

Gleichungssysteme linear – Lösung

| Aufgabe | Lösung |
|---------|---|
| 1 | $1) \frac{2}{5}x + \frac{5}{6}y = -11 \quad \cdot \frac{5}{6}y \Rightarrow \frac{2}{5}x = -\frac{5}{6}y - 11 \quad D = \mathbb{Q} \times \mathbb{Q}$ $2) \frac{1}{3}x - \frac{1}{6}y = -4 \quad \cdot 2 \Rightarrow \frac{2}{3}x = \frac{1}{3}y - 8$ $1) - 2) \quad -\frac{5}{6}y - 11 = \frac{1}{3}y - 8 \quad + \frac{5}{6}y + 8$ $-3 = \frac{7}{6}y \quad \cdot \frac{6}{7}$ $-\frac{18}{7} = -2\frac{4}{7} = y$ $2) \quad \frac{2}{5}x = \frac{1}{3} \cdot \left(-\frac{18}{7}\right) - 8$ $\frac{2}{5}x = -\frac{6}{7} - 8 = -\frac{62}{7} \quad \cdot \frac{5}{2}$ $x = -\frac{62 \cdot 5}{7 \cdot 2} = -\frac{93}{7} = -13\frac{2}{7} \Rightarrow \underline{\underline{L = \left\{ \left(-13\frac{2}{7} \mid -2\frac{4}{7}\right) \right\}}}$ |
| 2 | $1) \frac{3}{x} + \frac{4}{y} = 2\frac{1}{2} \quad \cdot 4$ $2) \frac{4}{x} + \frac{5}{y} = 3\frac{1}{6} \quad \cdot (-3)$ $1) \quad \frac{12}{x} + \frac{16}{y} = \frac{20}{2} = 10$ $2) \quad -\frac{12}{x} - \frac{15}{y} = -\frac{11}{2}$ <hr/> $1) + 2) \quad \frac{1}{y} = \frac{1}{2} \quad \cdot 2y \quad \rightarrow \quad 1) \quad \frac{3}{x} + 2 = \frac{5}{2} \Rightarrow \frac{3}{x} = \frac{1}{2} \quad \cdot$ $2 = y \quad \cdot \quad 6 = x \Rightarrow \underline{\underline{L = \{(6 2)\}}}$ |

3

$$1) \frac{5}{x+1} = \frac{3}{y-4} \quad | \cdot (x+1)(y-4) \quad \Rightarrow \mathbb{D} = \{x \neq -1, y \neq 4\}$$

$$2) \frac{6}{x-3} = \frac{11}{y+1} \quad | \cdot (x-3)(y+1)$$

$$1) 5y - 20 = 3x + 3 \quad \Rightarrow 5y - 3x = 23 \quad | :6$$

$$2) 6y + 6 = 11x - 33 \quad \Rightarrow 6y - 11x = -39 \quad | \cdot (-5)$$

$$1) 30y - 18x = 138$$

$$2) -30y + 55x = 195$$

$$1+2) \quad 37x = 333 \quad | :37$$

$$x = 9$$

$$1) 5y - 27 = 23 \quad | +27$$

$$5y = 50 \quad | :5$$

$$y = 10 \quad \Rightarrow \mathbb{L} = \{(9|10)\}$$

4

$$1) \frac{3}{10x} - \frac{2}{3y} = \frac{4}{20} \quad | \cdot \left(\frac{2}{3}\right)$$

$$\mathbb{D} = \{x \neq 0, y \neq 0\}$$

$$2) \frac{2}{3x} - \frac{5}{2y} = \frac{1}{12} \quad | \cdot \frac{3}{10}$$

$$1) -\frac{6}{30x} + \frac{4}{5y} = \frac{8}{45}$$

$$2) \frac{6}{30x} - \frac{15}{20y} = \frac{1}{40}$$

$$\frac{4}{5y} - \frac{3}{4y} = \frac{1}{40} - \frac{8}{45} \quad | \cdot 36y$$

$$16 - 27 = \frac{36}{40} - \frac{8 \cdot 36}{45} y$$

$$-11 = \left(\frac{9}{10} - \frac{64}{10}\right) y = -\frac{55}{10} y \quad | \cdot \left(-\frac{10}{55}\right)$$

$$y = \frac{+11 \cdot 10^2}{+55 \cdot 11} = 2$$

$$2) \frac{2}{3x} - \frac{5}{4} = \frac{1}{12} \quad | \cdot 12x$$

$$8 - 15x = x$$

$$8 = 16x \quad | :16$$

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

$$\mathbb{L} = \left\{ \left(\frac{1}{2} | 2 \right) \right\}$$

5

$$1) a^2x - b^2y = a - b$$

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

$$2) 2ax + b^2y = ax + b + 1$$

$$1) + 2) \quad a^2x + 2ax = ax + a + 1 \quad | -ax$$

$$a^2x + ax = a + 1$$

$$x(a^2 + a) = a + 1 \quad | : (a^2 + a)$$

$$x = \frac{a+1}{a(a+1)} = \frac{1}{a} \Rightarrow 1) \frac{a^2}{a} - b^2y = a - b \quad | + b^2y + b - a$$

$$a - a + b = b^2y \quad | : b^2$$

$$\frac{b}{b^2} = \frac{1}{b} = y$$

$$K = \left\{ \left(\frac{1}{a} \mid \frac{1}{b} \right) \right\}, \text{ bei } a \neq 0; b \neq 0$$