Math 22 Review for Midterm 2

Just as for the first midterm, the exam will contain questions much like those from the homework. If you've been doing well there and understand your answers and the concepts behind them, you'll do well.

Vector Space Terminology/Concepts:
- vector space
- subspace
- linear span (of a set of vectors)
- column space of a matrix
- range of a linear transformation
- null space of a matrix
- kernel of a linear transformation
- row space of a matrix
- basis for a vector space
- basis for a subspace
- dimension
- column/row rank (of a matrix)
- The Rank Theorem (also called the Rank-Nullity Theorem)

Some practice problems (just to give an idea of what I expect you to know):
- 2.8/5,6,8–14,15–20,23–26,31–36
- 2.9/1–17
- 4.1/5–12,21,
- 4.2/1–24,25,26,29–33
- 4.3/1–10,13–16,21,22
- 4.5/1–20,27
- 4.6/1–16

Eigenvalue/Eigenvector Terminology/Concepts:
- eigenvalue
- eigenvector
- eigenspace
- characteristic polynomial
- characteristic equation

- algebraic multiplicity
- geometric multiplicity
- diagonalizable

Some practice problems:
- 5.1/1–18,23–27,33
- 5.2/1–20,24,25,27
- 5.3/1,2,5,6,7–20,21,22,23,24,27,28

Coordinate Systems/Change of Basis Terminology/Concepts:

- coordinates (with respect to a basis)
- isomorphism
- change of basis matrix

Some practice problems:
- 4.4/1–14
- 4.7/1–10, 20a