5: Eigenvalues, Eigenvectors, and Invariant Subspaces

(5.36): Definition of eigenspace.

(5.38): Sum of eigenspaces is a direct sum.

(5.41, 5.44): Conditions equivalent to diagonalizability.

(5C - Exercise 7, 9): More working with eigenspaces.

6: Inner Product Spaces

(6.3, 6.7): Definition and basic properties of inner product.

(6.8, 6.10): Definition and basic properties of norm.

(6.11, 6.12): Orthogonality.

(6.14): Orthogonal decomposition of u as a linear combination of v and a vector orthogonal to v.

(6.15, 6.18): Cauchy-Schwarz and triangle inequality.

(6A - Exercise 17, 18): Working with norms.

(Exercise 24, 25): Working with inner products.

(6.26): Orthonormal lists of vectors are linearly independent.

(6.30): Generic expressions for vectors over orthonormal bases.

(6.31): Gram-Schmidt Procedure- how to adapt vector lists into orthonormal lists.

(6.39, 6.42): Linear functionals & the Riesz Representation Theorem.

(6B - Exercise 5, 8): Working with Gram-Schmidt and Riesz Representation.

(6.45, 6.46, 6.47, 6.50, 6.51): Orthogonal complement definition and properties.

(6.53, 6.55): Orthogonal projection definition and properties.

(6.56, example 6.58): Minimization to subspaces.

(6C - Exercise 7, 8): Working with projections.

(Exercise 11, 12): Working with minimization.

10: Trace and Determinant

(10.9, 10.12, 10.13): Two definitions of trace.

(10.15, 10.16): Trace results.

(10A - Exercise 3, 4): Working with change-of-basis.

(Exercise 8, 9, 11, 13-16): Working with trace.

(10.20): Determinant definition.

(10.24, 10.36): Determinant properties.

(10.40, 10.41): More determinant properties.

(10B - Exercise 1, 2): Working with determinants.