MAT-150: Linear Algebra
Final Summary

Thomas R. Cameron

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Abstract

This summary is intended to help guide you in a review process that is both edifying and promotes success on the final. We outline a list of topics along with corresponding books sections and assignments. This review is by no means comprehensive and you should consider it your responsibility to map out how all the topics in this course are interconnected. As one last piece of advice, be sure that you know definitions and major theorems.

i. Eigenvalues and Eigenvectors
   - Sections 5.1–5.4
   - EFYs 6–8
   - Homework 4
   - Lab 5

ii. Invariant Subspaces
   - EFYs 7–8
   - See slides and class notes from week 10.

iii. Orthogonal Decomposition
   - Sections 6.1–6.3
   - EFY 9
   - Homework 5
   - Lab 6

iv. Gram-Schmidt Process
   - Section 6.4
   - Homework and Lab from (iii).

v. Least-Squares Problem
   - Homework and Lab from (iii).
   - Note that your book covers this topic in Section 6.5, but computes the best approximation in a slightly different way. It would be a great review to do the examples in Section 6.5 the way we outlined in class, as was done in Homework 5 Other Problem 1. Also, do you recognize a connection to how they are solving the Least-Squares problem in Section 6.5 and another topic from the class?

vi. Spectral Theorem
   - Section 7.1 (also note the connections to Section 5.3)
   - Homework 6

vii. Quadratic Forms
   - Sections 7.2–7.3
   - Homework 6

viii. Singular Value Decomposition
   - Section 7.4
   - Lab 7