

S 218 Nr. 5

$$\begin{array}{l}
 \text{b)} \quad x_1 + x_2 + x_3 = 15 \\
 2x_1 - x_2 + 7x_3 = 50 \\
 3x_1 + 11x_2 - 9x_3 = 1 \\
 x_1 - x_2 + x_3 = 5
 \end{array}
 \left| \begin{array}{l} \cdot 2 \\ \cdot (-1) \end{array} \right.
 \left| \begin{array}{l} \cdot 3 \\ \cdot (-1) \end{array} \right.
 \left| \begin{array}{l} \cdot 1 \\ \cdot (-1) \end{array} \right.$$

$$\text{I} \quad x_1 + x_2 + x_3 = 15 \Rightarrow x_1 + 5 + 7 = 15 \Rightarrow \underline{x_1 = 3}$$

$$\text{II} \quad 3x_2 - 5x_3 = -20 \Rightarrow 3 \cdot 5 - 5x_3 = -20 \Rightarrow \underline{x_3 = 7}$$

$$\text{III} \quad -8x_2 + 12x_3 = 44$$

$$\text{IV} \quad 2x_2 = 10 \Rightarrow \underline{x_2 = 5}$$

Prüfen ob Gleichung III auch erfüllt wird.

$$-8 \cdot 5 + 12 \cdot 7 = 44 \text{ ist wahr} \Rightarrow \underline{\underline{\mathbb{L} = \{(3; 5; 7)\}}}$$

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$$\begin{array}{l}
 \text{c)} \quad 7x_1 + 11x_2 + 13x_3 = 0 \\
 x_1 - x_2 - x_3 = 1 \\
 2x_1 + 3x_2 + 4x_3 = 0 \\
 9x_1 - 10x_2 + 11x_3 = 0
 \end{array}
 \left| \begin{array}{l} \cdot (-1) \\ \cdot 7 \end{array} \right.
 \left| \begin{array}{l} \cdot 2 \\ \cdot (-1) \end{array} \right.
 \left| \begin{array}{l} \cdot 9 \\ \cdot (-1) \end{array} \right.$$

$$x_1 - x_2 - x_3 = 1$$

$$-18x_2 - 20x_3 = 7 \quad | \cdot 1$$

$$-5x_2 - 6x_3 = 2$$

$$x_2 - 20x_3 = 9 \quad | \cdot (-1)$$

$$x_1 - x_2 - x_3 = 1 \Rightarrow x_1 = \frac{2}{19} + \frac{8}{19} + 1 = \underline{\underline{\frac{13}{19}}}$$

$$-18x_2 - 20x_3 = 7$$

$$-5x_2 - 6x_3 = 2 \Rightarrow -6x_3 = 2 + 5 \cdot \frac{2}{19} \Rightarrow \underline{\underline{x_3 = -\frac{8}{19}}}$$

$$-19x_2 = -2 \Rightarrow \underline{\underline{x_2 = \frac{2}{19}}}$$

Gleichung II prüfen

$$-18 \cdot \frac{2}{19} - 20 \cdot \left(-\frac{8}{19}\right) = \frac{124}{19} \neq 7 \Rightarrow \underline{\underline{\mathbb{L} = \{ \}}}$$