

Beispiel-Abfrage: Potenz-Rechengesetze

Vereinfache / multipliziere aus / faktorisiere, falls möglich:

$x^7 + y^7 = \underline{\hspace{2cm}}$

$x^7 + x^7 = \underline{\hspace{2cm}}$

$x^7 - x^{-7} = \underline{\hspace{2cm}}$

$x^2 - y^2 = \underline{\hspace{2cm}}$

$x^5 - x^4 = \underline{\hspace{2cm}}$

$x^a + x^a = \underline{\hspace{2cm}}$

$y^b - y^b = \underline{\hspace{2cm}}$

$3^x + 6^x = \underline{\hspace{2cm}}$

$x^5 \cdot y^3 = \underline{\hspace{2cm}}$

$x^4 \cdot x^7 = \underline{\hspace{2cm}}$

$x^{11} \cdot y^{11} = \underline{\hspace{2cm}}$

$5^x \cdot 6^x = \underline{\hspace{2cm}}$

$7^x : 2^y = \underline{\hspace{2cm}}$

$24^3 : 12^2 = \underline{\hspace{2cm}}$

$x^5 : x^8 = \underline{\hspace{2cm}}$

$x^a : x^a = \underline{\hspace{2cm}}$

$\frac{6^x}{3^x} = \underline{\hspace{2cm}}$

$\frac{x^{-4}}{x^{-6}} = \underline{\hspace{2cm}}$

$\frac{x^2}{2^x} = \underline{\hspace{2cm}}$

$\frac{x^8 y^3}{x^3 y^8} = \underline{\hspace{2cm}}$

$(x^4)^3 = \underline{\hspace{2cm}}$

$(5^x)^2 = \underline{\hspace{2cm}}$

$(5^{-3})^{-2} = \underline{\hspace{2cm}}$

$\left(\frac{1}{3}\right)^{-3} = \underline{\hspace{2cm}}$

$\sqrt[3]{x^6} = \underline{\hspace{2cm}}$

$\sqrt[3x]{27^{-x}} = \underline{\hspace{2cm}}$

$x^{\frac{1}{2}} = \underline{\hspace{2cm}}$

$(x + y)^2 = \underline{\hspace{2cm}}$

$(x - y)^2 = \underline{\hspace{2cm}}$

$x^2 + y^2 = \underline{\hspace{2cm}}$

$x^2 - 2xy - y^2 = \underline{\hspace{2cm}}$

$(x + y)^3 = \underline{\hspace{2cm}}$

$(x + y)^4 = \underline{\hspace{2cm}}$

$(x^2 - y^2)^2 = \underline{\hspace{2cm}}$

$x^4 - y^4 = \underline{\hspace{2cm}}$

$\left(\frac{1}{9}\right)^{-\frac{1}{2}} = \underline{\hspace{2cm}}$

$(-x)^2 = \underline{\hspace{2cm}}$

$\left(\frac{1}{2}x\right)^2 = \underline{\hspace{2cm}}$

$\left(\frac{1}{2}x\right)^{-2} = \underline{\hspace{2cm}}$

$\left(-\frac{1}{2}x\right)^{-2} = \underline{\hspace{2cm}}$

$\sqrt[4]{x^6} = \underline{\hspace{2cm}}$

$(4x)^{\frac{1}{2}} = \underline{\hspace{2cm}}$

$\left(\frac{1}{4}x\right)^{\frac{1}{2}} = \underline{\hspace{2cm}}$

$(4x)^{-\frac{1}{2}} = \underline{\hspace{2cm}}$

$4x^{\frac{1}{2}} = \underline{\hspace{2cm}}$

$-x^{\frac{1}{2}} = \underline{\hspace{2cm}}$

$-4x^{\frac{1}{2}} = \underline{\hspace{2cm}}$

$-(x^2)^{-\frac{1}{2}} = \underline{\hspace{2cm}}$

$(-x^2)^{\frac{1}{2}} = \underline{\hspace{2cm}}$

$(-x^3)^{\frac{1}{3}} = \underline{\hspace{2cm}}$

Lösung: Potenz-Rechengesetze

$$x^7 + y^7 = \text{geht nicht einfacher}$$

$$x^7 + x^7 = 2x^7$$

$$x^7 - x^{-7} = \text{geht nicht einfacher}$$

$$x^2 - y^2 = (x + y)(x - y)$$

$$x^5 - x^4 = x^4 \cdot (x - 1)$$

$$x^a + x^a = 2x^a$$

$$y^b - y^b = 0$$

$$3^x + 6^x = 3^x \cdot (1 + 2^x)$$

$$x^5 \cdot y^3 = \text{geht nicht einfacher}$$

$$x^4 \cdot x^7 = x^{11}$$

$$x^{11} \cdot y^{11} = (xy)^{11}$$

$$5^x \cdot 6^x = 30^x$$

$$7^x : 2^y = \text{geht nicht einfacher}$$

$$24^3 : 12^2 = \frac{2^3 \cdot 12^3}{12^2} = 2^3 \cdot 12 = 96$$

$$x^5 : x^8 = x^{5-8} = x^{-3}$$

$$x^a : x^a = 1$$

$$\frac{6^x}{3^x} = \left(\frac{6}{3}\right)^x = 2^x$$

$$\frac{x^{-4}}{x^{-6}} = x^{-4-(-6)} = x^2$$

$$\frac{x^2}{2^x} = \text{geht nicht einfacher}$$

$$\frac{x^8 y^3}{x^3 y^8} = x^5 y^{-5} = \frac{x^5}{y^5} = \left(\frac{x}{y}\right)^5$$

$$(x^4)^3 = x^{4 \cdot 3} = x^{12}$$

$$(5^x)^2 = 5^{x \cdot 2} = 5^{2x} = (5^2)^x = 25^x$$

$$(5^{-3})^{-2} = 5^{-3 \cdot (-2)} = 5^6$$

$$\left(\frac{1}{3}\right)^{-3} = 3^3 = 27$$

$$\sqrt[3]{x^6} = x^{\frac{6}{3}} = x^2$$

$$\sqrt[3]{27^{-x}} = 27^{\frac{-x}{3x}} = 27^{\frac{1}{3}} = \sqrt[3]{27} = 3 \quad x^{\frac{1}{2}} = \sqrt{x}$$

$$(x + y)^2 = x^2 + 2xy + y^2$$

$$(x - y)^2 = x^2 - 2xy + y^2$$

$$x^2 + y^2 = \text{geht nicht einfacher}$$

$$x^2 - 2xy - y^2 = \text{geht nicht einfacher}$$

$$(x + y)^3 = (x + y)^2(x + y) = \dots = x^3 + 3x^2y + 3xy^2 + y^3$$

$$(x + y)^4 = (x + y)^3(x + y) = \dots = x^4 + 4x^3y + 6x^2y^2 + 4xy^3 + y^4$$

$$(x^2 - y^2)^2 = x^4 - 2x^2y^2 + y^4$$

$$x^4 - y^4 = (x^2 + y^2)(x^2 - y^2) = (x^2 + y^2)(x + y)(x - y)$$

$$\left(\frac{1}{9}\right)^{-\frac{1}{2}} = 9^{\frac{1}{2}} = \sqrt{9} = 3$$

$$(-x)^2 = x^2$$

$$\left(\frac{1}{2}x\right)^2 = \frac{1}{4}x^2$$

$$\left(\frac{1}{2}x\right)^{-2} = \left(\frac{2}{x}\right)^2 = \frac{4}{x^2}$$

$$\left(-\frac{1}{2}x\right)^{-2} = \left(-\frac{2}{x}\right)^2 = \frac{4}{x^2}$$

$$\sqrt[4]{x^6} = x^{\frac{6}{4}} = x^{\frac{3}{2}} = \sqrt{x^3}$$

$$(4x)^{\frac{1}{2}} = 2\sqrt{x}$$

$$\left(\frac{1}{4}x\right)^{\frac{1}{2}} = \frac{1}{2}\sqrt{x}$$

$$(4x)^{-\frac{1}{2}} = \frac{1}{2\sqrt{x}}$$

$$4x^{\frac{1}{2}} = 4\sqrt{x}$$

$$-x^{\frac{1}{2}} = -\sqrt{x}$$

$$-4x^{\frac{1}{2}} = -4\sqrt{x}$$

$$-(x^2)^{-\frac{1}{2}} = -\frac{1}{\sqrt{x}}$$

$$(-x^2)^{\frac{1}{2}} = \sqrt{-x^2} = \text{geht nicht!}$$

$$(-x^3)^{\frac{1}{3}} = \sqrt[3]{-x^3} = -\sqrt[3]{x^3} = -x$$