

37233 LINEAR ALGEBRA

Exercises 2

Question 1

Find a set of vectors which describes the solutions of the homogeneous system

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

Question 2

By finding a general solution to the corresponding homogeneous system and a particular solution to the inhomogeneous system, construct the general solution to the system

$$\begin{aligned}x_1 + x_2 - x_3 - 2x_4 &= 1 \\2x_1 - x_2 - 3x_3 - 5x_4 &= 7 \\x_1 + 2x_2 - 6x_3 - 7x_4 &= -6\end{aligned}$$

If further training is desired:

Question 3

Find all solutions to the linear system $\mathbf{Ax} = \mathbf{0}$ with $\mathbf{A} = \begin{bmatrix} 1 & 0 & 2 & 0 & -1 \\ 0 & 1 & 0 & 0 & 5 \\ 3 & 3 & 6 & 1 & 14 \\ 0 & -1 & 0 & -2 & -9 \end{bmatrix}$