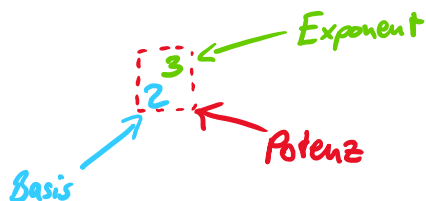


Übersicht Potenzen

Freitag, 2. September 2022

15:51

Was sind Potenzen?



Bsp. $x \cdot x \cdot x = x^3$

$$a \cdot a = a^2$$

$$4 \cdot 4 = 4^2 = 16$$

$$4^0 = 10^0 = 128^0 = 1$$

$$\sqrt{16} = 16^{\frac{1}{2}}$$

Potenzgesetze:

Bsp.: $2^{x-2} = 2^x \cdot 2^{-2}$

$$x^a \cdot x^b = x^{a+b}$$

$$2^5 \cdot 2^3 = 2^{5+3} = 2^8$$

$$x^a : x^b = \frac{x^a}{x^b} = x^{a-b}$$

$$2^5 : 2^3 = \frac{2^5}{2^3} = 2^{5-3} = 2^2$$

$$a^n \cdot b^n = (a \cdot b)^n$$

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

$$a^n : b^n = \frac{a^n}{b^n} = (a : b)^n$$

$$4^3 : 2^3 = \frac{4^3}{2^3} = (4 : 2)^3 = 2^3$$

$$(x^a)^b = x^{a \cdot b}$$

$$(2^5)^3 = 2^{5 \cdot 3} = 2^{15}$$

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

$$\sqrt[2]{16} = 16^{\frac{1}{2}}$$

negative Basis:

Bsp.:

$$-x^a \neq (-x)^a$$

$$(-5)^2 = (-5) \cdot (-5) = +25$$

$$-5^2 = -(5^2) = -(5 \cdot 5) = -25$$

$$(-5)^3 = (-5) \cdot (-5) \cdot (-5) = 25 \cdot (-5) = -125$$

→ ungerader Exponent: negatives Vorzeichen

→ gerader Exponent: positives Vorzeichen

negativer Exponent:

Bsp.

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

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

Basis & Exponent negativ:

Bsp.:

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

$$-5^{-2} = -\frac{1}{5^2} = -\frac{1}{5 \cdot 5} = -\frac{1}{25}$$

Vorzeichen nicht mit in den Bruch nehmen!