MA 265 Lecture 33

Section 7.1 Eigenvalues and Eigenvectors

Let $L : V \to V$ be a linear transformation. L maps a vector $\mathbf{v}$ in V to another vector $L(\mathbf{v})$ in V.

Let $L : V \to V$ be a linear transformation. The number λ is called

Note that a linear transformation can be expressed in terms of a matrix:

Definition Let A be an $n \times n$ matrix.

Example 1. *Find the eigenvalues and the associated eigenvectors of the matrix A, where*

$$A = \begin{bmatrix} 1 & 1 \\ -2 & 4 \end{bmatrix}$$

Definition Let $A = [a_{ij}]$ be an $n \times n$ matrix.

Theorem Let A be an $n \times n$ matrix.

Example 2. *Let*

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

Find all eigenvalues and associated eigenvectors of A.