

Assignment 2

Due Friday, September 30, before the lecture in the class

For each of the following matrices apply elementary row operations to find the reduced echelon form.

1.
$$\begin{bmatrix} 1 & 1 & 1 \\ 1 & 1 & 0 \\ 2 & 1 & 1 \end{bmatrix}$$

2.
$$\begin{bmatrix} 1 & 1 & 1 & 0 \\ -1 & -1 & 0 & 2 \\ 1 & 1 & 1 & 0 \end{bmatrix}$$

3.
$$\begin{bmatrix} 1 & 0 & 0 & 0 \\ 1 & 1 & 0 & 0 \\ 2 & 0 & 1 & 0 \\ 3 & 1 & 1 & 1 \end{bmatrix}$$

4.
$$\begin{bmatrix} 1 & 3 & 5 & 7 \\ 2 & 4 & 6 & 8 \\ 3 & 5 & 7 & 9 \end{bmatrix}$$

Find the general solutions of the systems whose augmented matrices are given below:

5.
$$\left[\begin{array}{cccc|c} 1 & 0 & 0 & 0 & 0 \\ 1 & 1 & 0 & 0 & 0 \\ 2 & 0 & 1 & 0 & 0 \\ 3 & 1 & 1 & 1 & 0 \end{array} \right]$$

6.
$$\left[\begin{array}{ccc|c} 1 & 3 & 5 & 7 \\ 2 & 4 & 6 & 8 \\ 3 & 5 & 7 & 9 \end{array} \right]$$

Solve the following system of equations:

7.
$$\begin{aligned} x^2 + y^2 - z^2 &= 1 \\ 3x^2 - 3y^2 + z^2 &= 1 \\ 2x^2 + y^2 - z^2 &= 2 \\ x + y + z + w &= 10 \end{aligned}$$

8.
$$\begin{aligned} 3x + y - 4z &= 0 \\ 2x - 3y + z &= 0 \\ 7x - 5y - 2z &= 0 \\ x^2 + y^2 + 2z^2 &= 16 \end{aligned}$$