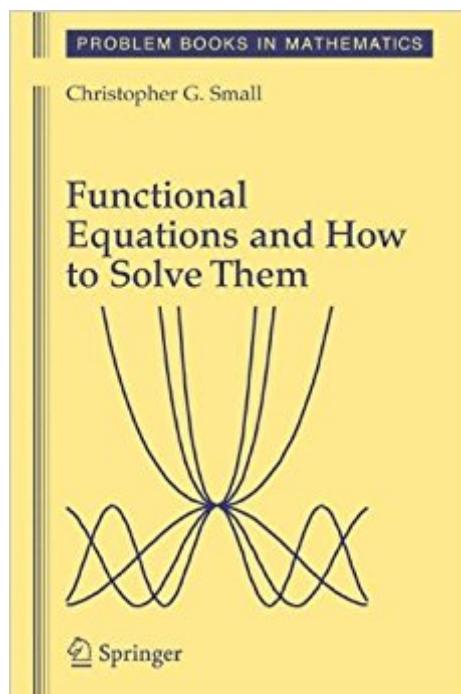


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# Functional Equations And How To Solve Them (Problem Books In Mathematics)



## Synopsis

Many books have been written on the theory of functional equations, but very few help readers solve functional equations in mathematics competitions and mathematical problem solving. This book fills that gap. Each chapter includes a list of problems associated with the covered material. These vary in difficulty, with the easiest being accessible to any high school student who has read the chapter carefully. The most difficult will challenge students studying for the International Mathematical Olympiad or the Putnam Competition. An appendix provides a springboard for further investigation of the concepts of limits, infinite series and continuity.

## Book Information

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## Customer Reviews

From the reviews: "This book is devoted to functional equations of a special type, namely to those appearing in competitions |. The book contains many solved examples and problems at the end of each chapter. | The book has 130 pages, 5 chapters and an appendix, a Hints/Solutions section, a short bibliography and an index. | The book will be valuable for instructors working with young gifted students in problem solving seminars." (EMS Newsletter, June, 2008)

This book covers topics in the theory and practice of functional equations. Special emphasis is given to methods for solving functional equations that appear in mathematics contests, such as the Putnam competition and the International Mathematical Olympiad. This book will be of particular

interest to university students studying for the Putnam competition, and to high school students working to improve their skills on mathematics competitions at the national and international level. Mathematics educators who train students for these competitions will find a wealth of material for training on functional equations problems. The book also provides a number of brief biographical sketches of some of the mathematicians who pioneered the theory of functional equations. The work of Oresme, Cauchy, Babbage, and others, is explained within the context of the mathematical problems of interest at the time. Christopher Small is a Professor in the Department of Statistics and Actuarial Science at the University of Waterloo. He has served as the co-coach on the Canadian team at the IMO (1997, 1998, 2000, 2001, and 2004), as well as the Waterloo Putnam team for the William Lowell Putnam Competition (1986-2004). His previous books include Numerical Methods for Nonlinear Estimating Equations (Oxford 2003), The Statistical Theory of Shape (Springer 1996), Hilbert Space Methods in Probability and Statistical Inference (Wiley 1994).  $\hat{A}$  From the reviews: Functional Equations and How to Solve Them fills a need and is a valuable contribution to the literature of problem solving. - Henry Ricardo, MAA Reviews The main purpose and merits of the book...are the many solved, unsolved, partially solved problems and hints about several particular functional equations. - Janos Aczel, Zentralblatt

Concise and informative, but spotty. It is neither introductory, nor systematic, but well worth skimming, and gives one a taste of the intrinsic sweetness of the field, as well as the basic tools of the trade. Aczel's book is far superior, however.

This book is a nice introduction to the topic. It is very concise and brief. The author has placed a good effort to selected what he thinks as the most important ideas in the topic and create a unified point of view in his presentation. It is written in a nice lively way with brief historical comments. For those who want to be introduced to the field of functional equations and study the core ideas, it will be very valuable. However, for a demanding reader the book is too short and leaves him/her partially unsatisfied. Having read this book and  $\hat{A}$  Introduction to Functional Equations: Theory and Problem-solving Strategies for Mathematical Competitions and Beyond (MSRI Mathematical Circles Library), I feel that the latter is a better choice for those readers who want a more in-depth coverage of the topic. The latter book also has by far more solved and unsolved problems. Even more, Small does not label the problems which are taken from math competitions. In contrast, the other book clearly states at the beginning in which competition it was given or from which journal it was taken. Finally, Small gives only 17 references compared to 66 references in the other book. For those

readers who have some extra time to invest, it is probably a good idea to start with Small's book to get a crash course, then move to the other which is certainly more extensive and thorough. Both books have good and solid writing although the styles are quite different. And the combined knowledge and perspective will certainly be an advantage to anyone who reads them.

The book is excellent because it fills an important contribution to the literature of functional equations, which is not easy to find.

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