

Quick Review for Final Exam

Math 434/534

- Learn the following basic concepts very well (definitions, properties and examples) :Backward Stability, Ill-conditioning, Elementary Matrix, Householder matrix, QR Factorization, LU factorization, and SVD and Cholesky Factorization, Growth Factor, Strictly Diagonally Dominant Matrix, Backward Error, Diagonally Dominant Matrix.
- Learn the statements of the following Theorems (NO Proof, Just the Statements): Theorem 5.18 (Page 107), Theorem 6.4 and the paragraph following that Theorem on Page 131.
- Roundoff Property and Flop-Count of Householder's Method for QR Factorization on Page 193.
- Learn how to solve a linear system, and compute the determinant and inverse of a matrix using Gaussian Elimination (both with and without pivoting).
- Learn Cholesky Decomposition Algorithm and its Stability and Flop-Count.
- Numerical Difficulties of the Normal Equations Method on Page 253. Properties of SVD on Page 216 (Theorem 7.27).
- Learn and do an example of Power Method on Page 296.
- Learn and do an example of Basic QR Iteration method on Page 322 (Algorithm 9.6).
- Learn how to find Least-Squares Solutions using QR Factorization and SVD.
- Learn the Proof of Theorem 4.19 (Page 62), Proof of Part 2 of Theorem 8.2 on Page 240, and Proof of Theorem 7.27 on Page 216. Learn these SVD properties.
- Learn the flop-counts for Gaussian Elimination, Householder QR Factorization, and Computing Matrix Products with Householder Matrices (Page 185).