

**Übungen:**

1)  $\frac{1}{a} + \frac{2}{3a^2}$

2)  $\frac{x}{a^2b} - \frac{1}{ab^3}$

3)  $\frac{ax^2}{b^3y} : \frac{a^2x}{y^2b}$

4)  $\frac{(x-a)z^2}{b(x-a)^2} : \frac{z}{ab(x-a)}$

5)  $\frac{a}{x} - \frac{b-2x-x^2}{x}$

6)  $\frac{2bc}{x^4y^5} : \frac{2c^2}{x^6y^3}$

7)  $(10^a)^{\frac{1}{a}}$

8)  $(5^x)^{2b} \cdot 5^{-bx}$

9)  $\left(\frac{7^{3x}}{7^{2x}}\right)^{ab}$

10)  $(ab^x + 3ab^x)^2$

11)  $\left(\frac{12a^n b^{2n}}{4b}\right)^{\frac{1}{n}}$

12)  $\left(m\frac{a^3}{a^x} + na^{2-x}a\right)^5$

13)  $\frac{1}{a^{-x}}$

14)  $\frac{2^x}{3^{-x}}$

15)  $\frac{(2a)^n}{a^n}$

16)  $\left(\frac{(xy)^n y^m x^{-n}}{y^{n-2}}\right)^3$

17)  $\left((10^a)^x\right)^{\frac{1}{a}}$

18)  $\left(\frac{ax}{2}\right)^3 \cdot \left(\frac{4}{x^2}\right)^2$

19)  $\frac{3x \cdot 7^{a+2} - 2x \cdot 7^{a+2}}{7^a}$

20)  $\left(\frac{10^{3a+b}}{10^{2a+b}}\right)^7$

□

Lösungen zum Potenzübungsblatt

(7)

$$1) = \frac{3a}{3a^2} + \frac{2}{3a^2} = \frac{3a+2}{3a^2}$$

$$2) = \frac{x^2 b^2}{a^2 b^3} - \frac{a}{a^2 b^3} = \frac{x^2 b^2 - a}{a^2 b^3}$$

$$3) = \frac{ax^2}{b^3 y} \cdot \frac{y^2 b}{a^2 x} = \frac{xy}{ab^2}$$

$$4) = \frac{(x-a)z^2}{b(x-a)^2} \cdot \frac{ab(x-a)}{z} = \frac{(x-a)^2 z^2 ab}{b(x-a)^2 z} = az$$

$$5) = \frac{a - (b - 2x \cdot x^2)}{x} = \frac{a - b + 2x + x^2}{x}$$

$$6) = \frac{2bc}{x^4 y^5} \cdot \frac{x^8 y^3}{2c^2} = \frac{bx^2}{y^2 c}$$

$$7) = 10^{a \cdot \frac{1}{a}} = 10^1 = 10$$

$$8) = 5^{x \cdot 2b} \cdot 5^{-bx} = 5^{2bx - bx} = 5^{bx}$$

$$9) = (7^{3x-2x})^{ab} = (7^x)^{ab} = 7^{abx}$$

$$10) = (4ab^x)^2 = 4^2 a^2 (b^x)^2 = 16a^2 b^{2x}$$

$$11) = \left( \frac{3a^4 b^{2n}}{b^4} \right)^{1/4} = (3a^4 b^{2n-4})^{1/4} = (3a^4 b^4)^{1/4} = (3(ab)^4)^{1/4} = 3^{1/4} ab$$

$$12) = (ma^{3-x} + na^{2-x+1})^5 = (ma^{3-x} + na^{3-x})^5 = 3^{1/4} ab$$

$$= ((m+n)a^{3-x})^5 = (m+n)^5 (a^{3-x})^5 = (m+n)^5 a^{5(3-x)}$$

$$13) = \frac{a^0}{a^{-x}} = a^{0-(-x)} = a^x$$

$$14) = 2^x \cdot 3^x = (2 \cdot 3)^x = 6^x$$

$$15) = \left( \frac{2a}{a} \right)^n = 2^n$$

$$16) = \left( \frac{x^n y^n y^m x^{-n}}{y^{n-2}} \right)^3 = \left( \frac{x^n x^{-n} y^n y^m}{y^{n-2}} \right)^3 \quad (2)$$

$$= \left( \frac{x^{n-n} y^{n+m}}{y^{n-2}} \right)^3 = \left( x^0 y^{n+m-(n-2)} \right)^3$$

$$= \left( y^{n+m-n+2} \right)^3 = \left( y^{m+2} \right)^3 = y^{3(m+2)}$$

$$17) = \left( 10^{ax} \right)^{\frac{1}{a}} = 10^{\frac{ax}{a}} = 10^x$$

$$18) = \frac{(ax)^3}{2^3} \cdot \frac{4^2}{(x^2)^2} = \frac{a^3 x^3}{8} \cdot \frac{16}{x^4} = \frac{2a^3}{x}$$

$$19) = \frac{(3x-2x) \cdot 7^{a+2}}{7^a} = x \cdot 7^{a+2-a} = x \cdot 7^2 = 49x$$

$$20) = \left( 10^{3a+b-(2a+b)} \right)^7 = \left( 10^{3a+b-2a-b} \right)^7 = \left( 10^a \right)^7 = 10^{7a}$$

### Endergebnisse:

$$1) \frac{3a+2}{3a^2}$$

$$2) \frac{xb^2 - a}{a^2 b^3}$$

$$3) \frac{xy}{ab^2}$$

$$4) az$$

$$5) \frac{a-b+2x+x^2}{x}$$

$$6) \frac{bx^2}{y^2c}$$

$$7) 10$$

$$8) 5^6 x$$

$$9) 7^{abx}$$

$$10) 16a^2 b^{2x}$$

$$11) 3^{\frac{1}{n}} ab$$

$$12) (m+n)^5 a^{5(3-x)}$$

$$13) a^x$$

$$14) 6^x$$

$$15) 2^n$$

$$16) y^{3(m+2)}$$

$$17) 10^x$$

$$18) \frac{2a^3}{x}$$

$$19) 49x$$

$$20) 10^{7a}$$