Löse die Gleichungen nach k auf:

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

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

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

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

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

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

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

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

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

Löse die Gleichungen nach x auf:

j) $\quad x^3 = 4x$

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

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

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

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

Löse die Gleichungen nach k auf:

a) $\quad \frac{1}{k} - \frac{1}{2} \cdot \frac{1}{k} = 2$ $\hfill k = \frac{1}{4}$

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

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

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

e) $\quad 2e^{-k} - e^{-2k} = 0$ $\hfill k = -\ln 2$

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

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

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

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

Löse die Gleichungen nach x auf:

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

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

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

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

n) $\quad \frac{1}{5} - 4\left(x - \frac{1}{5}\right) = 1 \ \mid \cdot 5$ $\hfill x = 0$

Umstellen von Formeln

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

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

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

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

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

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

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

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

Umstellen von Formeln

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

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

c) $\quad U = \dfrac{D+d}{2}\pi$ $\qquad\qquad\qquad\quad d = \dfrac{2U}{\pi} - D = \dfrac{2U - \pi D}{\pi}$

d) $\quad f = \dfrac{1}{2\pi\sqrt{LC}}$ $\qquad\qquad\qquad\quad L = \dfrac{1}{4Cf^2\pi^2}$

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

f) $\quad y = ae^{-kt}$ $\qquad\qquad\qquad\qquad\quad t = -\frac{1}{k}\ln\frac{y}{a} = \frac{1}{k}\ln\frac{a}{y}$

g) $\quad y = \dfrac{a}{b + e^{-kx}}$ $\qquad\qquad\qquad k = -\frac{1}{x}\ln\dfrac{a - by}{y} = \frac{1}{x}\ln\dfrac{y}{a - by}$

h) $\quad b = \dfrac{2^{a+x}}{2^{a-x}}$ $\qquad\qquad\qquad\qquad x = \frac{1}{2}\dfrac{\ln b}{\ln 2}$