Math 322-001- Matrix Algebra
Post Exam 2 Review
Fall 2015

List of sections from textbook

- Chapter 5 - Sections 1-4
- Chapter 6 - Sections 1-6

List of important terms: (You should know the meaning of these and be prepared to state a definition)

- Chapter 5 - Eigenvectors; eigenvalues; eigenspace ; characteristic polynomial; diagonalization; multiplicity of eigenvalue
- Chapter 6 - Inner/dot product; length/norm; orthogonal vectors; orthogonal complement; orthogonal set; orthogonal basis; orthonormal basis; orthogonal matrix; normal equation; least squares solution; least squares line

List of procedures/algorithms you will be expected to know:

- Chapter 5 - Finding eigenvalues and eigenvectors; finding diagonalization
- Chapter 6 - Finding vector of norm 1 in same direction as $\mathbf{v}$; Gram-Schmidt process; finding least squares line for a data set

List of results or formulas you will be expected to know:

- Chapter 5 - Characteristic polynomial of 2×2 and 3×3; Theorem 5.3.5; Theorem 5.3.6; Theorem 5.3.7
- Chapter 6 - $R(A)^{\perp} = N(A)$; projection onto W, given an orthogonal basis for W; projection matrix given by $A(A^TA)^{-1}A^T$ if columns of A give a basis for W

Suggested problems from the text:

- **5.1:** 13, 15, 21, 31
- **5.2:** 7, 13, 15, 21
- **5.3:** 13, 17, 21, 25
- **5.4:** 5, 7, 13, 15
- **6.1:** 19, 23, 25, 31

- **6.2:** 9, 13, 15, 23
- **6.3:** 5, 7, 11, 21
- **6.4:** 7, 9, 11, 17
- **6.5:** 9, 11, 13, 17
- **6.6:** 1, 2, 3.