

Gauß-Verfahren

G.Roofls

a) $x - 4y - 2z = 4$

b) $2x - 3y + z = -2$

c) $3x + y + 2z = 1$

$$\text{a) } \quad x - 4y - 2z = 4 \quad | \cdot (-2) + \text{b)}$$

$$\text{b) } \quad 2x - 3y + z = -2$$

$$\text{c) } \quad \underline{3x + y + 2z = 1}$$

$$\text{a) } \quad x - 4y - 2z = 4 \quad | \cdot(-2) + \text{b)} \quad | \cdot(-3) + \text{c)}$$

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$$x - 4y - 2z = 4$$

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$$x - 4y - 2z = 4$$

$$5y + 5z = -10$$

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$$x - 4y - 2z = 4$$

$$5y + 5z = -10$$

$$13y + 8z = -11$$

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$$5y + 5z = -10 \quad | \cdot\left(-\frac{13}{5}\right) + \text{d)}$$

$$\text{d) } \quad 13y + 8z = -11$$

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$$x - 4y - 2z = 4$$

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$$-5z = 15$$

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$$5y + 5z = -10$$

$$-5z = 15$$

$$z = -3$$

$$y = 1$$

$$x = 2$$

$$2y + z = 4$$

$$2x + 5y - 2z = -1$$

$$x + 3y - 3z = -4$$

$$2y + z = 4$$

$$2x + 5y - 2z = -1$$

$$x + 3y - 3z = -4$$

Gleichungssystem ordnen

a) $x + 3y - 3z = -4$

b) $2x + 5y - 2z = -1$

c) $2y + z = 4$

$$\text{a) } \quad x + 3y - 3z = -4 \quad | \cdot (-2) + \text{b)}$$

$$\text{b) } \quad 2x + 5y - 2z = -1$$

$$\text{c) } \quad \underline{\quad 2y + z = 4}$$

$$\text{a) } \quad x + 3y - 3z = -4 \quad | \cdot (-2) + \text{b)}$$

$$\text{b) } \quad 2x + 5y - 2z = -1$$

$$\text{c) } \quad \quad 2y + z = 4$$

$$x + 3y - 3z = -4$$

$$\text{a) } \quad x + 3y - 3z = -4 \quad | \cdot (-2) + \text{b)}$$

$$\text{b) } \quad 2x + 5y - 2z = -1$$

$$\text{c) } \quad \quad \quad 2y + z = 4$$

$$x + 3y - 3z = -4$$

$$\quad \quad -y + 4z = 7$$

$$\text{a) } \quad x + 3y - 3z = -4 \quad | \cdot (-2) + \text{b)}$$

$$\text{b) } \quad 2x + 5y - 2z = -1$$

$$\text{c) } \quad \quad 2y + z = 4$$

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$$\text{b) } \quad 2x + 5y - 2z = -1$$

$$\text{c) } \quad \quad 2y + z = 4$$

$$x + 3y - 3z = -4$$

$$\quad -y + 4z = 7 \quad | \cdot 2 + \text{d)}$$

$$\text{d) } \quad \quad 2y + z = 4$$

$$\text{a) } \quad x + 3y - 3z = -4 \quad | \cdot (-2) + \text{b)}$$

$$\text{b) } \quad 2x + 5y - 2z = -1$$

$$\text{c) } \quad \quad \quad 2y + z = 4$$

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$$x + 3y - 3z = -4$$

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$$x + 3y - 3z = -4$$

$$-y + 4z = 7 \quad | \cdot 2 + \text{d)}$$

$$\text{d) } \quad 2y + z = 4$$

$$x + 3y - 3z = -4$$

$$-y + 4z = 7$$

$$+ 9z = 18$$

$$z =$$

$$\text{a) } \quad x + 3y - 3z = -4 \quad | \cdot (-2) + \text{b)}$$

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$$\text{d) } \quad 2y + z = 4$$

$$x + 3y - 3z = -4$$

$$-y + 4z = 7$$

$$+ 9z = 18$$

$$z = 2$$

$$y =$$

$$\text{a) } \quad x + 3y - 3z = -4 \quad | \cdot (-2) + \text{b)}$$

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$$+ 9z = 18$$

$$z = 2$$

$$y = 1$$

$$x =$$

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a) $x - 2y + 3z = 4$

b) $3x + y - 5z = 5$

c) $2x - 3y + 4z = 7$

$$\text{a) } \quad x - 2y + 3z = 4 \quad | \cdot (-3) + \text{b)}$$

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$$\text{a) } \quad x - 2y + 3z = 4 \quad | \cdot (-3) + \text{b) } \quad | \cdot (-2) + \text{c) }$$

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$$x - 2y + 3z = 4$$

$$\begin{array}{lcl} \text{a)} & x - 2y + 3z = 4 & | \cdot (-3) + b) \quad | \cdot (-2) + c) \\ \text{b)} & 3x + y - 5z = 5 & \\ \text{c)} & 2x - 3y + 4z = 7 & \\ & \hline & x - 2y + 3z = 4 & \\ & & 7y - 14z = -7 & \end{array}$$

$$\text{a) } \quad x - 2y + 3z = 4 \quad | \cdot (-3) + \text{b) } \quad | \cdot (-2) + \text{c)}$$

$$\text{b) } \quad 3x + y - 5z = 5$$

$$\text{c) } \quad 2x - 3y + 4z = 7$$

$$x - 2y + 3z = 4$$

$$7y - 14z = -7$$

$$y - 2z = -1$$

$$\text{a) } \quad x - 2y + 3z = 4 \quad | \cdot (-3) + \text{b) } \quad | \cdot (-2) + \text{c)}$$

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$$\text{c) } \quad 2x - 3y + 4z = 7$$

$$x - 2y + 3z = 4$$

$$7y - 14z = -7 \quad | : 7$$

$$\text{d) } \quad y - 2z = -1$$

a) $x - 2y + 3z = 4$

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 $x - 2y + 3z = 4$

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d) $y - 2z = -1$

 $x - 2y + 3z = 4$

$y - 2z = -1 \quad | \cdot (-1) + e)$

e) $y - 2z = -1$

a) $x - 2y + 3z = 4$

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 $x - 2y + 3z = 4$

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 $x - 2y + 3z = 4$

$y - 2z = -1$ | $\cdot (-1) + e$

e) $y - 2z = -1$

 $x - 2y + 3z = 4$

$y - 2z = -1$

$0 = 0$

a) $x - 2y + 3z = 4$

b) $3x + y - 5z = 5$

c) $2x - 3y + 4z = 7$

 $x - 2y + 3z = 4$

$7y - 14z = -7$ | : 7

d) $y - 2z = -1$

 $x - 2y + 3z = 4$

$y - 2z = -1$ | $\cdot (-1) + e$

e) $y - 2z = -1$

 $x - 2y + 3z = 4$

$y - 2z = -1$

$0 = 0$

2 Gleichungen, 3 Unbekannte:

a) $x - 2y + 3z = 4$

b) $3x + y - 5z = 5$

c) $2x - 3y + 4z = 7$

 $x - 2y + 3z = 4$

$7y - 14z = -7 \quad | : 7$

d) $y - 2z = -1$

 $x - 2y + 3z = 4$

$y - 2z = -1 \quad | \cdot (-1) + e$

e) $y - 2z = -1$

 $x - 2y + 3z = 4$

$y - 2z = -1$

$0 = 0$

2 Gleichungen, 3 Unbekannte: Es gibt unendlich viele Lösungen.

$$x - 2y + 3z = 4$$

$$y - 2z = -1$$

$$0 = 0$$

$$x - 2y + 3z = 4$$

$$y - 2z = -1$$

$$0 = 0$$

$$z = k$$

$$x - 2y + 3z = 4$$

$$y - 2z = -1$$

$$0 = 0$$

$$z = k$$

$$y =$$

$$x - 2y + 3z = 4$$

$$y - 2z = -1$$

$$0 = 0$$

$$z = k$$

$$y = -1 + 2k$$

$$x - 2y + 3z = 4$$

$$y - 2z = -1$$

$$0 = 0$$

$$z = k$$

$$y = -1 + 2k$$

$$x =$$

$$x - 2y + 3z = 4$$

$$y - 2z = -1$$

$$0 = 0$$

$$z = k$$

$$y = -1 + 2k$$

$$x = 2 + k$$

$$x - 2y + 3z = 4$$

$$y - 2z = -1$$

$$0 = 0$$

$$z = k$$

$$y = -1 + 2k$$

$$x = 2 + k$$

$$\begin{pmatrix} 2+k \\ -1+2k \\ k \end{pmatrix} = \begin{pmatrix} 2 \\ -1 \\ 0 \end{pmatrix} + k \begin{pmatrix} 1 \\ 2 \\ 1 \end{pmatrix}, \quad k \in \mathbb{R}$$