Math 24 Spring 2006 Quiz 2
Review Guide

Sections: 2.3 p. 92–93, 2.4, 2.5, 3.1, 3.2.

Some items to know:

(1) L_A, the left-multiplication transformation, and how to use the translation between it and A to prove things about either matrices or linear transformations.
(2) What it means to be invertible and when linear transformations are invertible; the fact that only square matrices can be invertible; the relationship between invertibility of linear transformations and matrices (via $[T]_\beta^\gamma$ and L_A).
(3) The definition of isomorphism and the fact that isomorphism of vector spaces is characterized by dimension; that the functions taking T to $[T]_\beta^\gamma$ and taking v to $[v]_\beta$ are isomorphisms.
(4) What it means for a diagram to commute, and the main example (Figure 2.2) of a useful diagram which does commute.
(5) What the change of coordinate matrix is and how it can make finding matrices for linear transformations easier.
(6) What it means for two matrices to be similar and the fact that when β and β' are two ordered bases for a space, $[T]_\beta$ and $[T]_{\beta'}$ are similar.
(7) What it means for a row/column operation or square matrix to be elementary and the connection between them. Do not bother to memorize which operations are "Type 1, 2, or 3."
(8) Rank for matrices; the fact that multiplication by an invertible matrix (in particular an elementary matrix or product of elementary matrices, which form all the invertible matrices) does not change rank.
(9) That the rank of any matrix is equal to the dimension of its column space, the dimension of its row space, and the rank of its transpose, and that the rank is bounded then by the smaller of the two dimensions of the matrix.
(10) How to use row and column operations to simplify a matrix to find its rank more easily.
(11) That rank can only decrease or stay constant when you compose transformations or multiply matrices, never increase.
(12) How to use an augmented matrix to find the inverse of a matrix (or determine it is noninvertible).