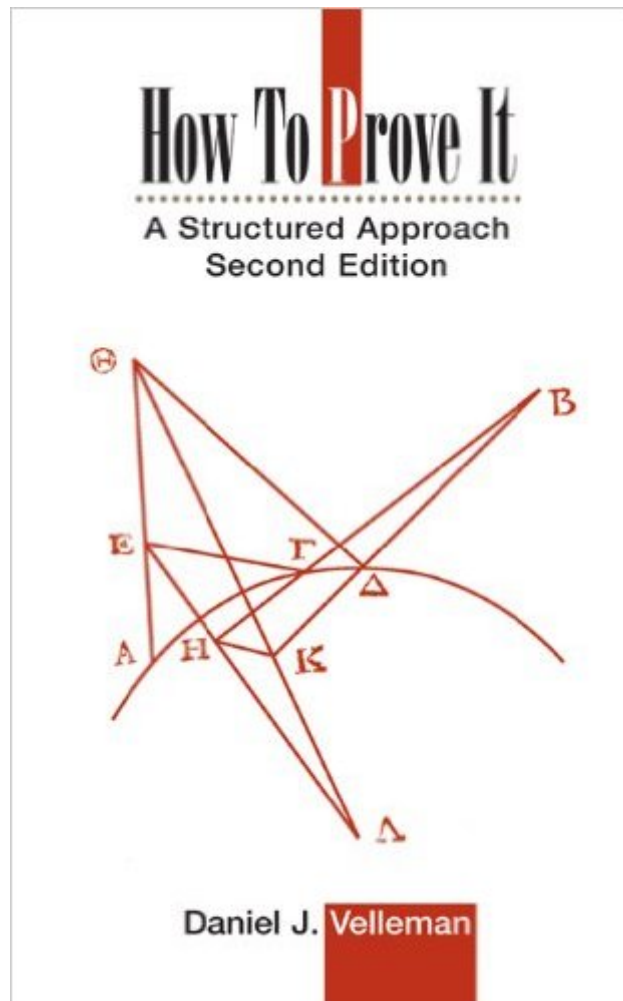# How To Prove It: A Structured Approach

Synopsis

Many students have trouble the first time they take a mathematics course in which proofs play a significant role. This new edition of Velleman's successful text will prepare students to make the transition from solving problems to proving theorems by teaching them the techniques needed to read and write proofs. The book begins with the basic concepts of logic and set theory, to familiarize students with the language of mathematics and how it is interpreted. These concepts are used as the basis for a step-by-step breakdown of the most important techniques used in constructing proofs. The author shows how complex proofs are built up from these smaller steps, using detailed 'scratch work' sections to expose the machinery of proofs about the natural numbers, relations, functions, and infinite sets. To give students the opportunity to construct their own proofs, this new edition contains over 200 new exercises, selected solutions, and an introduction to Proof Designer software. No background beyond standard high school mathematics is assumed. This book will be useful to anyone interested in logic and proofs: computer scientists, philosophers, linguists, and of course mathematicians.

Book Information

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Customer Reviews

Before buying this book, I struggled in math. I excelled at "calculating" stuff by simply plugging in numbers into some sort of equation our high school teachers would spoil us with, but when I got to college, I had to start thinking abstractly- and it bothered me a lot, because I had no idea how to test or prove the logic of some statement. I was doing very poorly in linear algebra and desperately needed help- lo and behold, my professors weren't helpful (at all). Someone recommended this proof writing book to me, and I am VERY grateful for that referral.The book takes the average student (it's shocking with how little math background one needs) and introduces him to basic boolean logic. You know, material like "If A is true, and B is false, then A implies B is false." In a discrete mathematics course, one would call this "truth tables." From there, the author takes the reader into set theory, basic proofs, group theory, etc- and into more advanced topics, like the Cantor-Schroeder-Bernstein theorem, countability, etc. So what makes this book stand out?(1) Readability. Many math professors stop just short of taking pride in how confusing, abstract, or daunting their lectures can be. Velleman, however, goes the extra mile in the text to see that the reader UNDERSTANDS the logical buildup and concepts of mathematical proofs. Sure, set theory can be confusing- but after reading several other texts in discrete math, including "Discrete Math and its Applications" by Kenneth Rosen (if you're reading this, no offense) I've found that Velleman by far writes the most comprehensive and cohesive explanations for understanding set theory.

My goal for this review is to make it as helpful as possible to someone considering to buy this Book !-I will not go over most of the summaries of the text provided by my fellow reviewers but will provide two important clarifications.1st:I read in another review that that the Kindle version of the text interprets some logical operators or other notation incorrectly causing confusion with what the text or exercises are referring to....This Statement is FALSE. I have purchased the kindle version and did not find one inconsistency and all notations are indeed accurate.2nd:I have found that a major complaint about this text is that it does not provide enough solutions to its exercises for one to verify whether they have actually learned the material or not.This Statement is TRUE. On average, out of 7 question in each section, only 2 solutions are given in the back of the text.HOWEVER!!! There is another way to circumvent this problem. The Department of Mathematics of the University of California, Santa Barbara has been so kind as to post the Solutions to the unlisted problems on their website.Please visit this site to view them:http://www.math.ucsb.edu/~dai/813wang.htmlNow with

both of these clarifications in place, and after going through a couple of other Mathematical Proof books, and I personally prefer this one. It is direct, and covers the basics needed for understanding and doing proofs.One must understand that doing proofs is a skill a Mathematician gains through vast experience, practice and long hours of thought. Finding a book that breaks down a universal method of proofing in the same simple way an Algebra text shows how to use a formula will not be possible.

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