Discrete Mathematics with Proof



By Eric Gossett



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A Trusted Guide to Discrete Mathematics with Proof?Now in a Newly Revised Edition

Discrete mathematics has become increasingly popular in recent years due to its growing applications in the field of computer science. *Discrete Mathematics with Proof, Second Edition* continues to facilitate an up-to-date understanding of this important topic, exposing readers to a wide range of modern and technological applications.

The book begins with an introductory chapter that provides an accessible explanation of discrete mathematics. Subsequent chapters explore additional related topics including counting, finite probability theory, recursion, formal models in computer science, graph theory, trees, the concepts of functions, and relations. Additional features of the *Second Edition* include:

- An intense focus on the formal settings of proofs and their techniques, such as constructive proofs, proof by contradiction, and combinatorial proofs
- New sections on applications of elementary number theory, multidimensional induction, counting tulips, and the binomial distribution
- Important examples from the field of computer science presented as applications including the Halting problem, Shannon's mathematical model of information, regular expressions, XML, and Normal Forms in relational databases
- Numerous examples that are not often found in books on discrete mathematics including the deferred acceptance algorithm, the Boyer-Moore algorithm for pattern matching, Sierpinski curves, adaptive quadrature, the Josephus problem, and the five-color theorem
- Extensive appendices that outline supplemental material on analyzing claims and writing mathematics, along with solutions to selected chapter exercises

Combinatorics receives a full chapter treatment that extends beyond the combinations and permutations material by delving into non-standard topics such as Latin squares, finite projective planes, balanced incomplete block designs, coding theory, partitions, occupancy problems, Stirling numbers, Ramsey numbers, and systems of distinct representatives. A related Web site features animations and visualizations of combinatorial proofs that assist readers with comprehension. In addition, approximately 500 examples and over 2,800 exercises are presented throughout the book to motivate ideas and illustrate the proofs and conclusions of theorems.

Assuming only a basic background in calculus, *Discrete Mathematics with Proof, Second Edition* is an excellent book for mathematics and computer science courses at the undergraduate level. It is also a valuable resource for professionals in various technical fields who would like an introduction to discrete mathematics.

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From the Inside Flap

Discrete Mathematics with Proof

Eric Gossett

Second Edition

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About the Author

Eric Gossett, PhD, is Professor of Mathematics and Computer Science at Bethel University. Dr. Gossett has thirty years of academic and industry experience in the areas of Web programming, discrete mathematics, data structures, linear algebra, and algebraic structures. He is the recipient of the Bethel Faculty Service Award for his work developing Bethel's first generation of Web services.

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