

Reverse Mathematics

Problems, Reductions, and Proofs

Reverse mathematics studies the complexity of proving mathematical theorems and solving mathematical problems. Typical questions include: Can we prove this result without first proving that one? Can a computer solve this problem? A highly active part of mathematical logic and computability theory, the subject offers beautiful results as well as significant foundational insights.

This text provides a modern treatment of reverse mathematics that combines computability theoretic reductions and proofs in formal arithmetic to measure the complexity of theorems and problems from all areas of mathematics. It includes detailed introductions to techniques from computable mathematics, Weihrauch style analysis, and other parts of computability that have become integral to research in the field.

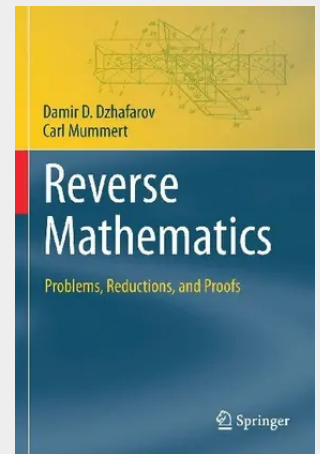
Topics and features :

- Provides a complete introduction to reverse mathematics, including necessary background from computability theory, second order arithmetic, forcing, induction, and model construction
- Offers a comprehensive treatment of the reverse mathematics of combinatorics, including Ramsey's theorem, Hindman's theorem, and many other results
- Provides central results and methods from the past two decades, appearing in book form for the first time and including preservation techniques and applications of probabilistic arguments
- Includes a large number of exercises of varying levels of difficulty, supplementing each chapter

The text will be accessible to students with a standard first year course in mathematical logic. It will also be a useful reference for researchers in reverse mathematics, computability theory, proof theory, and related areas.

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