Aufgabe 11.8

$$a = 20^{-1} = \frac{1}{20}$$

$$b = 0.125^{-2} = \left(\frac{1}{8}\right)^{-2} = 8^2 = 64$$

$$c = 7^{-3} = \frac{1}{7^3} = \frac{1}{343}$$

$$d = -2^{-9} = -\frac{1}{2^9} = -\frac{1}{512}$$

$$e = 11^0 = 1$$

$$f = 0.1^{-2} = \left(\frac{1}{10}\right)^{-2} = 10^2 = 100$$

$$\Rightarrow d < c < a < e < b < f$$