3)   a)   Solution: $x = -1$ $y = 3$ $z = -2$

Possible steps:

$$\begin{cases} x + 4y - 5z = 21 & \text{[1]} \\ 2x + 3y + 4z = -1 & \text{[2]} \\ x - 6y - 8z = -3 & \text{[3]} \end{cases}$$

$$\begin{array}{lll} (-2)\cdot[1]+[2] & \rightarrow & -5y + 14z = -43 \\ (-1)\cdot[1]+[3] & \rightarrow & -10y - 3z = -24 \end{array} \begin{array}{l} \cdot(-2)+ \\ + \end{array} \rightarrow \quad -31z = 62 \quad \rightarrow \quad z = -2$$

y and x by backward substitution.

b)   Lösung: $x = -11$ $y = -2$ $z = -4$

Possible steps:

$$\begin{cases} 3x + 2y - 8z = -5 & \text{[1]} \\ -x \qquad + 2z = 3 & \text{[2]} \\ x + y - 5z = 7 & \text{[3]} \end{cases}$$

$$\begin{array}{lll} [1] + (-2)\cdot[3] & \rightarrow & x + 2z = -19 \\ [2] \text{ übernehmen} & \rightarrow & -x + 2z = 3 \end{array} \begin{array}{l} + \\ + \end{array} \rightarrow \quad z = -16 \quad \rightarrow \quad z = -4$$

x and y by backward substitution.