

**Department of Pure Mathematics**  
**MODULE 110PMA207 – LINEAR ALGEBRA**  
**ASSIGNMENT 7**

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1. Plot the pairs  $(x, y)$  which satisfy the equation

$$-2x + 5y = 10$$

2. Solve the linear equations

$$\begin{aligned} \text{(a)} \quad 2x + 2y &= 2 \\ -2x - 4y &= 8 \end{aligned}$$

$$\begin{aligned} \text{(b)} \quad y &= x - 1 \\ y &= -2x + 5 \end{aligned}$$

numerically as well as geometrically.

3. How many solutions has the following system of equations?

$$\begin{aligned} -3x - 9y + 6z &= 12 \\ x + 3y - 2z &= 4 \end{aligned}$$

4. Find all solution to the following system of equations:

$$\begin{aligned} x_1 + x_2 + x_3 + x_4 &= 1 \\ x_1 + 2x_2 + 4x_3 + 8x_4 &= -1 \\ x_1 + 3x_2 + 9x_3 + 27x_4 &= -1 \\ x_1 + 4x_2 + 16x_3 + 64x_4 &= 1 \end{aligned}$$

5. Find all solution to the following system of equations:

$$\begin{aligned} x_1 + 2x_2 + 3x_3 + 4x_4 &= 4 \\ 2x_1 + 3x_2 + 4x_3 + x_4 &= -12 \\ 2x_1 + x_2 + 2x_3 + 5x_4 &= 16 \\ 4x_1 + x_2 + 2x_3 + 3x_4 &= 12 \end{aligned}$$

*Hint:* Notice that the rank of the corresponding matrix is 3 (which implies that the solution cannot be unique).