

$$\begin{array}{l} \text{Nr. 3)} \\ \text{a)} \end{array} \quad \begin{array}{l} 3x_1 + 4x_2 + 2x_3 = 5 \\ 2x_1 - 3x_2 + x_3 = 8 \\ 2x_3 = 6 \end{array} \quad \begin{array}{l} | \cdot 2 \\ | \cdot (-3) \\ | \end{array}$$

$$3x_1 + 4x_2 + 2x_3 = 5 \Rightarrow 3x_1 = 5 + 4 \cdot 1 - 2 \cdot 3 \Rightarrow \underline{x_1 = 1}$$

$$17x_2 + 1x_3 = -14 \Rightarrow 17x_2 = -14 - 3 \Rightarrow \underline{x_2 = -1}$$

$$2x_3 = 6 \Rightarrow \underline{x_3 = 3}$$

$$\underline{\underline{\mathbb{L} = \{(1 | -1 | 3)\}}}$$

$$\begin{array}{l} \text{b)} \\ \text{c)} \end{array} \quad \begin{array}{l} 3x_1 + 2x_2 + 3x_3 = 9 \\ 4x_2 - 3x_3 = 6 \\ 2x_1 + 4x_2 = 10 \end{array} \quad \begin{array}{l} | \cdot 1 \\ | \cdot 1 \\ | \end{array}$$

$$\begin{array}{l} 3x_1 + 2x_2 + 3x_3 = 9 \\ 3x_1 + 6x_2 = 15 \\ 2x_1 + 4x_2 = 10 \end{array} \quad \begin{array}{l} | \\ | \cdot 2 \\ | \cdot (-3) \end{array}$$

$$3x_1 + 2x_2 + 3x_3 = 9 \Rightarrow 3x_3 = 9 - 2 \cdot t - 3 \cdot (5 - 2t) = -6 + 4t \Rightarrow x_3 = -2 + \frac{4}{3}t$$

$$3x_1 + 6x_2 = 15 \text{ wähle } x_2 = t \Rightarrow 3x_1 = 15 - 6t \Rightarrow \underline{x_1 = 5 - 2t}$$

$$0 \cdot x_1 + 0 \cdot x_2 = 0$$

$$\mathbb{L} = \left\{ \left(5 - 2t \mid t \mid -2 + \frac{4}{3}t \right) \mid t \in \mathbb{R} \right\} \quad \text{für } 3t^* = t$$

$$\Rightarrow \underline{\underline{\mathbb{L} = \left\{ \left(5 - 2 \cdot 3t^* \mid 3t^* \mid -2 + \frac{4}{3} \cdot 3t^* \right) \mid t^* \in \mathbb{R} \right\} = \left\{ \left(5 - 6t^* \mid 3t^* \mid -2 + 4t^* \right) \right\}}}$$

$$\begin{array}{l} \text{c)} \\ \text{d)} \end{array} \quad \begin{array}{l} 2x_1 - 3x_2 + 4x_3 = 1 \\ 3x_1 + 1x_2 - 5x_3 = 7 \\ 4x_1 + 5x_3 - 14x_3 = 13 \end{array} \quad \begin{array}{l} | \cdot 3 \\ | \cdot (-2) \\ | \end{array} \quad \begin{array}{l} | \cdot 2 \\ | \\ | \cdot (-1) \end{array}$$

$$\begin{array}{l} 2x_1 - 3x_2 + 4x_3 = 1 \\ -11x_2 + 22x_3 = -11 \\ -11x_2 + 22x_3 = -11 \end{array} \quad \begin{array}{l} | \cdot 1 \\ | \\ | \cdot (-1) \end{array}$$

$$\begin{array}{l} 2x_1 - 3x_2 + 4x_3 = 1 \\ -11x_2 + 22x_3 = -11 \\ 0 = 0 \end{array} \quad \begin{array}{l} | \\ | \cdot (-11) \\ | \end{array}$$

$$2x_1 - 3x_2 + 4x_3 = 1 \Rightarrow 2x_1 - 3 \cdot (1 + 2t) + 4 \cdot t = 1 \Rightarrow \underline{x_1 = 2 + 1t}$$

$$x_2 - 2x_3 = 1 \Rightarrow x_2 = 1 + 2x_3 \text{ wähle } \underline{x_3 = t} \Rightarrow \underline{x_2 = 1 + 2t}$$

$$0 = 0$$

$$\underline{\underline{\mathbb{L} = \{(2 + 1t \mid 1 + 2t \mid t) \mid t \in \mathbb{R}\}}}$$