

MA 265 Lecture 35

Section 7.2 Diagonalization and Similar Matrices (contd)

Recall

- We say A and B are similar if
- We say A is diagonalizable if
- An $n \times n$ matrix A is diagonalizable if and only if
- If $D = P^{-1}AP$, how to find D and P ?

Example 1. Find a nonsingular matrix P such that $P^{-1}AP$ is a diagonal matrix.

$$A = \begin{bmatrix} 1 & 2 & 3 \\ 0 & 1 & 0 \\ 2 & 1 & 2 \end{bmatrix}$$

If an $n \times n$ matrix A has n distinct eigenvalues,

If all roots of the characteristic polynomial of A are not all distinct,

Example 2. *Determine if the matrix A is diagonalizable, where*

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

Example 3. Determine if the matrix A is diagonalizable, where

$$A = \begin{bmatrix} 0 & 0 & 0 \\ 0 & 1 & 0 \\ 1 & 0 & 1 \end{bmatrix}$$