

Löse die Gleichungen nach  $k$  auf:

a)  $\frac{1}{k} - \frac{1}{2} \cdot \frac{1}{k} = 2$

b)  $2 - \sqrt{\frac{k}{4}} = \sqrt{\frac{k}{4}}, \quad k > 0$

c)  $\sqrt{1 + k^2 + 16} = 9$

d)  $2^k + 2^{k+1} = 1$

e)  $2e^{-k} - e^{-2k} = 0$

f)  $\ln k + \ln(2k) = 2, \quad k > 0$

g)  $(k + 1)^2 = a, \quad a > 0$

h)  $\frac{1}{k} + \frac{1}{k^2} = 2$

i)  $k^4 - 4k^2 = 0$

j)  $x^3 = 4x$

k)  $x^4 - x^2 - 12 = 0$

l)  $3 - e^x = \frac{2}{e^x}$

m)  $ae^{-3x} - be^{-2x} = 0, \quad a, b > 0$       Ergebnis ohne Minus-Zeichen

n)  $\frac{1}{5} - 4\left(x - \frac{1}{5}\right) = 1$       Die 2. Zeile soll keinen Bruch enthalten.

Löse die Gleichungen nach  $k$  auf:

$$\text{a) } \frac{1}{k} - \frac{1}{2} \cdot \frac{1}{k} = 2 \qquad k = \frac{1}{4}$$

$$\text{b) } 2 - \sqrt{\frac{k}{4}} = \sqrt{\frac{k}{4}}, \quad k > 0 \qquad k = 4$$

$$\text{c) } \sqrt{1 + k^2 + 16} = 9 \qquad k_{1/2} = \pm 8$$

$$\text{d) } 2^k + 2^{k+1} = 1 \qquad k = -\frac{\ln 3}{\ln 2}$$

$$\text{e) } 2e^{-k} - e^{-2k} = 0 \qquad k = -\ln 2$$

$$\text{f) } \ln k + \ln(2k) = 2, \quad k > 0 \qquad k = \frac{e}{\sqrt{2}}$$

$$\text{g) } (k + 1)^2 = a, \quad a > 0 \qquad k_{1/2} = -1 \pm \sqrt{a}$$

$$\text{h) } \frac{1}{k} + \frac{1}{k^2} = 2 \qquad k_1 = 1, \quad k_2 = -\frac{1}{2}$$

$$\text{i) } k^4 - 4k^2 = 0 \qquad k_1 = 0, \quad k_{2/3} = \pm 2$$

$$\text{j) } x^3 = 4x \qquad x_1 = 0, \quad x_{2/3} = \pm 2$$

$$\text{k) } x^4 - x^2 - 12 = 0 \qquad u = x^2, \quad u^2 - u - 12 = 0, \quad u_1 = 4, \quad u_2 = -3, \quad x_{1/2} = \pm 2$$

$$\text{l) } 3 - e^x = \frac{2}{e^x} \qquad u = e^x, \quad u^2 - 3u + 2 = 0, \quad u_1 = 1, \quad u_2 = 2, \quad x_1 = 0, \quad x_2 = \ln 2$$

$$\text{m) } ae^{-3x} - be^{-2x} = 0, \quad a, b > 0 \qquad x = \ln \frac{a}{b}$$

$$\text{n) } \frac{1}{5} - 4\left(x - \frac{1}{5}\right) = 1 \quad | \cdot 5 \qquad x = 0$$

# Umstellen von Formeln

a)  $s = \frac{1}{2}at^2$  ( $t \geq 0$ ),  $t = ?$

b)  $V = \frac{1}{3}\pi r^2 h$ ,  $h = ?$

c)  $U = \frac{D+d}{2}\pi$ ,  $d = ?$

d)  $f = \frac{1}{2\pi\sqrt{LC}}$ ,  $L = ?$

e)  $A = \frac{\pi}{4}(D^2 - d^2)$  ( $d \geq 0$ ),  $d = ?$

f)  $y = ae^{-kt}$ ,  $t = ?$

g)  $y = \frac{a}{b + e^{-kx}}$ ,  $k = ?$

h)  $b = \frac{2^{a+x}}{2^{a-x}}$ ,  $x = ?$

## Umstellen von Formeln

a)  $s = \frac{1}{2}at^2 \quad (t \geq 0)$

$$t = \sqrt{\frac{2s}{a}}$$

b)  $V = \frac{1}{3}\pi r^2 h$

$$h = \frac{3V}{\pi r^2}$$

c)  $U = \frac{D+d}{2}\pi$

$$d = \frac{2U}{\pi} - D = \frac{2U - \pi D}{\pi}$$

d)  $f = \frac{1}{2\pi\sqrt{LC}}$

$$L = \frac{1}{4Cf^2\pi^2}$$

e)  $A = \frac{\pi}{4}(D^2 - d^2) \quad (d \geq 0)$

$$d = \sqrt{D^2 - \frac{4A}{\pi}}$$

f)  $y = ae^{-kt}$

$$t = -\frac{1}{k} \ln \frac{y}{a} = \frac{1}{k} \ln \frac{a}{y}$$

g)  $y = \frac{a}{b + e^{-kx}}$

$$k = -\frac{1}{x} \ln \frac{a-by}{y} = \frac{1}{x} \ln \frac{y}{a-by}$$

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

$$x = \frac{1}{2} \frac{\ln b}{\ln 2}$$

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