

HOMEWORK 7 - MATH 111

DUE DATE: Monday, March 29

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

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

7. Calculate the product

$$\begin{bmatrix} 1 & 0 & -2 \\ 3 & 2 & -1 \\ -2 & 0 & 5 \end{bmatrix} \begin{bmatrix} -1 & 4 \\ 0 & -2 \\ 3 & 5 \end{bmatrix}$$

8. Find the inverse matrix, if it exists, of the matrix $A = \begin{bmatrix} 5 & 0 & 2 \\ 2 & 2 & 1 \\ -3 & 1 & -1 \end{bmatrix}$.