

Die Potenzgesetze

Notiere die Terme in möglichst einfacher Potenzform. Zwischenschritte sind nie verboten.

a) $x^2 \cdot x^4 = x^{2+4} = x^6$ **Regel 1**

b) $x^4 \cdot x^8 = x^{4+8} = x^{12}$ **R 1**

c) $x^2 \cdot x^5 = x^{2+5} = x^7$ **R 1**

d) $x^y \cdot x^3 = x^{y+3}$ **R 1**

e) $x^{-2} \cdot x^4 = x^{-2+4} = x^2$ **R 1**

f) $2^x \cdot 2^y = 2^{x+y}$ **R 1**

g) $4^x : 4^y = 4^{x-y}$ **R 2**

h) $x^5 : x^4 = x^{5-4} = x^1 = x$ **R 2**

i) $y^2 \cdot x^2 = (xy)^2$ **R 3**

j) $3^x \cdot 2^x = (3 \cdot 2)^x = 6^x$ **R 3**

k) $(x^2)^3 = x^{2 \cdot 3} = x^6$ **R 5**

l) $(2^x)^3 = 2^{x \cdot 3} = 2^{3x}$ **R 5**

m) $(x^6)^3 = x^{6 \cdot 3} = x^{18}$ **R 5**

n) $1234^0 = 1$ **Definition**

o) $(x^2 \cdot x^3)^3 = x^{(2+3) \cdot 3} = x^{5 \cdot 3} = x^{15}$ **R 1, 5**

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|----|-----------------------------------|---|---|-------------------------------|
| 1 | $4^{x-4} \cdot 4^{x-2}$ | = | $4^{x-4+(x-2)} = 4^{2x-6}$ | R 1 |
| 2 | $(-2)^{-5} : (-2)^3 \cdot (-2)^1$ | = | $(-2)^{-5-3+1} = (-2)^{-7}$ | R 1, 2 |
| 3 | $g^5 + 8g^2$ | = | $g^2(g^3 + 8)$ | Addition! Ausklammern! |
| 4 | $c^{-1} \cdot c^{-8}$ | = | $c^{-1+(-8)} = c^{-1-8} = c^{-9}$ | R 1 |
| 5 | $(-9)^{-3} \cdot (-9)^{-5}$ | = | $(-9)^{-3+(-5)} = (-9)^{-3-5} = (-9)^{-8}$ | R 1 |
| 6 | $(-9)^{-3} : (-9)^{-5}$ | = | $(-9)^{-3-(-5)} = (-9)^{-3+5} = (-9)^2$ | R 2 |
| 7 | $(-7)^0 : (-7)^{-6}$ | = | $(-7)^{0-(-6)} = (-7)^6$ | R 2 |
| 8 | $(-3)^{-4} : (-3)^{-5}$ | = | $(-3)^{-4-(-5)} = (-3)^{-4+5} = (-3)^1 = (-3)$ | R 2 |
| 9 | $35d^7 : (5d^{-2})$ | = | $7d^{7-(-2)} = 7d^9$ | R 2 |
| 10 | $(5n)^2 \cdot 4n^{-5}$ | = | $5^2 n^2 \cdot 4 n^{-5} = 25 \cdot 4 n^{2+(-5)} = 100 n^{2-5} = 100 n^{-3}$ | R 1, 5 |
| 11 | $4^{-3z} : 4^{4z}$ | = | $4^{-3z-4z} = 4^{-7z}$ | R 2 |
| 12 | $3^{-3m} \cdot 3^{-5m}$ | = | $3^{-3m+(-5m)} = 3^{-3m-5m} = 3^{-8m}$ | R 1 |
| 13 | $p^5 : p^7$ | = | $p^{5-7} = p^{-2}$ | R 2 |
| 14 | $17^{-5r} \cdot 17^{3r}$ | = | $17^{-5r+3r} = 17^{-2r}$ | R 1 |
| 15 | $8a^{-2} : (4a^{-4})$ | = | $8 : 4 \cdot a^{-2-(-4)} = 2 a^{-2+4} = 2 a^2$ | R 2 |