

Berkeley Problems in Mathematics

In 1977, the Mathematics Department at the University of California, Berkeley, instituted a written examination as one of the first major requirements for the Ph.D. degree in Mathematics. Its purpose was to determine whether first-year students in the Ph.D. program had successfully mastered basic mathematics, ensuring they could continue in the program with a strong likelihood of success. Since its inception, the exam has become a significant hurdle in the pursuit of the degree.

This book, now in its fourth edition, has been updated with the most recent exams up to 2025. Its purpose is to make the material widely available and to aid students in preparing for the examination during their undergraduate years. The book compiles over 1,800 problems that have appeared on Berkeley's preliminary exams, along with solutions to most of them. Students who work through this book will develop problem-solving skills in areas such as real analysis, multivariable calculus, differential equations, metric spaces, complex analysis, algebra, and linear algebra. The problems are organized by subject and arranged in increasing order of difficulty. Tags indicating the exact exam year allow students to rehearse complete examinations. The appendix includes instructions for accessing electronic versions of the exams as well as a syllabus.

All of this makes the book an invaluable resource for every mathematics student who plans to enter a Ph.D. program.

The book is a compilation of more than 1,800 problems that have appeared on Berkeley's preliminary exams since 1977. It is an invaluable resource of problems and solutions for every mathematics student who plans to enter a Ph.D. program. Students who work through this book will develop problem-solving skills in areas such as real analysis, multivariable calculus, differential equations, metric spaces, complex analysis, algebra, and linear algebra. This new edition has been updated with the most recent exams, including those given during the Fall 2025 semester.



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