

Nr. 1) $2x_1 - 4x_2 - x_3 = 1 \Rightarrow 2x_1 - 4 \cdot 2 - 3 = 1 \Rightarrow x_1 = 6$

a) $5x_2 + 2x_3 = 16 \Rightarrow 5x_2 + 2 \cdot 3 = 16 \Rightarrow x_2 = 2$

$3x_3 = 9 \Rightarrow x_3 = 3$

$\mathbb{L} = \{(6|2|3)\}$

b) $12x_1 + 5x_2 - 3x_3 = 7$

$7x_2 - 3x_3 = 1$

$0 \cdot x_3 = -2 \Rightarrow \mathbb{L} = \{ \}$

c) $2x_1 - 4x_2 - x_3 = 2$

$3x_2 - 6x_3 = 6 \Rightarrow 3x_2 = 6 + 6x_3$ wähle $x_3 = t$

$0x_3 = 0 \checkmark$

$3x_2 = 6 + 6 \cdot t \Rightarrow x_2 = 2 + 2t$

$2x_1 - 4(2 + 2t) - t = 2 \Rightarrow 2x_1 - 8 - 8t - t = 2 \Rightarrow 2x_1 = 10 + 9t$
 $\Rightarrow x_1 = 5 + \frac{9}{2}t$ $\mathbb{L} = \{(5 + \frac{9}{2}t | 2 + 2t | t) | t \in \mathbb{R}\}$

Nr. 2) a) $2x_1 + x_2 + x_3 = 3$

$x_2 - x_3 = 1 \Rightarrow x_2 = 1 + x_3$ wähle $x_3 = t$

$\Rightarrow x_2 = 1 + t$; $2x_1 + 1 + t + t = 3 \Rightarrow 2x_1 = 2 - 2t \Rightarrow x_1 = 1 - t$

$\mathbb{L} = \{t \in \mathbb{R} | (1 - t | 1 + t | t)\}$

b)
$$\begin{array}{l|l} x_1 - 2x_2 - x_3 = 2 & \\ 2x_2 - 4x_3 = 1 & \cdot 3 \\ 3x_2 - 6x_3 = \frac{3}{2} & \cdot (-2) \end{array}$$

$x_1 - 2x_2 - x_3 = 2 \Rightarrow x_1 - 2(\frac{1}{2} + 2t) - t = 2 \Rightarrow x_1 = 3 + 4t + t = 3 + 5t$

$2x_2 - 4x_3 = 1 \Rightarrow 2x_2 = 1 + 4t \Rightarrow x_2 = \frac{1}{2} + 2t$

$0 = 0$ wähle $x_3 = t$

$\mathbb{L} = \{(3 + 5t | \frac{1}{2} + 2t | t) | t \in \mathbb{R}\}$

c) $x_1 - 2x_2 + 4x_3 = 4$ wähle $x_3 = t \Rightarrow x_1 - 2x_2 + 4t = 4 \Rightarrow -2x_2 = -4t$
 $x_1 = 4$ $x_2 = 2t$

$\mathbb{L} = \{(4 | 2t | t) | t \in \mathbb{R}\}$