

MATH 311-504

Topics in Applied Mathematics

Lecture 3-14:

Review for the final exam (continued).

Topics for the final exam: Part I

- n -dimensional vectors, dot product, cross product.
- Elementary analytic geometry: lines and planes.
- Systems of linear equations: elementary operations, echelon and reduced form.
- Matrix algebra, inverse matrices.
- Determinants: explicit formulas for 2-by-2 and 3-by-3 matrices, row and column expansions, elementary row and column operations.

Topics for the final exam: Part II

- Vector spaces (vectors, matrices, polynomials, functional spaces).
- Bases and dimension.
- Linear mappings/transformations/operators.
- Subspaces. Image and null-space of a linear map.
- Matrix of a linear map relative to a basis.

Change of coordinates.

- Eigenvalues and eigenvectors. Characteristic polynomial of a matrix. Bases of eigenvectors (diagonalization).