

MATH 1080: Spring 2011

Final Exam Review Topics

Reviews for both Midterm I and Midterm II

PLUS

Chapters: V.24-29

Theory:

- Definition and properties of eigenvalues and eigenvectors of a matrix
- Definition and properties of characteristic polynomial
- Definition of matrix diagonalization
- Diagonalization of a symmetric matrix
- Schur factorization of a matrix
- Definition and properties of Rayleigh quotient
- Definition and properties of singular value decomposition

Methods

- Estimation of maximum eigenvalue by power iteration
- Estimation of an eigenvalue by inverse iteration and Rayleigh quotient iteration
- Iteration by QR algorithm
- Iteration by QR algorithm with shifts
- Computation of Schur factorization
- Computation of Hessenberg form by using Householder reflectors
- Computation of singular value decomposition (SVD)
- Determination of range, nullspace, rank, norm of a matrix by SVD