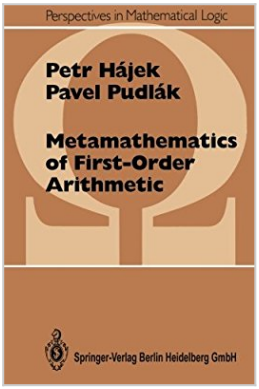

Metamathematics of First-Order Arithmetic (Perspectives in Mathematical Logic)

By Petr Hajek, Pavel Pudlak

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People have always been interested in numbers, in particular the natural numbers. Of course, we all have an intuitive notion of what these numbers are. In the late 19th century mathematicians, such as Grassmann, Frege and Dedekind, gave definitions for these familiar objects. Since then the development of axiomatic schemes for arithmetic have played a fundamental role in a logical understanding of mathematics. There has been a need for some time for a monograph on the metamathematics of first-order arithmetic. The aim of the book by Hajek and Pudlak is to cover some of the most important results in the study of a first order theory of the natural numbers, called Peano arithmetic and its fragments (subtheories). The field is quite active, but only a small part of the results has been covered in monographs. This book is divided into three parts. In Part A, the authors develop parts of mathematics and logic in various fragments. Part B is devoted to incompleteness. Part C studies systems that have the induction schema restricted to bounded formulas (Bounded Arithmetic). One highlight of this section is the relation of provability to computational complexity. The study of formal systems for arithmetic is a prerequisite for understanding results such as Gödel's theorems. This book is intended for those who want to learn more about such systems and who want to follow current research in the field. The book contains a bibliography of approximately 1000 items.

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Review
'... a very important contribution to the logical literature. It gives a survey of an incredible number of results and methods in the foundations of arithmetic, presented in a clear and systematic way. It will certainly be highly appreciated by specialists working in the field.' Roman Murawski, Mathematical Reviews

'... really a highly interesting book - a survey of a large amount of results presented in a systematic and clear way. It will serve as a source of information for those who want to learn metamathematics of first-order arithmetic as well as a reference book for people working in this field.' Zentralblatt f?r Mathemat?k und ihre Grenzgebiete

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About the Author
Petr Hájek works in the Institute of Computer Science at the Academy of Sciences of the Czech Republic, Prague.

Pavel Pudlák works in the Mathematical Institute at the Academy of Sciences of the Czech Republic, Prague.

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