

1. Record Nr.	UNINA9910956106103321
Autore	Ebbinghaus Heinz-Dieter <1939->
Titolo	Mathematical Logic / / by H.-D. Ebbinghaus, J. Flum, Wolfgang Thomas
Pubbl/distr/stampa	New York, NY : , : Springer New York : , : Imprint : Springer, , 1994
ISBN	1-4757-2355-5
Edizione	[2nd ed. 1994.]
Descrizione fisica	1 online resource (X, 291 p.)
Collana	Undergraduate Texts in Mathematics, , 2197-5604
Classificazione	03-01
Disciplina	511.3
Soggetti	Logic, Symbolic and mathematical Mathematics - Study and teaching Mathematical Logic and Foundations Mathematics Education
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Bibliographic Level Mode of Issuance: Monograph
Nota di bibliografia	Includes bibliographical references and indexes.
Nota di contenuto	A -- I Introduction -- II Syntax of First-Order Languages -- III Semantics of First-Order Languages -- IV A Sequent Calculus -- V The Completeness Theorem -- VI The Löwenheim-Skolem and the Compactness Theorem -- VII The Scope of First-Order Logic -- VIII Syntactic Interpretations and Normal Forms -- B -- IX Extensions of First-Order Logic -- X Limitations of the Formal Method -- XI Free Models and Logic Programming -- XII An Algebraic Characterization of Elementary Equivalence -- XIII Lindström's Theorems -- References -- Symbol Index.
Sommario/riassunto	What is a mathematical proof? How can proofs be justified? Are there limitations to provability? To what extent can machines carry out mathematical proofs? Only in this century has there been success in obtaining substantial and satisfactory answers. The present book contains a systematic discussion of these results. The investigations are centered around first-order logic. Our first goal is Godel's completeness theorem, which shows that the consequence relation coincides with formal provability: By means of a calculus consisting of simple formal inference rules, one can obtain all consequences of a given axiom system (and in particular, imitate all mathematical proofs). A short digression into model theory will help us to analyze the expressive power of the first-order language, and it will turn out that

there are certain deficiencies. For example, the first-order language does not allow the formulation of an adequate axiom system for arithmetic or analysis. On the other hand, this difficulty can be overcome--even in the framework of first-order logic--by developing mathematics in set-theoretic terms. We explain the prerequisites from set theory necessary for this purpose and then treat the subtle relation between logic and set theory in a thorough manner.
