

Lösungen LGS 2

$$\begin{array}{l}
 \text{I} \quad 4x - 2y + 3z = 8 \\
 \text{II} \quad x - 5y - z = 12 \\
 \text{III} \quad x + 2z = 3
 \end{array}
 \quad
 \begin{array}{l}
 \text{I} \cdot 5 + \text{II} \cdot (-2) \Rightarrow \text{IV} \quad 18x + 17z = 16 \\
 \text{III} \cdot (-18) + \text{IV} \Rightarrow \text{L} = \{(-1; -3; 2)\}
 \end{array}$$

$$\begin{array}{l}
 \text{I} \quad x - 2y = -3 \\
 \text{II} \quad 3x - 2z = 7 \\
 \text{III} \quad 2y + z = -3
 \end{array}
 \quad
 \begin{array}{l}
 \text{I} + \text{III} \Rightarrow \text{IV} \quad x + z = -6 \\
 \text{II} + \text{IV} \cdot 2 \Rightarrow \text{L} = \{(-1; 1; -5)\}
 \end{array}$$

$$\begin{array}{l}
 \text{I} \quad 3x - 5y - z = 7 \\
 \text{II} \quad 2x - 3y + 2z = -6 \\
 \text{III} \quad 7x + 8y + z = 3
 \end{array}
 \quad
 \begin{array}{l}
 \text{I} + \text{III} \Rightarrow \text{IV} \quad 10x + 3y = 10 \quad \text{und} \quad \text{I} \cdot 2 + \text{II} \Rightarrow \text{V} \quad 8x - 13y = 8 \\
 \text{IV} \cdot 4 + \text{V} \cdot (-5) \Rightarrow \text{L} = \{(1; 0; -4)\}
 \end{array}$$

$$\begin{array}{l}
 \text{I} \quad 3a + 5b - c = 2 \\
 \text{II} \quad 2a - 3b + 2c = -2 \\
 \text{III} \quad 7a + 8b + c = -8
 \end{array}
 \quad
 \begin{array}{l}
 \text{I} + \text{III} \Rightarrow \text{IV} \quad 10a + 13b = -6 \quad \text{und} \quad \text{I} \cdot 2 + \text{II} \Rightarrow \text{V} \quad 8a + 7b = 2 \\
 \text{IV} \cdot 4 + \text{V} \cdot (-5) \Rightarrow \text{L} = \{(2; -2; -6)\}
 \end{array}$$

$$\begin{array}{l}
 \text{I} \quad a - 2b = -2 \\
 \text{II} \quad 3a - 2c = 12 \\
 \text{III} \quad 2b + c = 6
 \end{array}
 \quad
 \begin{array}{l}
 \text{I} + \text{III} \Rightarrow \text{IV} \quad a + c = 4 \\
 \text{II} + \text{IV} \cdot 2 \Rightarrow \text{L} = \{(4; 3; 0)\}
 \end{array}$$

$$\begin{array}{l}
 \text{I} \quad 2a - 3b + 4c = 9 \\
 \text{II} \quad -4a + 2b + 6c = -2 \\
 \text{III} \quad 7a - 8b = 11
 \end{array}
 \quad
 \begin{array}{l}
 \text{I} \cdot 3 + \text{II} \cdot (-2) \Rightarrow \text{IV} \quad 14a - 13b = 31 \\
 \text{III} \cdot (-2) + \text{IV} \Rightarrow \text{L} = \{(5; 3; 2)\}
 \end{array}$$

$$\begin{array}{l}
 \text{I} \quad a + b + c + d = 0 \\
 \text{II} \quad 2a - 3b - 2c + d = -1 \\
 \text{III} \quad -a + 4b + c - d = 7 \\
 \text{IV} \quad 3a - 2b - 3c - 3d = -3
 \end{array}
 \quad
 \begin{array}{l}
 \text{I} + \text{III} \Rightarrow \text{V} \quad 5b + 2c = 7 \quad \text{und} \\
 \text{II} + \text{III} \Rightarrow \text{VI} \quad a + b - c = 6 \quad \text{und} \quad \text{I} \cdot 3 + \text{IV} \Rightarrow \text{VII} \quad 6a + b = -3 \\
 \text{V} \quad 5b + 2c = 7 \\
 \text{VI} \quad a + b - c = 6 \\
 \text{VII} \quad 6a + b = -3
 \end{array}
 \quad
 \begin{array}{l}
 \text{V} + \text{VI} \cdot 2 \Rightarrow \text{VIII} \quad 2a + 7b = 19 \\
 \text{VII} + \text{VIII} \cdot (-3) \Rightarrow \text{L} = \{(-1; 3; -4; 2)\}
 \end{array}$$

$$\begin{array}{l}
 \text{I} \quad 3a + b - 4c + d = 0 \\
 \text{II} \quad 2a - 2b + 6c + 7d = -7 \\
 \text{III} \quad -a + b + 3c - 2d = 5 \\
 \text{IV} \quad 5a + 2b - 5c + 3d = 3 \\
 \text{V} \quad 8a - 2c + 9d = -7 \\
 \text{VI} \quad 12c + 3d = 3 \\
 \text{VII} \quad 7a + c + 10d = -4
 \end{array}
 \quad
 \begin{array}{l}
 \text{I} \cdot 2 + \text{II} \Rightarrow \text{V} \quad 8a - 2c + 9d = -7 \text{ und} \\
 \text{II} + \text{III} \cdot 2 \Rightarrow \text{VI} \quad 12c + 3d = 3 \text{ und} \\
 \text{II} + \text{IV} \Rightarrow \text{VII} \quad 7a + c + 10d = -4 \\
 \text{V} \cdot (-7) + \text{VII} \cdot 8 \Rightarrow \text{VIII} \quad 22c + 17d = 17 \\
 \text{VI} \cdot 17 + \text{VIII} \cdot (-3) \Rightarrow \text{L} = \{(-2; 5; 0; 1)\}
 \end{array}$$

Aufgabe 9

x = Krokodile

y = Schlangen

z = Spinnen

Köpfe, Beine, Schwänze

$$\begin{array}{ll}
 \text{I} \quad x + y + z = 15 \\
 \text{II} \quad 4x + 8z = 76 \\
 \text{III} \quad x + y = 8
 \end{array}
 \quad
 \begin{array}{l}
 \text{I} + \text{III} \cdot (-1) \Rightarrow z = 7; x = 5; y = 3
 \end{array}$$

Es gibt 5 Krokodile, 3 Schlangen und 7 Spinnen auf der Farm.

Aufgabe 10

x = 4er-Tische

y = 6er-Tische

z = 8er-Tische

Anzahl, Personen, Kosten

$$\begin{array}{ll}
 \text{I} \quad x + y + z = 60 \\
 \text{II} \quad 4x + 6y + 8z = 380 \\
 \text{III} \quad 500x + 700y + 1000z = 46000 | :100
 \end{array}
 \quad
 \begin{array}{l}
 \text{I} \cdot (-4) + \text{II} \Rightarrow \text{IV} \quad 2y + 4z = 140 \text{ und} \\
 \text{I} \cdot (-5) + \text{III} \Rightarrow \text{V} \quad 2y + 5z = 160 \\
 \text{IV} \cdot (-1) + \text{V} \Rightarrow z = 20; y = 30; x = 10
 \end{array}$$

Es wurden 10 4er-Tische, 30 6er-Tische und 20 8er-Tische hergestellt.

Aufgabe 11

x = Zweisitzer

y = Fünfsitzer

z = Siebensitzer

Anzahl, Personen, Werkstattbesuche

$$\begin{array}{ll}
 \text{I} \quad x + y + z = 100 \\
 \text{II} \quad 2x + 5y + 7z = 483 \\
 \text{III} \quad 4x + 3y + z = 291
 \end{array}
 \quad
 \begin{array}{l}
 \text{I} \cdot (-2) + \text{II} \Rightarrow \text{IV} \quad 3y + 5z = 283 \text{ und} \\
 \text{I} \cdot (-4) + \text{III} \Rightarrow \text{V} \quad -y - 3z = -109 \\
 \text{IV} + \text{V} \cdot 3 \Rightarrow z = 11; y = 76; x = 13
 \end{array}$$

Es waren 13 Zweisitzer, 76 Fünfsitzer und 11 Siebensitzer.