Fall - 2024 MTH-501: Assignment

Assignment (covering Lecture No. 08 to 16) has been uploaded.

End Date: November 22 2024

Instructions:

- Upload your solved assignments properly through VULMS within the due date.
- No assignment will be accepted through emails or received after the due date
- Use Math Type or Equation Editor etc. for writing the mathematical symbols and equations.
- Plagiarism in the submitted assignment will lead to a zero grade.
- Please read (and follow) the complete instructions from the uploaded question file before solving/submitting your assignments.

Question: 1

Let $A = \begin{bmatrix} 1 & -5 & -7 \\ -3 & 7 & 5 \end{bmatrix} b = \begin{bmatrix} -2 \\ -2 \end{bmatrix}$, T is defined by $T(x) = Ax$. Find vector x whose image under T is b, and determined whether x is unique.

Question: 2

Let $L: R^3 \rightarrow R^3$ is the linear operator defined by $L\left(\begin{bmatrix} x \\ y \\ z \end{bmatrix}\right) = \begin{bmatrix} 3y - z \\ x + 4y + z \\ x - y + z \end{bmatrix}$.Find the standard matrix representing A and verify $L(x) = Ax$.

Question 3:

(a) verify that $A^2 = I$, when $A = \begin{bmatrix} 1 & 0 \\ 2 & -1 \end{bmatrix}$.

(b) Use partitioned matrices to show that $M^2 = I$, when $M = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 2 & -1 & 0 & 0 \\ 1 & 0 & -1 & 0 \\ 0 & 1 & -2 & 1 \end{bmatrix}$