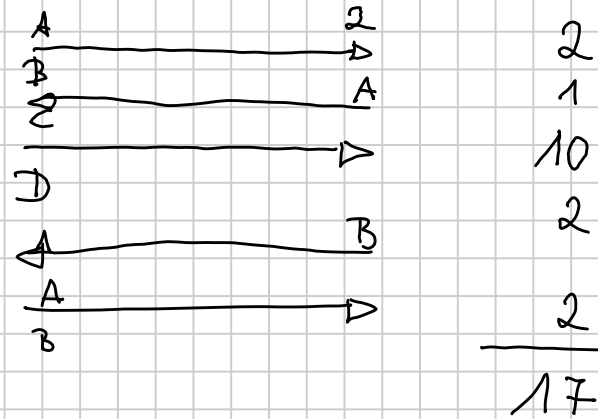


Potenzen und Terme

Denksport

- Ⓐ 1 min
 - Ⓑ 2 min
 - Ⓒ 5 min
 - Ⓓ 10 min
- } 17 min



Wiederholung

S. 1/22

3.7. $5\frac{3}{8} - 4\frac{5}{6} + 1\frac{2}{3} \cdot (2\frac{1}{4} - 1\frac{3}{8}) =$

$$= 5\frac{9}{24} - 4\frac{20}{24} + 1\frac{2}{3} \cdot (2\frac{2}{8} - 1\frac{3}{8}) =$$

$$= 4\frac{33}{24} - 4\frac{20}{24} + \frac{5}{3} \cdot (1\frac{10}{8} - 1\frac{3}{8}) =$$

$$= \dots \frac{13}{24} + \frac{5}{3} \cdot \frac{7}{8} =$$

$$= \frac{13}{24} + \frac{35}{24} = \frac{48}{24} = \underline{\underline{2}}$$

3.17 $3\frac{1}{4} - (2\frac{1}{2} - \frac{4}{5}) \cdot (-\frac{2}{3}) + (\frac{1}{2} + 4\frac{3}{5}) : \frac{1}{10} + (\frac{1}{8} - 2) =$

$$= 3\frac{1}{4} - (\frac{15}{10} - \frac{8}{10}) \cdot (-\frac{2}{3}) + (\frac{5}{10} + 4\frac{6}{10}) : \frac{1}{10} + (\frac{1}{8} - \frac{16}{8}) =$$

$$= 3\frac{1}{4} - (\frac{7}{10}) \cdot (-\frac{2}{3}) + \frac{4\frac{11}{10}}{1} \cdot \frac{10}{1} + (-\frac{15}{8}) =$$

$$= 3\frac{1}{4} - (-\frac{17}{15}) + \frac{51}{1} - \frac{15}{8} =$$

$$= 3\frac{30}{120} + \frac{136}{120} + 51 - \frac{225}{120} =$$

$$= 53\frac{61}{120}$$

Potenzen

$$3+3+3+3 = 4 \cdot 3$$

$$3 \cdot 3 \cdot 3 \cdot 3 = 3^4$$

Hochzahl
Exponent



Potenz

Basis

$$(-4) \cdot (-4) \cdot (-4) = (-4)^3 = -64$$

$$-5^4 \neq (-5)^4$$

$$-5 \cdot 5 \cdot 5 \cdot 5 \neq (-5) \cdot (-5) \cdot (-5) \cdot (-5)$$

$$-2^3 = (-2)^3$$

$$-8 = -8$$

$$\begin{aligned} 1/26 \quad & (-4) - (-3)^2 + (-27) \cdot 3 + (-84) : (-4) + 3 \cdot (-16) = \cdot \\ & = -4 - 9 - 81 + 21 - 48 = \\ & = -121 \end{aligned}$$

$$1/28 \quad cm^2 + cm = ?$$

$$4x^3 - 5x^2 + 6x^3 - 2x^2 = 10x^3 - 7x^2$$

$$3^2 \cdot 3^4 = 3 \cdot 3 \cdot 3 \cdot 3 \cdot 3 \cdot 3 = 3^6$$

$$y^{n+1} \cdot y^2 = y^{n+1+2} = y^{n+3}$$

• $\rightarrow +$
• $\rightarrow -$

$$x^{n+2} : x^{2n} = x^{n+2-2n} = x^{-n+2} = x^{2-n}$$

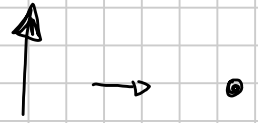
$$a^0 = a^4 : a^4 = \frac{\cancel{a^1} \cdot \cancel{a^1} \cdot \cancel{a^1} \cdot \cancel{a^1}}{\cancel{a^1} \cdot \cancel{a^1} \cdot \cancel{a^1} \cdot \cancel{a^1}} = 1$$

$$(a \cdot b)^3 = a^3 \cdot b^3 = a \cdot b \cdot a \cdot b \cdot a \cdot b$$


$$\frac{b^7}{y^7} = \left(\frac{b}{y}\right)^7$$

1/30

$$(a^6)^2 = a^6 \cdot a^6 = a^{12}$$



Bsp. $\frac{6^3 \cdot 3^1 \cdot 4^4}{3^6 \cdot 6^6 \cdot 4^4} = 6^3 \cdot 3 = 648$

$$0^0 = \frac{0^2}{0^2} = \frac{0 \cdot 0}{0 \cdot 0} = \frac{0}{0}$$


1/31

$$4^{-2} = \frac{4^2}{4^{4-2}} = 4^{2-4} = 4^{-2}$$

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

$$\frac{b^{-n}}{1} = \frac{1}{b^n}$$

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

$$\frac{1}{a^{-2}} = a^2$$

$$\frac{1}{\frac{1}{a^2}} = 1 \cdot \frac{1}{a^2} =$$

$$= 1 \cdot \frac{a^2}{1} = \frac{a^2}{1} = a^2$$

1/32

$$B.7. \left[\left(\frac{2n^6}{m^2} \right)^4 \cdot \left(-\frac{4n^3}{5m} \right)^2 \right] : \left(\frac{25m^2}{2n^3} \right)^2 =$$

 $(2^1 \cdot n^6)^4$

$$= \left[\frac{2^4 n^{24}}{m^8} : + \frac{4^2 n^6}{5^2 m^2} \right] : \frac{25^2 \cdot m^4}{2^2 \cdot n^6} =$$

$$= \frac{2^4 n^{24}}{m^8} \cdot \frac{5^2 m^2}{4^2 \cdot n^6} \cdot \frac{2^2 \cdot n^6}{25^2 \cdot m^4} = \frac{4 \cdot n^{24}}{25 \cdot m^{10}}$$

 $\boxtimes * 2$

B.8

$$\left(\frac{3x^{-2}}{2y} \right)^3 \cdot \left(\frac{3x}{y} \right)^{-1} =$$

$$= \frac{3^3 \cdot x^{-6}}{2^3 \cdot y^3} \cdot \frac{y}{3x} =$$

$$= \frac{3^{\cancel{3}2}}{2^3 x^6 y^{\cancel{3}2}} \cdot \frac{\cancel{y}}{3x} = \frac{9}{8 \cdot x^7 \cdot y^2}$$

$$\frac{3^{-1} \cdot x^{-1}}{y^{-1}} = \frac{y^1}{3^1 \cdot x^1}$$

$$= \frac{y}{3x}$$

B.9

$$\frac{a^{3n-1}}{a^{2n}} \cdot \frac{a^{-n+2}}{a^{-2n+3}} : \frac{(-a)^4}{a^{3-2n}} =$$

$$= \frac{a^{3n-1+(-n+2)}}{a^{2n+(-2n+3)}} : \frac{+a^4}{a^{3-2n}} =$$

$$= \frac{a^{2n+1}}{a^3} \cdot \frac{a^{3-2n}}{a^4} =$$

$$= \frac{a^{(2n+1) + 3(-2n)}}{a^7} = \frac{a^4}{a^{\cancel{7}3}} = \frac{1}{a^3} =$$

$$\left(5^{\frac{1}{2}}\right)^2 = (x)^2$$

$$5^{\frac{1}{2} \cdot 2} = x^2$$

$$5^1 = x^2 = \sqrt[2]{5}$$

$$\Rightarrow x = \sqrt[2]{5}$$

$$\left(4^{\frac{1}{5}}\right)^2 = \left(\sqrt[5]{4}\right)^2$$

$$4^{\frac{2}{5}} = \sqrt[5]{4^2} = \sqrt[5]{16}$$

$$3^{\frac{4}{7}} = \sqrt[7]{3^4}$$

$$\sqrt[5]{x^4} = x^{\frac{4}{5}}$$

$$\sqrt[2]{\sqrt[3]{3}} = \left(3^{\frac{1}{3}}\right)^{\frac{1}{2}} = 3^{\frac{1}{3} \cdot \frac{1}{2}} = 3^{\frac{1}{6}} = \sqrt[6]{3}$$

siehe S. 1/35

$$\sqrt[6]{x^5} : \sqrt[6]{x^2} = x^{\frac{5}{6}} : x^{\frac{2}{6}} = x^{\frac{5}{6} - \frac{2}{6}} = x^{\frac{3}{6}} = \sqrt[2]{x}$$

$$\sqrt[3]{y^2} \cdot \sqrt[5]{y^4} = y^{\frac{2}{3}} \cdot y^{\frac{4}{5}} = y^{\frac{10+12}{15}} = y^{\frac{22}{15}} =$$

$$y^{\frac{17}{15}} = y^1 \cdot y^{\frac{7}{15}} = \sqrt[15]{y^{22}} = \sqrt[15]{y^{15} \cdot y^7} = y \cdot \sqrt[15]{y^7}$$

1/36

$$E-5 \quad 150.000.000 \approx 1,5 \cdot 10^8 \text{ km}$$

1/38

$$x^2 = 25 \quad / \sqrt{\quad}$$

$$x = \sqrt{25}$$

$$x = 5 \quad x = -5$$

$$2^x = 25$$

$$2^4 = 16$$

$$2^5 = 32$$

$$4 < x < 5$$

$$b) \log a = c$$

$$b^c = a$$

$$\text{Bsp. } {}^3 \log 9 = ?$$

$$3^? = 9 \quad ? = 2$$

$${}^{10} \log 1000 = ?$$

$$10^x = 1000$$

$$x = 3$$

$${}^2 \log 1024 = ?$$

$$2^y = 1024 \quad y = 10$$

$${}^5 \log 1 =$$

$$5^z = 1 \quad z = 0$$

$${}^a \log a = 1$$

$$a^1 = a$$

$${}^a \log 1 = 0$$

$$a^0 = 1$$

$${}^a \log a^n = n$$

$$a^n = a^n$$

$${}^2 \log 8 = 3$$

$$2^3 = 8$$

$${}^2 \log \frac{1}{2} = -1$$

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

$${}^2 \log (-4) = \text{blue dot} \quad \text{red lightning bolt} \quad 2^{\text{blue dot}} = -4$$

TR

Ln

Log

log

log

lg

ld ... ${}^2 \log$

naturalis

$e=2,71828$

zur Basis 10
(dekadische)

$${}^b \log (u \cdot v) = \log u + \log v$$

$b^x = u \cdot v$

$$\log \left(\frac{u}{v} \right) = \log u - \log v$$

$$\log u^v = v \cdot \log u$$

012345
1789

$$123456 \cdot 7891011 =$$

A

B

$$10^a \cdot 10^b =$$

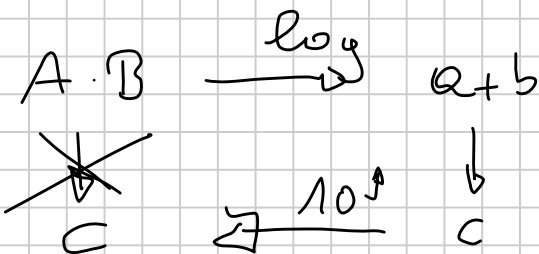
$$10^a = \text{span style="border: 1px solid blue; padding: 2px;">A$$

$$10^b = \text{span style="border: 1px solid blue; padding: 2px;">B$$

$$= 10^{a+b}$$

$$= 10^c \quad \text{TAB} =$$

C



Term

1/42

$$\frac{2-x}{x}$$

Bsp. Busreise

450 €

$z \dots$ Anzahl der Schüler + Lehrer

Kosten

$$K(z) = \frac{450}{z}$$

Zusatz 1: 2 Pers. $K(z) = \frac{450}{z-2}$

Zusatz 1: Eintritt 8,50 € / p.P.

$$K(z) = \frac{450}{z-2} + 8,5$$

Bsp. Handy

Angebot A: 20 € $0,05 \text{ € / min}$
prepaid / Wertkarte

Angebot B: $0,01 \text{ € / min}$ GG: 10 €

$x \dots$ Zeit (min)

$$T_A(x) = 0,05 \cdot x$$

$$T_B(x) = 0,01 \cdot x + 10$$

Definitionsmenge

$$K(z) = \frac{450}{z-2}$$

$$\begin{aligned} D &= \{z \in \mathbb{N} \mid z > 2\} \\ &= \{3, 4, 5, 6, 7, \dots\} \end{aligned}$$

Bsp. $\frac{x}{x+3}$

$$\begin{aligned} D &= \{x \in \mathbb{R} \mid x \neq -3\} \\ &= \mathbb{R} \setminus \{-3\} \\ &\quad \text{"ohne"} \end{aligned}$$

Ausblick

$$(a+b)^2 \neq a^2 + b^2$$

www. Kurtsoeser.at

↳ WiFi - Sonderseite
(google - sites)