

Quadr. Gleichungen neu 1045 - Lösungen

(1) Produkt: $x^2 - 7x + 6 = (x-1)(x-6)$ $D = \mathbb{R}$
 $K = \{1, 6\}$ (2P)

(2) Quadr. Ergänzung: $D = \mathbb{R}$

$$(x+2)(x-1) = 2 \Rightarrow x^2 + x - 2 = 2$$

$$x^2 + x = 4$$

$$a = x$$

$$2ab = x \rightarrow 2b = 1, b = \frac{1}{2}$$

$$\left(x + \frac{1}{2}\right)^2 = 4 + \left(\frac{1}{2}\right)^2 \quad | \sqrt{\quad} \quad (4P)$$

$$x + \frac{1}{2} = \sqrt{4,25} = \pm 2,062$$

$$x_1 = 1,562$$

$$x_2 = -1,562$$

$$K = \{1,562 / -1,562\}$$

(3) $\frac{22}{2x-6} + 3 = x + \frac{10}{6-2x}$ $D = \mathbb{R} \setminus \{3\}$

$$\frac{11}{x-3} + 3 = x - \frac{5}{x-3} \quad | \cdot (x-3)$$

$$11 + 3x - 9 = x^2 - 3x - 5$$

$$x_{1,2} = \frac{6 \pm \sqrt{36 + 28}}{2} = \frac{6 \pm \sqrt{64}}{2} = \frac{6 \pm 8}{2}$$

$$x_1 = 7 \quad x_2 = -1$$

$$K = \{-1 / 7\}$$

(4) 1) $x + y + 41y = 456$

2) $4y + 2x - 42 \Rightarrow 2x = 42 - 4y$
 $x = 21 - 2y$

1) $y(21 - 2y) + 41y - 456 = 0$

$$21y - 2y^2 + 41y - 456 = 0$$

$$2y^2 - 62y + 456 = 0$$

$$y^2 - 31y + 228 = 0$$

$$D = \mathbb{R} \times \mathbb{R}$$

$$y_{1,2} = \frac{31}{2} \pm \sqrt{\frac{31^2}{4} - 228}$$

$$y_{1,2} = 15,5 \pm 3,5$$

$$y_1 = 19 \rightarrow x_1 = 2$$

$$y_2 = 12 \rightarrow x_2 = -3$$

$$K = \{(-3 / 12) / (2 / 19)\}$$

(5P)

$$\textcircled{5} \quad \frac{x-4}{4a} = \frac{a-2}{x} \quad | \cdot 4ax \quad D = \mathbb{R} \setminus \{0\}, a \neq 0$$

$$x^2 - 4x = 4a^2 - 8a$$

$$x^2 - 4x - 4a^2 + 8a = 0 \quad p = -4 \quad q = -(4a^2 - 8a)$$

$$x_{1,2} = 2 \pm \sqrt{\frac{16}{4} + 4a^2 - 8a} = 2 \pm \sqrt{4a^2 - 8a + 4} \\ = 2 \pm \sqrt{(2a-2)^2}$$

$$x_1 = 2 - (2a-2) = 4-2a$$

$$x_2 = 2 + (2a-2) = 2a$$

$$L = \{2a \mid 4-2a\}$$

$$\textcircled{6} \quad \text{Excel} \quad x_1 = -1; x_2 = 3 \rightarrow \text{berechnet}$$