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A Primer Of Abstract Mathematics

Robert B. Ash



A Primer Of Abstract Mathematics:

A Primer of Abstract Mathematics Robert B. Ash, 2020-03-02 The purpose of this book is to prepare the reader for coping with abstract mathematics The intended audience is both students taking a first course in abstract algebra who feel the need to strengthen their background and those from a more applied background who need some experience in dealing with abstract ideas Learning any area of abstract mathematics requires not only ability to write formally but also to think intuitively about what is going on and to describe that process clearly and cogently in ordinary English Ash tries to aid intuition by keeping proofs short and as informal as possible and using concrete examples as illustration Thus it is an ideal textbook for an audience with limited experience in formalism and abstraction A number of expository innovations are included for example an informal development of set theory which teaches students all the basic results for algebra in one chapter

A Primer of Abstract Algebra Robert B. Ash, 1998-09-10 The purpose of this book is to prepare the reader for coping with abstract mathematics The intended audience is both students taking a first course in abstract algebra who feel the need to strengthen their background and those from a more applied background who need some experience in dealing with abstract ideas Learning any area of abstract mathematics requires not only ability to write formally but also to think intuitively about what is going on and to describe that process clearly and cogently in ordinary English Ash tries to aid intuition by keeping proofs short and as informal as possible and using concrete examples as illustration Thus it is an ideal textbook for an audience with limited experience in formalism and abstraction A number of expository innovations are included for example an informal development of set theory which teaches students all the basic results for algebra in one chapter

Mathematical Modeling in the Environment Charles R. Hadlock, 1999-03-04 This book has a dual objective first to introduce the reader to some of the most important and widespread environmental issues of the day and second to illustrate the vital role played by mathematical models in investigating these issues The subjects covered are ground water contamination air pollution and hazardous materials emergencies These issues are presented in their full real world context and are used to develop important classical mathematical themes The emphasis throughout is on fundamental principles and concepts not on achieving technical mastery of state of the art models

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An Introduction to Abstract Mathematics Robert J. Bond, William J. Keane, 2007-08-24 Bond and Keane explicate the elements of logical mathematical argument to elucidate the meaning and importance of mathematical

rigor With definitions of concepts at their disposal students learn the rules of logical inference read and understand proofs of theorems and write their own proofs all while becoming familiar with the grammar of mathematics and its style In addition they will develop an appreciation of the different methods of proof contradiction induction the value of a proof and the beauty of an elegant argument The authors emphasize that mathematics is an ongoing vibrant discipline its long fascinating history continually intersects with territory still uncharted and questions still in need of answers The authors extensive background in teaching mathematics shines through in this balanced explicit and engaging text designed as a primer for higher level mathematics courses They elegantly demonstrate process and application and recognize the byproducts of both the achievements and the missteps of past thinkers Chapters 1-5 introduce the fundamentals of abstract mathematics and chapters 6-8 apply the ideas and techniques placing the earlier material in a real context Readers interest is continually piqued by the use of clear explanations practical examples discussion and discovery exercises and historical comments

Some Abstract Algebra Richard Grassl, Tabitha Mingus, 2018-05-08 This book consists of two parts one a primer designed to provide an adequate introduction to the essentials of abstract algebra and to some related number theory and two a workbook designed to enable the reader to interactively engage with colleagues in exploring the fascinating world of abstract algebra We have taken a problem solving approach the primer alone contains over 130 problems So be prepared for minimal text material to read combined with worksheets that extend and enhance text topics These worksheets are designed to encourage discovery of interesting relationships between algebraic structures geometry mappings and proofs Very little if any background in abstract algebra is needed for a course based on this Primer and the workbook This material has been used successfully for over a decade with in service secondary teachers seeking licensure or an MA degree in teaching mathematics In this book we embrace the oft quoted maxim You learn mathematics by doing mathematics Such an effort leads to better understanding and deeper learning Finally a valuable by product A significant number of teachers who have studied this material have incorporated a variety of the worksheets into their secondary curriculum as they encounter topics like closure binary operations and their properties modular arithmetic and the structure of the integers yes GCD and LCM show up and the rational and real numbers This book is rebound under an open source license and is available in electronic format for free at <http://www.openmathbooks.org/someabstract>

Proofs and Fundamentals Ethan D. Bloch, 2011-02-15
Proofs and Fundamentals A First Course in Abstract Mathematics 2nd edition is designed as a transition course to introduce undergraduates to the writing of rigorous mathematical proofs and to such fundamental mathematical ideas as sets functions relations and cardinality The text serves as a bridge between computational courses such as calculus and more theoretical proofs oriented courses such as linear algebra abstract algebra and real analysis This 3 part work carefully balances Proofs Fundamentals and Extras Part 1 presents logic and basic proof techniques Part 2 thoroughly covers fundamental material such as sets functions and relations and Part 3 introduces a variety of extra topics such as groups combinatorics and

sequences A gentle friendly style is used in which motivation and informal discussion play a key role and yet high standards in rigor and in writing are never compromised New to the second edition 1 A new section about the foundations of set theory has been added at the end of the chapter about sets This section includes a very informal discussion of the Zermelo Fraenkel Axioms for set theory We do not make use of these axioms subsequently in the text but it is valuable for any mathematician to be aware that an axiomatic basis for set theory exists Also included in this new section is a slightly expanded discussion of the Axiom of Choice and new discussion of Zorn's Lemma which is used later in the text 2 The chapter about the cardinality of sets has been rearranged and expanded There is a new section at the start of the chapter that summarizes various properties of the set of natural numbers these properties play important roles subsequently in the chapter The sections on induction and recursion have been slightly expanded and have been relocated to an earlier place in the chapter following the new section both because they are more concrete than the material found in the other sections of the chapter and because ideas from the sections on induction and recursion are used in the other sections Next comes the section on the cardinality of sets which was originally the first section of the chapter this section gained proofs of the Schroeder Bernstein theorem and the Trichotomy Law for Sets and lost most of the material about finite and countable sets which has now been moved to a new section devoted to those two types of sets The chapter concludes with the section on the cardinality of the number systems 3 The chapter on the construction of the natural numbers integers and rational numbers from the Peano Postulates was removed entirely That material was originally included to provide the needed background about the number systems particularly for the discussion of the cardinality of sets but it was always somewhat out of place given the level and scope of this text The background material about the natural numbers needed for the cardinality of sets has now been summarized in a new section at the start of that chapter making the chapter both self contained and more accessible than it previously was 4 The section on families of sets has been thoroughly revised with the focus being on families of sets in general not necessarily thought of as indexed 5 A new section about the convergence of sequences has been added to the chapter on selected topics This new section which treats a topic from real analysis adds some diversity to the chapter which had hitherto contained selected topics of only an algebraic or combinatorial nature 6 A new section called You Are the Professor has been added to the end of the last chapter This new section which includes a number of attempted proofs taken from actual homework exercises submitted by students offers the reader the opportunity to solidify her facility for writing proofs by critiquing these submissions as if she were the instructor for the course 7 All known errors have been corrected 8 Many minor adjustments of wording have been made throughout the text with the hope of improving the exposition

Basic Abstract Algebra Robert B. Ash, 2013-06-17 Relations between groups and sets results and methods of abstract algebra in terms of number theory and geometry and noncommutative and homological algebra Solutions 2006 edition [Bridge to Abstract Mathematics](#) Ralph W. Oberste-Vorth, Aristides Mouzakis, Bonita A. Lawrence, 2020-02-20 A Bridge to Abstract

Mathematics will prepare the mathematical novice to explore the universe of abstract mathematics. Mathematics is a science that concerns theorems that must be proved within the constraints of a logical system of axioms and definitions rather than theories that must be tested, revised, and retested. Readers will learn how to read mathematics beyond popular computational calculus courses. Moreover, readers will learn how to construct their own proofs. The book is intended as the primary text for an introductory course in proving theorems as well as for self study or as a reference. Throughout the text, some pieces, usually proofs, are left as exercises. Part V gives hints to help students find good approaches to the exercises. Part I introduces the language of mathematics and the methods of proof. The mathematical content of Parts II through IV were chosen so as not to seriously overlap the standard mathematics major. In Part II, students study sets, functions, equivalence, and order relations and cardinality. Part III concerns algebra. The goal is to prove that the real numbers form the unique up to isomorphism ordered field with the least upper bound. In the process, we construct the real numbers starting with the natural numbers. Students will be prepared for an abstract linear algebra or modern algebra course. Part IV studies analysis. Continuity and differentiation are considered in the context of time scales, nonempty closed subsets of the real numbers. Students will be prepared for advanced calculus and general topology courses. There is a lot of room for instructors to skip and choose topics from among those that are presented.

Cameos for Calculus Roger B. Nelsen, 2015-12-31 A thespian or cinematographer might define a cameo as a brief appearance of a known figure, while a gemologist or lapidary might define it as a precious or semiprecious stone. This book presents fifty short enhancements or supplements to the cameos for the first year calculus course in which a geometric figure briefly appears. Some of the cameos illustrate mainstream topics such as the derivative, combinatorial formulas used to compute Riemann sums, or the geometry behind many geometric series. Other cameos present topics accessible to students at the calculus level but not usually encountered in the course, such as the Cauchy-Schwarz inequality, the arithmetic mean-geometric mean inequality, and the Euler-Mascheroni constant. There are fifty cameos in the book, grouped into five sections: Part I, Limits and Differentiation; Part II, Integration; Part III, Infinite Series; Part IV, Additional Topics; and Part V, Appendix: Some Precalculus Topics. Many of the cameos include exercises, so Solutions to all the Exercises follows Part V. The book concludes with references and an index. Many of the cameos are adapted from articles published in journals of the MAA, such as *The American Mathematical Monthly*, *Mathematics Magazine*, and *The College Mathematics Journal*. Some come from other mathematical journals, and some were created for this book. By gathering the cameos into a book, the Author hopes that they will be more accessible to teachers of calculus, both for use in the classroom and as supplementary explorations for students.

A Primer Of Abstract Mathematics Book Review: Unveiling the Power of Words

In a world driven by information and connectivity, the ability of words has become more evident than ever. They have the capacity to inspire, provoke, and ignite change. Such may be the essence of the book **A Primer Of Abstract Mathematics**, a literary masterpiece that delves deep to the significance of words and their effect on our lives. Published by a renowned author, this captivating work takes readers on a transformative journey, unraveling the secrets and potential behind every word. In this review, we shall explore the book's key themes, examine its writing style, and analyze its overall impact on readers.

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