

S 218 Nr. 9

a) $\mathcal{L} = \{(-2; 3; -4)\}$

$$\begin{array}{rcl|l} x_1 & = & -2 & \text{I} + \text{II} + \text{III} = \text{I}^* \\ & x_2 & = & 3 & \text{I} - \text{II} + \text{III} = \text{II}^* \\ & x_3 & = & -4 & \text{I} + \text{II} - \text{III} = \text{III}^* \end{array}$$

$$x_1 + x_2 + x_3 = -3$$

$$x_1 - x_2 + x_3 = -9$$

$$x_1 + x_2 - x_3 = 5$$

b) $\mathcal{L} = \{ \}$

$$x_1 + 8x_2 - 9x_3 = 5$$

$$\left. \begin{array}{l} x_1 + x_2 + x_3 = 2 \\ x_1 + x_2 + x_3 = 7 \end{array} \right\} \Rightarrow \text{II} - \text{III} \quad 0 \neq -5 \quad \text{⚡}$$

c) $\mathcal{L} = \{(t; 2t; 3t)\}$

$$\begin{array}{rcl|l} x_2 = 2x_1 & \Rightarrow & 2x_1 - x_2 & = & 0 \\ x_3 = 3x_1 & \Rightarrow & 3x_1 & - & x_3 = 0 \\ 0 = 0 & & 5x_1 - x_2 - x_3 & = & 0 \end{array} \quad \left| \begin{array}{l} \text{I}^* = \text{I} - \text{II} \\ \text{II}^* = \text{II} + \text{III} \\ \text{III}^* = \text{III} \end{array} \right.$$

$$-x_1 - x_2 + x_3 = 0$$

$$8x_1 - x_2 + 2x_3 = 0$$

$$5x_1 - x_2 - x_3 = 0$$

d) $\mathcal{L} = \{(5; t+1; t) \mid t \in \mathbb{R}\}$

$$\begin{array}{rcl|l} x_1 = 5 & \Rightarrow & x_1 & = & 5 \\ x_2 = x_3 + 1 & \Rightarrow & x_2 - x_3 & = & 1 \\ 0 = 0 & & x_1 + x_2 - x_3 & = & 6 \end{array} \quad \left| \begin{array}{l} \text{I}^* = \text{I} - \text{II} \\ \text{II}^* = \text{II} + \text{III} \\ \text{III}^* = \text{III} \end{array} \right.$$

$$x_1 - x_2 + x_3 = 4$$

$$x_1 + 2x_2 - 2x_3 = 7$$

$$x_1 + x_2 - x_3 = 6$$
