BUILDING PROOFS

A Practical Guide

This book introduces students to the art and craft of writing proofs, beginning with the basics of writing proofs and logic, and continuing on with more in-depth issues and examples of creating proofs in different parts of mathematics, as well as introducing proofs-of-correctness for algorithms. The creation of proofs is covered for theorems in both discrete and continuous mathematics, and in difficulty ranging from elementary to beginning graduate level.

Just beyond the standard introductory courses on calculus, theorems and proofs become central to mathematics. Students often find this emphasis difficult and new. This book is a guide to understanding and creating proofs. It explains the standard "moves" in mathematical proofs: direct computation, expanding definitions, proof by contradiction, proof by induction, as well as choosing notation and strategies.

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