

Aufgabe 1)

a)

$$\left( \begin{array}{ccc|c} 20 & 30 & 10 & 5200 \\ 10 & 17 & 6 & 3000 \\ 20 & 3 & 2 & 0760 \end{array} \right)$$

$$\left( \begin{array}{ccc|c} 20 & 30 & 10 & 5200 \\ 0 & 1 & 2 & 800 \\ 0 & 0 & 10 & -2400 \end{array} \right)$$

$$\left( \begin{array}{ccc|c} 20 & 30 & 10 & 5200 \\ 0 & 1 & 0 & 1040 \\ 0 & 0 & 1 & -240 \end{array} \right)$$

$$\left( \begin{array}{ccc|c} 20 & 30 & 0 & 5600 \\ 0 & 1 & 0 & 260 \\ 0 & 0 & 1 & -240 \end{array} \right)$$

$$\left( \begin{array}{ccc|c} 20 & 0 & 0 & -200 \\ 0 & 1 & 0 & 260 \\ 0 & 0 & 1 & -240 \end{array} \right)$$

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$$\left( \begin{array}{ccc|c} 1 & 0 & 0 & -1 \\ 0 & 1 & 0 & 260 \\ 0 & 0 & 1 & -240 \end{array} \right)$$

Für  $\mathbf{H}$

b)

$$\begin{array}{l} \text{10/20} \\ \text{2/20} \end{array} \left( \begin{array}{ccc} 20 & 30 & 10 \\ 10 & 17 & 6 \\ 2 & 3 & 2 \end{array} \right) \Rightarrow \left( \begin{array}{ccc} 20 & 30 & 10 \\ 0 & 2 & 1 \\ 0 & 0 & 1 \end{array} \right) \Rightarrow \left( \begin{array}{ccc} 2 & 3 & 1 \\ 0 & 2 & 1 \\ 0 & 0 & 1 \end{array} \right) R$$

$$L \left( \begin{array}{ccc} 0 & 0 & 0 \\ 1/2 & 0 & 0 \\ 1/10 & 0 & 0 \end{array} \right)$$

$$L \circ \mathbf{z} = \mathbf{b}$$

$$\mathbf{b} = \begin{pmatrix} 5,720 \\ 3,3 \\ 0,836 \end{pmatrix}$$

$$\begin{array}{ccc|c} 1 & 0 & 0 & z_1 \\ 1/2 & 1 & 0 & z_{11} \\ 1/10 & 0 & 1 & z_{111} \end{array} = \begin{array}{c} 5,720 \\ 3,3 \\ 0,836 \end{array}$$

$$z_1 = 5,72$$

$$z_2 = 3,3 - 2,86 = 0,44$$

$$z_3 = 0,836 - (5,72) \cdot 1/10 = 0,264$$

$$\begin{array}{ccc|c} 2 & 3 & 1 & x_1 \\ 0 & 2 & 1 & x_2 \\ 0 & 0 & 1 & x_3 \end{array} \cdot \begin{pmatrix} x_1 \\ x_2 \\ x_3 \end{pmatrix} = \begin{pmatrix} 5,72 \\ 0,44 \\ 0,264 \end{pmatrix}$$

$$2,596$$

$$0,088$$

$$\underline{0,264}$$

$$x_3 = 0,264$$

$$x_2 = (0,44 - 0,264)/2 = 0,088$$

$$x_1 = \frac{(5,72 - 0,264 - 3,00)}{2}$$

$$= 2,596$$