

# Index

- absolute value, 9.1.1
  - on the rationals, 9.2.2, 9.2.3
- AKLB* setup, 2.2.1
- algebraic integer, 1.1.1
- approximation theorem, 9.3.3
- archimedean absolute value, 9.1.1
- Artin symbol, 8.2.3
- Artin-Whaples, see approximation theorem
- Cauchy sequence, 9.4.1
- characteristic polynomial, 2.1.1
- class number, 5.3.7
- co-different, C4
- coherent sequence, 9.4.4
- completion of a field with an absolute value, 9.4.1
- conjugates of an element, 2.1.6
  - of a prime ideal, 8.1.4
- contraction of an ideal, 4.1.1
- cyclotomic extension, 2.1 Problem 2, 2.2 Problems 4,5, 6.2.2, Chapter 7 Intro, 8.3.1
  - polynomial, 7.1.1
- decomposition field, 8.2.7
  - group, 8.1.4
- Dedekind domain, 3.1.1
- Dedekind's lemma, 2.1.8, 2.3.4
- denominator of a fractional ideal, 3.2.4
- different, C4
- Dirichlet unit theorem, 6.2.1
- discrete valuation, 9.1.1
- discrete valuation ring, 4.1.6, 9.1.2, 9.1.4
- discriminant, 2.3.1, 7.1.7
- divides means contains, 3.3.5
- dual basis, 2.2.9, C2
- DVR, see discrete valuation ring
- embedding, canonical, 5.3.1
  - complex, 5.3.1
  - logarithmic, 6.1.2

- real, 5.3.1
- equation of integral dependence, 1.1.1
- equivalent absolute values, 9.1, Problem 3
- extension of absolute values, B1
- extension of an ideal, 4.1.1
- factoring of prime ideals in extensions, Chapter 4
- field discriminant, 2.3.7
- fractional ideal, 3.2.4
- Frobenius automorphism, 8.2.1
- fundamental domain, 5.1.1
- fundamental system of units, 6.2.2
- fundamental unit, 6.3.3
- Galois extensions, Chapter 8
- Gauss sum, A7
- global field, Chapter 9 Introduction
- greatest common divisor of ideals, 3.3.6
- Hensel's lemma, 9.5.2
- ideal class group, 3.4.5
  - finiteness of, 5.3.6
- inert prime, 4.3.2
- inertia field, 8.2.7
  - group, 8.1.5
- inertial degree, see relative degree
- infinite prime, 9.2 Problem 1
- integral basis, 2.3.7
  - of a cyclotomic field, 7.2.6
- integral closure, 1.1.5
- integral element, extension, 1.1.1
- integral ideal, 3.2.4
- integrally closed, 1.1.5
- isosceles triangle, 9.1.6
- Jacobi symbol, A12
- Kummer's theorem, 4.3.1
- lattice, 5.1.1
- least common multiple of ideals, 3.3.6
- Legendre symbol, A2
- lifting of prime ideals, 4.1.1
- local field, Chapter 9 Introduction, 9.4.4
- local ring, 1.2.7
- localization, 1.2 Introduction
  - functor, 1.2 Problem 4
  - of modules, 1.2.11
- localized ring, 1.2
- lying over, 4.1.1
- minimal polynomial, 2.1.3
- Minkowski bound on element norms, 5.3.4

on ideal norms, 5.3.5  
 Minkowski's convex body theorem, 5.1.3  
 multiplicative property of norms, 2.1.3, 4.2.1, 4.2.7  
 multiplicative set, 1.2 Introduction  
 nonarchimedean absolute value, 9.1.1  
 nondegenerate bilinear form, 2.1.9  
 norm, Chapter 1 Introduction, 2.1.1  
 norm of an ideal, 4.2.1  
 null sequence, 9.4.1  
 number field, 2.2.1  
 number ring, 4.2.1  
 $p$ -adic logarithm and exponential, 9.4 Problems  
 $p$ -adic integers, 9.4.6  
 $p$ -adic numbers, 9.4.6  
 $P$ -adic (and  $p$ -adic) valuation, 9.1.2  
 power series, 9.4.4  
 prime avoidance lemma, 3.1 Problems 1-3  
 prime element, 9.4.4  
 principal fractional ideal, 3.4.5  
 product formula, 9.2 Problem 1  
 quadratic extension, 2.1.10, 2.2.6, 2.2 Problems 1-3, 4.3.2, 6.3.1, 6.3.3  
 quadratic reciprocity, 8.3.4, A8  
 ram-rel identity, 4.1.6  
 ramification, 4.1.3  
     and the discriminant, 4.2 Problems 1-6  
     index, 4.1.3  
     of a prime, 4.3.2  
 rational integers, 2.2.5, 2.3 Problem 2  
 relative degree, 4.1.3  
 residue class degree, see relative degree  
 residue field, 9.5.1  
 ring of fractions, 1.2 Introduction  
 splitting of a prime, 4.3.2  
 stabilizing a module, 1.1.2  
 Stickelberger's theorem, 2.3 Problems 1-3  
 supplementary laws, A6, A10  
 totally ramified, 8.3.5  
 trace, 2.1.1  
     form, 2.1.9  
 transitivity of integral extensions, 1.1.4  
     of trace and norm, 2.1.7  
 trivial absolute value, 9.1.2  
 uniformizer, 9.4.4  
 unimodular matrix, 2.3.10, 5.1.1  
 unique factorization of ideals, 3.3.1  
 unit theorem, see Dirichlet unit theorem

4

valuation ideal, 9.1.3

valuation ring, 9.1.3

Vandermonde determinant, 2.3.5