

Aufgaben:

Berechne die Lösungsmenge der Gleichungssysteme.

1.1

$$\begin{array}{l|l} (1) & -3y+2x=7 \\ (2) & \wedge \quad 4x=5y+2 \end{array}$$

1.2

$$\begin{array}{l|l} (1) & 4y=3x-2 \\ (2) & \wedge \quad 6+4x=y \end{array}$$

1.3

$$\begin{array}{l|l} (1) & -2y-4x=20-2x \\ (2) & \wedge \quad -1=-2(3x-2y)+7 \end{array}$$

1.4

$$\begin{array}{l|l} (1) & 4=-6x-2y \\ (2) & \wedge \quad 3x=5y \end{array}$$

1.5

$$\begin{array}{l|l} (1) & 4y-x=10+3x \\ (2) & \wedge \quad 7=2(x-4y) \end{array}$$

1.6

$$\begin{array}{l|l} (1) & 4y-2x=10+x \\ (2) & \wedge \quad x-8y=-5 \end{array}$$

Lösungen:

Berechne die Lösungsmenge der Gleichungssysteme.

1. 1

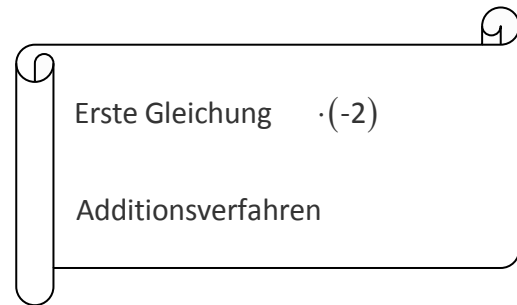
$$\begin{array}{l} (1) \quad -3y+2x=7 \\ (2) \quad \wedge \quad 4x=5y+2 \end{array}$$

$$\begin{array}{l} (1) \quad 6y-4x=-14 \\ (2) \quad \wedge \quad 4x=5y+2 \end{array}$$

$$\begin{array}{l} (1) + (2) \quad 6y-4x+4x=-14+5y+2 \\ \quad \quad \quad 6y=-12+5y \\ \quad \quad \quad y=-12 \end{array}$$

$$\begin{array}{l} (2) \quad 4x=5 \cdot (-12)+2 \\ \quad \quad 4x=-58 \\ \quad \quad x=-14,5 \end{array}$$

$$\mathbb{L} = \{ (-14,5 \mid -12) \}$$



1.2

$$(1) \quad 4y=3x-2$$

$$(2) \quad \wedge \quad 6+4x=y$$

Einsetzungsverfahren

$$(2) \text{ in } (1) \quad 4(6+4x)=3x-2$$

$$24+16x=3x-2$$

$$13x=-26$$

$$x=-2$$

$$(2) \quad 4 \cdot y=3 \cdot (-2)-2$$

$$4 \cdot y=-8$$

$$y=-2$$

$$\mathbb{L} = \{ (-2 \mid -2) \}$$

1.3

$$\begin{array}{l} (1) \quad -2y-4x=20-2x \\ (2) \quad \wedge -1=-2(3x-2y)+7 \end{array}$$

$$\begin{array}{l} (1) \quad -2y=20+2x \\ (2) \quad \wedge -8=-6x+4y \end{array}$$

$$\begin{array}{l} (1) \quad -6y=60+6x \\ (2) \quad \wedge -8=-6x+4y \end{array}$$

$$\begin{array}{l} (1) + (2) \quad -6y-8=60+6x-6x+4y \\ \quad -6y-8=60+4y \\ \quad -68=10y \\ \quad y=-6,8 \end{array}$$

$$\begin{array}{l} (1) \quad -6 \cdot (-6,8)=60+6x \\ \quad -19,2=6x \\ \quad x=-3,2 \end{array}$$

$$\mathbb{L} = \{ (-3,2 \mid -6,8) \}$$

Vereinfachung

Erste Gleichung $\cdot 3$

Additionsverfahren

1.4

$$\begin{array}{l} (1) \quad 4 = -6x - 2y \\ (2) \quad \wedge \quad 3x = 5y \end{array}$$

$$\begin{array}{l} (1) \quad 6x = -4 - 2y \\ (2) \quad \wedge \quad 3x = 5y \end{array}$$

$$\begin{array}{l} (1) \quad 3x = -2 - y \\ (2) \quad \wedge \quad 3x = 5y \end{array}$$

$$\begin{array}{l} (1) = (2) \quad -2 - y = 5y \\ \quad \quad \quad -2 = 6y \\ \quad \quad \quad y = -\frac{1}{3} \end{array}$$

$$\begin{array}{l} (2) \quad 3x = 5y \\ \quad \quad 3x = 5 \cdot \left(-\frac{1}{3}\right) \\ \quad \quad 3x = -\frac{5}{3} \\ \quad \quad x = -\frac{5}{9} \end{array}$$

$$\mathbb{L} = \left\{ \left(-\frac{1}{3} \mid -\frac{5}{9} \right) \right\}$$

Erste Gleichung $\cdot \frac{1}{2}$

Additionsverfahren

1.5

$$\begin{array}{l} (1) \quad 4y - x = 10 + 3x \\ (2) \quad \wedge \quad 7 = 2(x - 4y) \end{array}$$

$$\begin{array}{l} (1) \quad 4y = 10 + 4x \\ (2) \quad \wedge \quad 7 = 2x - 8y \end{array}$$

$$\begin{array}{l} (1) \quad 4y - 10 = 4x \\ (2) \quad \wedge \quad 7 + 8y = 2x \end{array}$$

$$\begin{array}{l} (1) \quad 4y - 10 = 4x \\ (2) \quad \wedge \quad 14 + 16y = 4x \end{array}$$

$$\begin{array}{l} (1) = (2) \quad 4y - 10 = 14 + 16y \\ \quad \quad \quad -12y = 24 \\ \quad \quad \quad y = -2 \end{array}$$

$$\begin{array}{l} (2) \quad 7 + 8 \cdot (-2) = 2x \\ \quad \quad \quad -9 = 2x \\ \quad \quad \quad x = -4,5 \end{array}$$

$$\mathbb{L} = \{ (-4,5 \mid -2) \}$$

Erste Gleichung $\cdot \frac{1}{2}$

Additionsverfahren

1.6

$$\begin{array}{l} (1) \quad 4y - 2x = 10 + x \\ (2) \quad \wedge \quad x - 8y = -5 \end{array}$$

$$\begin{array}{l} (1) \quad 4y - 3x = 10 \\ (2) \quad \wedge \quad x - 8y = -5 \end{array}$$

$$\begin{array}{l} (1) \quad 8y - 6x = 20 \\ (2) \quad \wedge \quad x - 8y = -5 \end{array}$$

$$\begin{array}{l} (1) + (2) \quad 8y - 6x + x - 8y = 20 - 5 \\ \quad \quad \quad -5x = 15 \\ \quad \quad \quad x = -3 \end{array}$$

$$\begin{array}{l} (2) \quad -3 - 8y = -5 \\ \quad \quad -8y = -2 \\ \quad \quad y = 0,25 \end{array}$$

$$\mathbb{L} = \{ (-3 \mid 0,25) \}$$

Erste Gleichung $\cdot 2$

Additionsverfahren