

Mathematische Handreichungen - Lösungen -

1. $\frac{3}{4} \cdot \frac{4}{4} = \frac{12}{16}$
2. $\frac{a+b}{c+d} \cdot \frac{f}{f} = \frac{(a+b) \cdot f}{(c+d) \cdot f}$
3. $\frac{a+b}{c+d} \cdot \frac{f \cdot g}{f \cdot g} = \frac{(a+b) \cdot f \cdot g}{(c+d) \cdot f \cdot g}$
4. $\frac{3}{4} \cdot 4 = 3$
5. $\frac{a+b}{c+d} \cdot c = \frac{(a+b) \cdot c}{c+d}$
6. $\frac{a+b}{c+d} \cdot (c+d) = a+b$
7. $\frac{3}{4} \cdot \frac{5}{8} = \frac{15}{32}$
8. $\frac{5}{8} \cdot \frac{3}{4} = \frac{15}{32}$
9. $\frac{1}{3} \cdot 100 = 33\frac{1}{3} = 33,\bar{3}$
10. $30\% \cdot 100 = 30$
11. $\frac{1}{3} = 33\frac{1}{3}\%$
12. $\frac{2200:440}{880:440} = \frac{5}{2}$, $-\frac{81}{99} = -\frac{9}{11}$, $-\frac{70:10}{30:10} = -\frac{7}{3}$, $\frac{910:10}{30:10} = \frac{91}{3}$, $\frac{7777:1111}{1111:1111} = 7$,
 $\frac{a+b+c+d}{b+c} = \frac{a+b+c+d}{b+c}$.
13. $(5:4):3 = \frac{5}{4} : 3 = 0,4\bar{16}$, $5:(4:3) = \frac{5}{\frac{4}{3}} = 3,75$
14. $\frac{k_1}{x} + \frac{k_2}{x} + \frac{k_3}{x} = \frac{k_1+k_2+k_3}{x}$
15. $\frac{K - p_B \cdot x_B}{x_A} \cdot x_A + p_B \cdot x_B = K$
16. $\frac{a \cdot b}{c \cdot d} + \frac{e \cdot f}{g \cdot h} + \frac{i \cdot j}{k \cdot l} = \frac{a \cdot b \cdot g \cdot h \cdot k \cdot l + c \cdot d \cdot e \cdot f \cdot k \cdot l + c \cdot d \cdot g \cdot h \cdot i \cdot j}{c \cdot d \cdot g \cdot h \cdot k \cdot l}$
17. $\frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{5} + \frac{1}{6} + \frac{1}{7} + \frac{1}{8} + \frac{1}{9} + \frac{1}{10} = \frac{4861}{2520}$

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$$18. \left[\left(-4 \frac{1}{3} \right) \cdot 15 \frac{1}{7} \right] : (-2) = \frac{689}{21} = 32,809524.$$

$$19. (a : b) \cdot (b : a) = \frac{a}{b} \cdot \frac{b}{a} = 1$$

$$20. 33 \frac{1}{3} \% + 33 \frac{1}{3} \% + 33 \frac{1}{3} \% = 100\%$$

$$21. 33 \frac{1}{3} \% + 33 \frac{1}{3} \% + 33 \frac{1}{3} \% = 33 \frac{1}{3} \% \cdot (1+1+1) = 3 \cdot 33 \frac{1}{3} \% = 100\%$$

$$22. a \cdot b - a \cdot c + a \cdot d = a \cdot (b - c + d)$$

$$23. \frac{E}{1+r} + \frac{E}{(1+r)^2} + \frac{E}{(1+r)^3} = E \cdot \left[\frac{1}{1+r} + \frac{1}{(1+r)^2} + \frac{1}{(1+r)^3} \right]$$

$$24. NZ = NZB + \frac{NA - NAB}{NAS - NAB} \cdot (NZS - NZB) = NZB + \frac{-(-NA + NAB)}{-(-NAS + NAB)} \cdot (NZS - NZB) = NZB + \frac{NAB - NA}{NAB - NAS} \cdot (NZS - NZB)$$

$$25. \frac{VWK}{HKdU} \cdot hk_1 \cdot xa_1 + \frac{VWK}{HKdU} \cdot hk_2 \cdot xa_2 + \frac{VWK}{HKdU} \cdot hk_3 \cdot xa_3 = \frac{VWK}{HKdU} \cdot (hk_1 \cdot xa_1 + hk_2 \cdot xa_2 + hk_3 \cdot xa_3)$$

$$26. (-333ax) + (-12ay) - 13ax + 20ay - (-6ax) = 8ay - 340ax$$

$$27. a \cdot 10^n + b \cdot 10^{n+1} - b \cdot 10^n - a \cdot 10^{n+1} = 9 \cdot 10^n \cdot (b - a)$$

$$28. a \cdot 10^n + b \cdot 10^{n+m} - b \cdot 10^n - a \cdot 10^{n+m} = 10^n \cdot (10^m - 1) \cdot (b - a)$$

$$29. 10^0 = 1$$

$$30. 10^1 = 10$$

$$31. 10^{0,5} = 10^{\frac{1}{2}} = \sqrt{10} = 3,162278$$

$$32. 10^{1,5} = 10^{\frac{3}{2}} = \sqrt{10^3} = \sqrt{1000} = 31,622777$$

$$33. 10^{-1} = \frac{1}{10^1} = 0,1$$

$$34. 10^{-0,5} = \frac{1}{10^{0,5}} = \frac{1}{\sqrt{10}} = 0,316228$$

$$35. 10^{-1,5} = \frac{1}{10^{1,5}} = \frac{1}{10^{\frac{3}{2}}} = \frac{1}{\sqrt{10^3}} = 0,031623$$

$$36. a^0 = 1$$

$$37. a^1 = a$$

$$38. a^b \cdot a^{-b} = a^0 = 1$$

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$$39. a^b + a^b + a^b = 3a^b$$

$$40. a^b \cdot a^b \cdot a^b = a^{3b}$$

$$41. a^2 \cdot a^3 = a^5$$

$$42. \frac{a^2}{a^3} = \frac{1}{a}$$

$$43. \frac{a^m}{a^n} = a^{m-n}$$

$$44. \frac{a^0}{a^n} = a^{-n} = \frac{1}{a^n}$$

$$45. \sqrt[3]{a} \cdot \sqrt[3]{a} \cdot \sqrt[3]{a} = a$$

$$46. a^{\frac{1}{3}} \cdot a^{\frac{1}{3}} \cdot a^{\frac{1}{3}} = a$$

$$47. a^{\frac{2}{3}} \cdot a^{\frac{2}{3}} \cdot a^{\frac{2}{3}} = a^2$$

$$48. \sqrt[3]{a^2} \cdot \sqrt[3]{a^2} \cdot \sqrt[3]{a^2} = a^2$$

$$49. \sqrt[3]{10^2} = 4,641589$$

$$50. \sqrt[n]{a^m} = a^{\frac{m}{n}}$$

$$51. (a+b)^2 = a^2 + 2ab + b^2$$

$$52. (a-b)^2 = a^2 - 2ab + b^2$$

$$53. (a \cdot b + c \cdot d)^2 = a^2 \cdot b^2 + 2 \cdot a \cdot b \cdot c \cdot d + c^2 \cdot d^2$$

$$54. (a \cdot b - c \cdot d)^2 = a^2 \cdot b^2 - 2 \cdot a \cdot b \cdot c \cdot d + c^2 \cdot d^2$$

$$55. \left(\frac{5}{12} + \frac{6}{17}\right)^2 = \frac{24649}{41616} = 0,592296$$

$$56. \left(\frac{5}{12} + \frac{6}{17} + \frac{13}{8}\right)^2 = \frac{954529}{166464} = 5,734147$$

$$57. \left(1 + \frac{1}{1}\right)^1 = 2$$

$$58. \left(1 + \frac{1}{10}\right)^{10} = 2,593742$$

$$59. \left(1 + \frac{1}{100}\right)^{100} = 2,704814$$

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$$60. \left(1 + \frac{1}{1000}\right)^{1000} = 2,716924$$

$$61. x = 5$$

$$62. x = 5$$

$$63. x_1 = -6, x_2 = 4$$

$$64. K_0 = \frac{K_t}{(1+i)^t}$$

$$65. i = \sqrt[t]{\frac{K_t}{K_0}} - 1$$

$$66. x = 1$$

$$67. x = 2$$

$$68. x = 3$$

$$69. x = \log 50 = 1,698970$$

$$70. x = \frac{\log b}{\log a}, x = \frac{\ln b}{\ln a}$$

$$71. 1 \text{ TB CI} = \frac{10^{12}}{2^{30}} \text{ GB}$$

$$72. y = \frac{c}{x}$$

$$73. y = \pm \sqrt{r^2 - x^2}$$

$$74. \frac{\Delta y}{\Delta x} = b$$

$$75. y' = 2x$$

$$76. y' = 3x^2$$

$$77. y' = 2ax$$

$$78. y' = a \cdot n \cdot x^{n-1}$$

$$79. y' = -10x^{-2}$$

$$80. y' = -\frac{10}{x^2}$$

$$81. y' = \frac{10}{x^2}$$

$$82. \frac{x \cdot K' - K}{x^2}$$

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$$83. K' = \frac{K}{x}$$

$$84. K' = 3x^2 - 24x + 60$$

$$85. K'' = 6x - 24$$

$$86. k_V' = 2x - 12$$

$$87. k' = 2x - 12 - \frac{98}{x^2}$$

$$88. x = \frac{G + K_F}{p - k_V}$$

$$89. x = \frac{K_F}{p - k_V}$$

$$90. x = \frac{G + K_F}{db}$$

$$91. x = \frac{K_F}{db}$$

$$92. BW = A \cdot \frac{(1+i)^n - 1}{i \cdot (1+i)^n}$$

$$93. r = \frac{E}{A_0}$$

$$94. BW = \frac{A}{i}$$

$$95. a = e \cdot f \cdot (c - d) - b$$

$$96. b = e \cdot f \cdot (c - d) - a$$

$$97. c = \frac{a + b + d \cdot e \cdot f}{e \cdot f}$$

$$98. d = \frac{e \cdot f \cdot c - a - b}{e \cdot f}$$

$$99. e = \frac{a + b}{(c - d) \cdot f}$$

$$100. f = \frac{a + b}{(c - d) \cdot e}$$