

EXAM 1 Topics

§1.1-§3.2

- The definitions of all terms in the assigned sections of the text
- Understanding the relationship between systems of linear equations and matrices
- Solving a system of linear equations using matrix calculations without a calculator
 - By row reducing (Gaussian Elimination)
 - Using Cramer's rule
- Free variables vs. Dependent variables
- Geometric interpretations of solutions
- Algebraic manipulations on matrices
- The three types of Elementary matrices, and how they can be used to in calculations and proofs
- Finding inverses by hand and using them to solve systems of linear equations
- LU-decompositions
- Applications
- Using a calculator to make calculations on large matrices
- Finding determinants by hand
 - Using cofactor expansion
 - Using the elimination method
 - Calculating determinants to decide the invertibility of a matrix
- Knowing the properties of determinants
- Ability to make computations with unknown letters as well as numbers
- Cramer's rule
- Basic Proofs on topics that we have discussed in class
- Vector Spaces
 - The vector space axioms
 - Examples of vector spaces
 - Deriving basic results from the Axioms
- Subspaces
 - Identifying subspaces
 - Important Example: Nullspace
 - Spanning set for a Vector Space