



PROBLEMS AND SOLUTIONS IN MATHEMATICS

2nd Edition

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ABOUT THE BOOK

This book contains a selection of more than 500 mathematical problems and their solutions from the PhD qualifying examination papers of more than ten famous American universities. The mathematical problems cover six aspects of graduate school mathematics: Algebra, Topology, Differential Geometry, Real Analysis, Complex Analysis and Partial Differential Equations. While the depth of knowledge involved is not beyond the contents of the textbooks for graduate students, discovering the solution of the problems requires a deep understanding of the mathematical principles plus skilled techniques. For students, this book is a valuable complement to textbooks. Whereas for lecturers teaching graduate school mathematics, it is a helpful reference.

READERSHIP

PhD mathematics students and lecturers.

CONTENTS

- Algebra:
- Linear Algebra
- Group Theory
- Ring Theory
- Field and Galois Theory
- Topology:
- Point Set Topology
- Homotopy Theory
- Homology Theory
- Differential Geometry:
 - Differential Geometry of Curves
 - Differential Geometry of Surfaces
 - Differential Geometry of Manifolds
- *Real Analysis:*
 - Measurability and Measure
 - Integral
 - Space of Integrable Functions
 - Differential
 - Miscellaneous Problems
- Complex Analysis:
 - Analytic and Harmonic Functions
 - Geometry of Analytic Functions
 - Complex Integration
 - The Maximum Modulus and Argument Principles
 - Series and Normal Families
- Partial Differential Equations:
- General Theory
- Elliptic Equations
- Parabolic Equations
- Hyperbolic Equations

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