MATH 121A Prep: Diagonalization

Facts to Know:

Diagonalizable: A matrix A is called diagonalizable if

An $n \times n$ matrix with n distinct eigenvalues is always diagonalizable.

Diagonalization Process:

1. Find all eigenvalues of A

2. Find an eigenvector corresponding to each eigenvalue

3. D has the eigenvalues down the diagonal

4. P has columns equal to the eigenvector corresponding to the eigenvalue in the same column of D

5. Invert P

Examples:

1. If $A = PDP^{-1}$, what is A^n?

2. Diagonalize the matrix $\begin{bmatrix} a & b - a \\ 0 & b \end{bmatrix}$.

3. Use the diagonalized form to calculate A^n.