Grundlagen Algebra

$$2^3 = 8$$

Exponent

$$3^{\swarrow} \quad 2^3 = x$$

↑ Basis

$$a^n = \underbrace{a \cdot a \cdot a \cdot \ldots a}_{n\text{-mal}}$$

$$3^4 \cdot 3^2 = 3^{4+2} = 3^6$$

$$a^m \cdot a^n = a^{m+n}$$

$$(3^4)^2 = 3^{4 \cdot 2} = 3^8$$

$$(a^m)^n = a^{m \cdot n}$$

$$x^3 = 8$$

$$\Downarrow$$

$$x = \sqrt[3]{8}$$

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

$$\sqrt[4]{2^8} = 2^{\frac{8}{4}} = 2^2 = 8$$

$$\sqrt[n]{a^m} = a^{\frac{m}{n}}$$

$$2^x = 8$$

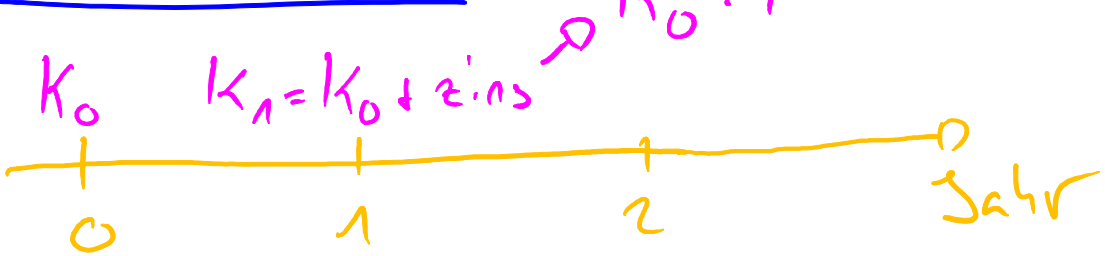
$$\Downarrow$$

$$x = \log_2(8)$$

$$\log_a(u \cdot v) = \log_a u + \log_a v$$

$$\log_a(u^v) = v \cdot \log_a(u)$$

Zinseszins



$$K_1 = K_0 + K_0 \cdot i = K_0(1+i)$$

$$= 100 + 100 \cdot 0.02 = 100 \cdot 1.02$$

$\Downarrow$

2 %

$$K_2 = K_1 + Zins$$

$$\hat{=} K_1 \cdot i$$

$$K_2 - K_1(1 \cdot i) = K_0(1+i)^2$$

$$K_n = K_0(1+i)^n$$

① $K_0, i, n \Rightarrow K_n = K_0 (1+i)^n \Rightarrow K_n = K_0 \cdot q^n$

Bsp.: $K_0 = 1000$, $n = 18$, $i = 0.03$ $\Rightarrow K_{18} = 1000 \cdot 1.03^{18} = 1702,43$

Aufzinsen

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② $K_n, i, n \Rightarrow K_0 = \frac{K_n}{(1+i)^n} = \frac{K_n}{q^n}$

Bsp.: $K_n = 2000$, $n = 18$, $i = 0.04$ $\Rightarrow \frac{2000}{1.04^{18}} = 987,25 = K_0$

Abzinsen (Diskontieren)

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③ $K_0, K_n, n \Rightarrow q$

$K_n = K_0 \cdot q \quad | : K_0$

$\frac{K_n}{K_0} = q^n \Rightarrow q = \sqrt[n]{\frac{K_n}{K_0}} = \left(\frac{K_n}{K_0}\right)^{\frac{1}{n}}$

Bsp.: $K_0 = 800$, $K_{18} = 2000$, $n = 18$ $\Rightarrow q = \sqrt[18]{\frac{2000}{800}} = 1.052$

$i = 0.052 \approx 5.2\%$

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(4) $K_0, K_n, i \Rightarrow n = \log_q\left(\frac{K_n}{K_0}\right)$

Bsp.: $K_0 = 1000$, $K_n = 2000$, $i = 0.02$ $\Big\}$ $\log_{1.02}\left(\frac{2000}{1000}\right) = 35,00$

Signa Σ

$$\sum_{k=1}^{n} a_k = a_1 + a_2 + a_3 + \ldots + a_n$$