HOMEWORK 8 - MATH 111

DUE DATE: Monday, April 5

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. Compute the product $\begin{bmatrix} 1 & 5 & -2 & 3 \\ 0 & -1 & 7 & 0 \end{bmatrix} \begin{bmatrix} 5 & 0 & 1 \\ -2 & 4 & -3 \\ 7 & 2 & -1 \\ 1 & -2 & 3 \end{bmatrix}$.

2. Compute the inverse matrix of $A = \begin{bmatrix} 1 & 2 & 3 \\ 1 & 1 & 2 \\ 0 & 1 & 2 \end{bmatrix}$.

3. Solve the matrix equation $\begin{bmatrix} 2 & -1 \\ 5 & 3 \end{bmatrix} X + \begin{bmatrix} 3 \\ -9 \end{bmatrix} = \begin{bmatrix} 12 \\ -17 \end{bmatrix}$.

4. Find x, y if you know that the matrix $X = \begin{bmatrix} x & 0 \\ 0 & y \end{bmatrix}$ satisfies the equation

$$X^2 = 2X + \begin{bmatrix} -4 & 0 \\ 0 & 15 \end{bmatrix}.$$

5. Use matrix algebra to solve for X the equation $A = BX + X$, where $A = \begin{bmatrix} 4 & 6 \\ -2 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} -2 & -2 \\ 3 & 3 \end{bmatrix}$.

6. Find the production matrix given the following input-output and production matrices: $A = \begin{bmatrix} 0.1 & 0.5 & 0 \\ 0 & 0.3 & 0.4 \\ 0.1 & 0.2 & 0.1 \end{bmatrix}, D = \begin{bmatrix} 10 \\ 4 \\ 2 \end{bmatrix}$.

7. Let the universe $U = \{0, 1, 2, 3, 4, 5, 6, 7\}$ and consider in U the sets $A = \{0, 2, 4, 5, 6, 7\}$ and $B = \{1, 3, 7\}$. Find A', $A \cap B$, $A \cup B$ and $A \cap (B' \cup A)$.

8. Let U be the set of all real numbers. Consider the subsets $A = (-3, 7]$ and $B = [-1, 10]$. Draw A and B on the real line. Then find $A \cap B$, $A \cup B$ and $A \cap B'$.