

Problem 1 Solve the following system:

$$\begin{aligned}x_1 + x_2 + 2x_3 + 3x_4 &= 0 \\2x_1 + 3x_2 + 4x_3 + 6x_4 &= 0 \\3x_1 + 4x_2 + 6x_3 + 9x_4 &= 0\end{aligned}$$

Solution: The free variables are x_3 and x_4 .
The general solution is:

$$\mathbf{x} = x_3 \begin{bmatrix} -2 \\ 0 \\ 1 \\ 0 \end{bmatrix} + x_4 \begin{bmatrix} -3 \\ 0 \\ 0 \\ 1 \end{bmatrix}$$

Problem 1 Solve the following system:

$$\begin{aligned}x_1 + 3x_2 + x_3 + 2x_4 &= 0 \\2x_1 + 5x_2 + 3x_3 + 3x_4 &= 0 \\2x_1 + 6x_2 + 2x_3 + x_4 &= 0\end{aligned}$$

Solution: There is only one free variable x_3 .
The general solution is:

$$\mathbf{x} = x_3 \begin{bmatrix} -4 \\ 1 \\ 1 \\ 0 \end{bmatrix}$$