
Homework 9

Exercise 1 *In each of the following cases find a row equivalent matrix in the standard form.*

$$a)\ \begin{pmatrix} 6 & 3 & -4 \\ -4 & 1 & -6 \\ 1 & 2 & -5 \end{pmatrix} \quad b)\ \begin{pmatrix} 1 & 0 & 2 \\ 2 & -1 & 3 \\ 4 & 1 & 8 \end{pmatrix} \quad c)\ \begin{pmatrix} 0 & 1 & 3 & -2 \\ 2 & 1 & -4 & 3 \\ 2 & 3 & 2 & -1 \end{pmatrix} \quad d)\ \begin{pmatrix} 1 & 2 & -1 & 2 & 1 \\ 2 & 4 & 1 & -2 & 3 \\ 3 & 6 & 2 & -6 & 5 \end{pmatrix}$$

Exercise 2 *By using Gauss elimination, find all solution for the following systems :*

$$a) \qquad \begin{aligned} x + y - 2z &= 5 \\ 2x + 3y + 4z &= 2 \end{aligned}$$

$$b) \qquad \begin{aligned} x_3 + x_4 &= 0 \\ x_2 + x_3 &= 0 \\ x_1 + x_2 &= 0 \\ x_1 + x_4 &= 0 \end{aligned}$$

$$c) \qquad \begin{aligned} x_1 + 2x_2 + 2x_4 + 3x_5 &= 0 \\ x_3 + 3x_4 + 2x_5 &= 0 \\ x_3 + 4x_4 - x_5 &= 0 \\ x_5 &= 0 \end{aligned}$$

Exercise 3 *Find a polynomial of degree* 3 *whose graph goes through the points* $(0, -1)$, $(1, -1)$, $(-1, -5)$ *and* $(2, 1)$.

Exercise 4 *Consider the equation*

$$\begin{aligned} x + 2y + 3z &= 4 \\ x + ky + 4z &= 6 \\ x + 2y + (k+2)z &= 6 \end{aligned}$$

where k *is an arbitrary constant.*

1. *For which values of* k *does this system have a unique solution ?*
2. *When is there no solution ?*
3. *When are there infinitely many solutions ?*