

An Introduction to Mathematical Logic and Type Theory: To Truth Through Proof (Applied Logic Series)

By Peter B. Andrews

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The last three chapters of the book provide an introduction to type theory (higher-order logic). It is shown how various mathematical concepts can be formalized in this very expressive formal language. This expressive notation facilitates proofs of the classical incompleteness and undecidability theorems which are very elegant and easy to understand. The discussion of semantics makes clear the important distinction between standard and nonstandard models which is so important in understanding puzzling phenomena such as the incompleteness theorems and Skolem's Paradox about countable models of set theory.

Some of the numerous exercises require giving formal proofs. A computer program called ETPS which is available from the web facilitates doing and checking such exercises.

Audience: This volume will be of interest to mathematicians, computer scientists, and philosophers in universities, as well as to computer scientists in industry who wish to use higher-order logic for hardware and software specification and verification.

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- Sales Rank: #2357168 in Books
- Brand: Brand: Springer
- Published on: 2002-07-31
- Original language: English
- Number of items: 1
- Dimensions: 9.21" h x 1.00" w x 6.14" l, 1.59 pounds
- Binding: Hardcover
- 390 pages

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