

HOMEWORK 6 - MATH 111

DUE DATE: Monday, November 8

INSTRUCTOR: George Voutsadakis

Read each problem very carefully before starting to solve it. Each question is worth 1 point. It is necessary to show your work. Correct answers without explanations are worth 0 points.

GOOD LUCK!!

1. Solve the following system by **substitution**:

$$\begin{cases} 4x - 3y = -1 \\ x + 2y = 17 \end{cases}$$

2. (a) Find the equation of the straight line through $(1, 2)$ and $(3, 4)$.

(b) Find the equation of the line through $(-1, 1)$ with slope 3.

(c) Find a point lying on both lines in (a) and (b).

3. Use the Gauss-Jordan (augmented matrix) method to solve the system

$$\begin{cases} x + y + z = 0 \\ -x - 2y + z = -8 \\ 2x - y - z = 3 \end{cases}$$

4. Use the Gauss-Jordan (augmented matrix) method to solve the system

$$\begin{cases} y = x - 2 \\ y = 1 + z \\ z = 3 - x \end{cases}$$

5. Use the Gauss-Jordan (augmented matrix) method to solve the system

$$\begin{cases} 4x + 3y + z = 1 \\ -2x - y + 2z = 0 \end{cases}$$

6. Let $A = \begin{bmatrix} 2 & -7 \\ -1 & 5 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & 1 \\ -8 & 11 \end{bmatrix}$. Calculate $A + B$ and $2A - 3B$.

7. Let $A = \begin{bmatrix} 2 \\ -1 \\ 3 \end{bmatrix}$ and $B = \begin{bmatrix} 1 \\ -8 \\ -5 \end{bmatrix}$. First, calculate $A - 2B$. Then find a matrix X such that $B - 2x + 3A = 0$.

8. Solve the matrix equation $3X + 2 \begin{bmatrix} -2 & 5 \\ -1 & -7 \end{bmatrix} = \begin{bmatrix} 7 & -1 \\ 2 & 9 \end{bmatrix}$.