Potenzgesetze – Kurzübersicht

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$$a^1 = a \qquad a^0 = 1 \qquad 0^n = 0 \qquad 1^n = 1$$

$$a^b = \frac{1}{a^{-b}} \qquad a^{-b} = \frac{1}{a^b} \qquad a^{-1} = \frac{1}{a} \qquad a = \frac{1}{a^{-1}}$$

$$a^b = e^{b\ln(a)}$$

$$\sqrt[n]{a} = a^{\frac{1}{n}} = a^{n^{-1}} \qquad \frac{1}{\sqrt[n]{a}} = a^{-\frac{1}{n}} = a^{-n^{-1}}$$

$$xa^b \pm ya^b = [x \pm y]\, a^b$$

$$a^b a^c = a^{b+c} \qquad \frac{a^b}{a^c} = a^b a^{-c} = a^{b-c}$$

$$a^x b^x = (ab)^x \qquad \frac{a^x}{b^x} = a^x b^{-x} = \left(ab^{-1}\right)^x$$

$$\left(a^b\right)^c = a^{bc}$$

$$\sqrt[n]{a}\sqrt[n]{b} = \sqrt[n]{ab} = a^{n^{-1}} b^{n^{-1}} = (ab)^{n^{-1}} \qquad \frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}} = \frac{a^{n^{-1}}}{b^{n^{-1}}} = \left[\frac{a}{b}\right]^{n^{-1}} = \left[ab^{-1}\right]^{n^{-1}}$$

$$\sqrt[n]{a}\sqrt[m]{a} = \sqrt[mn]{a^m}\sqrt[mn]{a^n} = \sqrt[mn]{a^{m+n}} = a^{\frac{m+n}{mn}} \qquad \frac{\sqrt[n]{a}}{\sqrt[m]{a}} = \frac{\sqrt[nm]{a^m}}{\sqrt[nm]{a^n}} = \sqrt[nm]{a^{m-n}} = \left[a^{m-n}\right]^{(nm)^{-1}}$$

$$\left[\sqrt[m]{a}\right]^n = \sqrt[m]{a^n} = \left[a^{m^{-1}}\right]^n = \left[a^n\right]^{m^{-1}} \qquad \sqrt[m]{\sqrt[n]{a}} = \sqrt[mn]{a} = \left(a^{n^{-1}}\right)^{m^{-1}} = a^{(nm)^{-1}}$$

$$a^{\frac{m}{n}} a^{\frac{p}{q}} = a^{\frac{mq+np}{nq}} \qquad a^{\frac{m}{n}} \left[a^{\frac{p}{q}}\right]^{-1} = a^{\frac{mq-np}{nq}}$$

$$a^{\frac{m}{n}} b^{\frac{m}{n}} = (ab)^{\frac{m}{n}} = (ab)^{mn^{-1}} \qquad a^{\frac{m}{n}} \left[b^{\frac{m}{n}}\right]^{-1} = \left(ab^{-1}\right)^{\frac{m}{n}} = \left(ab^{-1}\right)^{mn^{-1}}$$

$$\left[a^{\frac{m}{n}}\right]^{\frac{p}{q}} = a^{\frac{mp}{nq}} = a^{mp(nq)^{-1}}$$