

Test 2 Study Guide

You should be familiar with all of the theorems and homework problems in chapters 3 and 4. The following is a list of a few of the key concepts covered in chapters 3 and 4. The list is not a comprehensive list of everything you will be tested over.

Chapter 3

- Vector spaces and subspaces. Examples include:
 - R^n ,
 - $R^{n \times m}$,
 - P_n ,
 - $C[a, b]$,
 - the span of a set of vectors,
 - the row space, column space, and nullspace of a matrix,
 - the kernel of a linear transformation,
 - the image from a subspace in a linear transformation, the range of a linear transformation
- Linear combinations of vectors, the span of a set of vectors, spanning sets for a vector space.

- Linear independence and dependence.
- A basis for a vector space. Dimension of a vector space. The relationship between linearly independent sets of vectors and spanning sets of vectors.
- Coordinate vectors. Transition matrices.
- Rank and nullity of a matrix. The relationship between rank and nullity.

Chapter 4

- Linear transformations and operators. Examples include rotations, reflections, derivative, definite integral, and other examples given in section 4.1;
- The kernels, ranges, and images of a linear transformation;
- Matrices representing a linear transformation;
- Similar matrices and how they represent different coordinate systems.