

$$\begin{array}{l} v - w + x - y + z = 0 \\ 2v - w + 3x + y - 3z = 0 \\ v + 4w + 5x - 3y - 3z = 0 \\ 4v - 2w - x - 2y + 3z = 0 \\ 3v + w - 2x - 3y + 3z = 1 \end{array}$$

Besser untereinander schreiben:

$$\begin{array}{l} (1) \\ (2) \\ (3) \\ (4) \\ (5) \end{array} \left| \begin{array}{l} v - w + x - y + z = 0 \\ 2v - w + 3x + y - 3z = 0 \\ v + 4w + 5x - 3y - 3z = 0 \\ 4v - 2w - x - 2y + 3z = 0 \\ 3v + w - 2x - 3y + 3z = 1 \end{array} \right. \begin{array}{l} \longrightarrow \\ \\ \\ \\ \end{array} \begin{array}{l} \\ \\ 4 - 4 + 9 - y - 15 = 0 \\ \\ \end{array} \Rightarrow \mathbf{y = 6}$$

y eliminieren:

$$\begin{array}{l} (1) + (2) \rightarrow (6) \\ 3 \cdot (2) + (3) \rightarrow (7) \\ 2 \cdot (2) + (4) \rightarrow (8) \\ (3) - (5) \rightarrow (9) \end{array} \left| \begin{array}{l} 3v - 2w + 4x - 2z = 0 \\ 7v + w + 14x - 12z = 0 \\ 8v - 4w + 5x - 3z = 0 \\ -2v + 3w + 7x - 6z = -1 \end{array} \right. \begin{array}{l} \longrightarrow \\ \\ \\ \end{array} \begin{array}{l} \\ \\ 14 + w + 42 - 60 = 0 \\ \\ \end{array} \Rightarrow \mathbf{w = 4}$$

w eliminieren:

$$\begin{array}{l} (6) + 2 \cdot (7) \rightarrow (10) \\ 3 \cdot (7) - (9) \rightarrow (11) \\ (8) - 2 \cdot (6) \rightarrow (12) \end{array} \left| \begin{array}{l} 17v + 32x - 26z = 0 \\ 23v + 35x - 30z = 1 \\ 2v - 3x + z = 0 \end{array} \right. \begin{array}{l} \longrightarrow \\ \\ \end{array} \begin{array}{l} \\ \\ 4 - 9 + z = 0 \end{array} \Rightarrow \mathbf{z = 5}$$

z eliminieren:

$$\begin{array}{l} (10) + 26 \cdot (12) \rightarrow (13) \\ (11) + 30 \cdot (12) \rightarrow (14) \end{array} \left| \begin{array}{l} 69v - 46x = 0 \\ 83v - 55x = 1 \end{array} \right. \begin{array}{l} \longrightarrow \\ \end{array} \begin{array}{l} 138 - 46x = 0 \\ \end{array} \Rightarrow \mathbf{x = 3}$$

x eliminieren:

$$55 \cdot (13) - 46 \cdot (14) \rightarrow (15) \quad \left| \begin{array}{l} -23v = -46 \end{array} \right. \longrightarrow \mathbf{v = 2}$$

Ausrechnung der Gleichungen auf der Rückseite!

| | | |
|------|-------------------|---|
| (6) | (1)+(2) | $\begin{array}{r} v - w + x - y + z = 0 \\ 2v - w + 3x + y - 3z = 0 \\ \hline 3v - 2w + 4x \quad - 2z = 0 \end{array}$ |
| (7) | 3·(2)+(3) | $\begin{array}{r} 6v - 3w + 9x + 3y + 9z = 0 \\ v + 4w + 5x - 3y - 3z = 0 \\ \hline 7v + w + 14x \quad - 12z = 0 \end{array}$ |
| (8) | 2·(2)+(4) | $\begin{array}{r} 4v - 2w + 6x + 3y - 6z = 0 \\ 4v - 2w - x - 3y + 3z = 0 \\ \hline 8v + 4w + 5x \quad - 3z = 0 \end{array}$ |
| (9) | (3)+(5) | $\begin{array}{r} v + 4w + 5x - 3y - 3z = 0 \\ -3v - w + 2x + 3y - 3z = -1 \\ \hline -2v + 3w + 7x \quad - 6z = -1 \end{array}$ |
| (10) | (6)+2·(7) | $\begin{array}{r} 3v - 2w + 4x - 2z = 0 \\ 14v + 2w + 28x - 24z = 0 \\ \hline 17v \quad + 32x - 26z = 0 \end{array}$ |
| (11) | 3·(7) - (9) | $\begin{array}{r} 21v + 3w + 42x - 36z = 0 \\ 2v - 3w - 7x + 6z = 1 \\ \hline 23v \quad + 35x - 30z = 1 \end{array}$ |
| (12) | (8) - 2·(6) | $\begin{array}{r} 8v - 4w + 5x - 3z = 0 \\ -6v + 4w - 8x + 4z = 0 \\ \hline 2v \quad - 3x + z = 0 \end{array}$ |
| (13) | (10) - 26·(12) | $\begin{array}{r} 17v + 32x - 26z = 0 \\ 52v - 78x + 26z = 0 \\ \hline 69v - 46x \quad = 0 \end{array}$ |
| (14) | (11) + 30·(12) | $\begin{array}{r} 23v + 35x - 30z = 1 \\ 60v - 90x + 30z = 0 \\ \hline 83v - 55x \quad = 1 \end{array}$ |
| (13) | 55·(13) - 46·(14) | $\begin{array}{r} 3795v - 2530x = 0 \\ 3818v + 2530x = -46 \\ \hline -23v \quad = -46 \end{array}$ |

Benützen Sie jede Gleichung eines Systems mindestens einmal!