

1. Record Nr.	UNINA9910136612203321
Autore	Evertse J. H.
Titolo	Discriminant equations in Diophantine number theory / / Janj-Hendrik Evertse, Kalman Gyory [[electronic resource]]
Pubbl/distr/stampa	Cambridge : , : Cambridge University Press, , 2017
ISBN	1-316-72721-1 1-316-72841-2 1-316-72861-7 1-316-16076-9 1-316-72881-1 1-316-72961-3 1-316-72901-X
Descrizione fisica	1 online resource (xviii, 457 pages) : digital, PDF file(s)
Collana	New Mathematical monographs ; ; 32
Disciplina	512.74
Soggetti	Diophantine equations
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Title from publisher's bibliographic system (viewed on 01 Nov 2016).
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Cover; Half title; Series; Title; Copyright; Contents; Preface; Acknowledgments; Summary; Part One Preliminaries; 1 Finite Etale Algebras over Fields; 1.1 Terminology for Rings and Algebras; 1.2 Finite Field Extensions; 1.3 Basic Facts on Finite Etale Algebras over Fields; 1.4 Resultants and Discriminants of Polynomials; 1.5 Characteristic Polynomial, Trace, Norm, Discriminant; 1.6 Integral Elements and Orders; 2 Dedekind Domains; 2.1 Definitions; 2.2 Ideal Theory of Dedekind Domains; 2.3 Discrete Valuations; 2.4 Localization; 2.5 Integral Closure in Finite Field Extensions 2.6 Extensions of Discrete Valuations 2.7 Norms of Ideals; 2.8 Discriminant and Different; 2.9 Lattices over Dedekind Domains; 2.10 Discriminants of Lattices of Etale Algebras; 3 Algebraic Number Fields; 3.1 Definitions and Basic Results; 3.1.1 Absolute Norm of an Ideal; 3.1.2 Discriminant, Class Number, Unit Group and Regulator; 3.1.3 Explicit Estimates; 3.2 Absolute Values: Generalities; 3.3 Absolute Values and Places on Number Fields; 3.4 S-integers, S-units and S-norm; 3.5 Heights and Houses; 3.6 Estimates for Units and S-units

3.7 Effective Computations in Number Fields and Etale Algebras 3.7.1 Algebraic Number Fields; 3.7.2 Relative Extensions and Finite Etale Algebras; 4 Tools from the Theory of Unit Equations; 4.1 Effective Results over Number Fields; 4.1.1 Equations in Units of Rings of Integers; 4.1.2 Equations with Unknowns from a Finitely Generated Multiplicative Group; 4.2 Effective Results over Finitely Generated Domains; 4.3 Ineffective Results, Bounds for the Number of Solutions; Part Two Monic Polynomials and Integral Elements of Given Discriminant, Monogenic Orders; 5 Basic Finiteness Theorems 5.1 Basic Facts on Finitely Generated Domains 5.2 Discriminant Forms and Index Forms; 5.3 Monogenic Orders, Power Bases, Indices; 5.4 Finiteness Results; 5.4.1 Discriminant Equations for Monic Polynomials; 5.4.2 Discriminant Equations for Integral Elements in Etale Algebras; 5.4.3 Discriminant Form and Index Form Equations; 5.4.4 Consequences for Monogenic Orders; 6 Effective Results over \mathbb{Z} ; 6.1 Discriminant Form and Index Form Equations; 6.2 Applications to Integers in a Number Field; 6.3 Proofs; 6.4 Algebraic Integers of Arbitrary Degree; 6.5 Proofs 6.6 Monic Polynomials of Given Discriminant 6.7 Proofs; 6.8 Notes; 6.8.1 Some Related Results; 6.8.2 Generalizations over \mathbb{Z} ; 6.8.3 Other Applications; 7 Algorithmic Resolution of Discriminant Form and Index Form Equations; 7.1 Solving Discriminant Form and Index Form Equations via Unit Equations, A General Approach; 7.1.1 Quintic Number Fields; 7.1.2 Examples; 7.2 Solving Discriminant Form and Index Form Equations via Thue Equations; 7.2.1 Cubic Number Fields; 7.2.2 Quartic Number Fields; 7.2.3 Examples; 7.3 The Solvability of Index Equations in Various Special Number Fields; 7.4 Notes 8 Effective Results over the S -integers of a Number Field

Sommario/riassunto

Discriminant equations are an important class of Diophantine equations with close ties to algebraic number theory, Diophantine approximation and Diophantine geometry. This book is the first comprehensive account of discriminant equations and their applications. It brings together many aspects, including effective results over number fields, effective results over finitely generated domains, estimates on the number of solutions, applications to algebraic integers of given discriminant, power integral bases, canonical number systems, root separation of polynomials and reduction of hyperelliptic curves. The authors' previous title, *Unit Equations in Diophantine Number Theory*, laid the groundwork by presenting important results that are used as tools in the present book. This material is briefly summarized in the introductory chapters along with the necessary basic algebra and algebraic number theory, making the book accessible to experts and young researchers alike.