

6)

$$\begin{array}{cccc|l} k & 1 & 1 & 1 & \\ 1 & k & 4 & 1 & \\ -\frac{4}{k-1} & -\frac{4}{k-1} & -\frac{4}{k-1} & -\frac{4}{k-1} & | \cdot (-4) \\ -1 & -1 & -1 & -1 & | \cdot (-1) \end{array}$$

$$\begin{array}{cccc|l} (k-1) & 0 & 0 & 0 & \Rightarrow (k-1)x_1 = 0 \\ -3 & k-4 & 0 & -3 & \\ 1 & 1 & 1 & 1 & \end{array}$$

1. Fall $k=1$: $0x_1 = 0$; ∞ viele Lsgen ; $x_1 = \alpha$

II : $-3x_1 + (1-4)x_2 = -3 \Leftrightarrow -3x_1 - 3x_2 = -3 \quad | :3$
 $\Rightarrow x_2 = 1 - x_1 = 1 - \alpha$

III : $x_1 + x_2 + x_3 = 1 \Leftrightarrow x_3 = 1 - x_2 - x_1 = 1 - (1 - \alpha) - \alpha = 0$

$L = \{ (\alpha \mid 1 - \alpha \mid 0) \}$ für $k=1$

2. Fall : $k \neq 1$

III : $(k-1)x_1 = 0 \Leftrightarrow x_1 = 0$

II : $-3 \cdot 0 + (k-4)x_2 = -3 \Leftrightarrow (k-4)x_2 = -3 \quad | : (k-4)$

3. Fall : $k=4$

$0x_2 = -3 \quad \frac{1}{2} \Rightarrow L = \{ \}$

4. Fall $k \neq 4$

$x_2 = -\frac{3}{k-4}$

$x_3 = 1 - x_2 - x_1 = 1 - (-\frac{3}{k-4}) - 0 = \frac{k-4}{k-4} + \frac{3}{k-4} = \frac{k-1}{k-4}$

$L = \{ (0 \mid \frac{3}{4-k} \mid \frac{k-1}{k-4}) \}$ für $k \in \mathbb{R} \setminus \{1; 4\}$