

Write down the following definitions and theorems (by memory when possible).

1 Linear Algebra and Vector Spaces

Vector space:

Linear independence:

Basis:

Dimension:

Quotient vector space:

Linear transformation:

Null space:

Rank and nullity:

Minimal polynomial:

Characteristic polynomial:

Eigenvalues and eigenvectors:

Diagonalization and triangularization:

Jordan canonical form:

Inner product:

Bilinear form:

Spectral Theorem for symmetric matrices:

2 Groups

Group:

Lagrange's Theorem:

Symmetric group:

Dihedral group:

Group homomorphism:

Coset:

Quotient group:

Normal subgroup:

Isomorphism Theorems:

Group action:

Burnside's formula:

Sylow p -subgroup:

Sylow Theorems:

Semi-direct product:

Class equation:

Simple group:

Composition series:

Structure Theorem for finitely-generated abelian groups:

3 Rings and Modules

Ring:

Ideal:

Prime ideal:

Maximal ideal:

Ring homomorphism:

Quotient ring:

Isomorphism theorems:

Integral domain:

Euclidean domain:

PID:

UFD:

Gauss's Lemma for polynomials:

Irreducible polynomial:

Chinese Remainder Theorem:

Module:

Finitely-generated module:

Free module:

Torsion:

Tensor product:

Exact sequence:

Structure Theorem for modules over a PID:

4 Fields and Galois Theory

Field:

Characteristic:

Field homomorphism:

Field extension:

Algebraic extension:

Algebraic closure:

Splitting field:

Separable field:

Primitive element:

Galois extension:

Galois group:

Fundamental Theorem of Galois Theory:

Cyclotomic polynomial:

Primitive Element Theorem:

Solvable extension: