

BM 1 1A, 18.12.2015

1. a) 0.0001
b) -1000
c) $(-10)^{-2} = \frac{1}{(-10)^2} = \frac{1}{100} = 0.01$
d) $-10^{-2} = - (10^{-2}) = -\frac{1}{10^2} = -0.01$

Potenz bindet stärker
als Vorzeichen!

2. a) $(10^4)^{-1} = 10^{-4} = 0.0001$
b) $(10^{-1})^{-1} = 10^{(-1) \cdot (-1)} = 10^1 = 10$
c) $\frac{1}{10^{-3}} = 10^3 = 1000$
d) $(-10)^{-6} = \frac{1}{(-10)^6} = \frac{1}{10^6} = 0.000'001$

3. a) $\frac{10^{-6}}{1}$
b) $\frac{1}{0.01^2} = \frac{1}{(10^{-2})^2} = \frac{1}{10^{-4}} = \underline{\underline{10^4}} = 10'000$
c) $\frac{1}{(-100)^3} = (-100)^3 = (-10^2)^3 = \underline{\underline{-10^6}} = -1'000'000$
d) $(1000^{-1})^2 = 1000^{-2} = (10^3)^{-2} = \underline{\underline{10^{-6}}}$

4. a) $\left(\frac{1}{2^{-2}}\right)^{-1} = \frac{1^{-1}}{(2^{-2})^{-1}} = 0.000'001$
 $= \frac{1}{2^2} = \frac{1}{4} = 0.25$

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

$$5. \quad a) \quad \frac{a^2 d^{-3}}{c^{-4} d^2} = a^2 d^{-3} c^4 d^{-2} = \underline{\underline{a^2 c^4 d^{-5}}}$$

$$b) \quad \frac{a^2}{a^{-3}} = a^2 \cdot a^3 = \underline{\underline{a^5}}$$

$$c) \quad \left(\frac{a^{-1}}{b^{-1}} \right)^{-1} = \frac{(a^{-1})^{-1}}{(b^{-1})^{-1}} = \frac{a}{b} = \underline{\underline{ab^{-1}}}$$

$$d) \quad \left(\frac{xy^{-1}}{x^{-1}y} \right)^{-2} = \frac{(xy^{-1})^{-2}}{(x^{-1}y)^{-2}} = \frac{x^{-2}y^2}{x^2y^{-2}}$$

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

$$6. \quad a) \quad 2^{n-1} - 2^n + 2^{n+1} \\ = 2^{-1}2^n - 2^n + 2^1 2^n \\ = 2^n(2^{-1} - 1 + 2) \\ = 2^n \left(\frac{1}{2} - 1 + 2 \right) = \underline{\underline{\frac{3}{2} \cdot 2^n}}$$

$$b) \quad 3^{-2x} + 9^{-x} \\ = 3^{-2x} + (3^2)^{-x} \\ = 3^{-2x} + 3^{-2x} = \underline{\underline{2 \cdot 3^{-2x}}}$$