

# Discrete Mathematics By Gary Chartrand Ping Zhang

Chromatic Graph Theory  
 A Structured Approach  
 How to Prove It  
 Graphs & Digraphs, Fifth Edition  
 Discrete Mathematics (Classic Version)  
 Second Edition  
 Chromatic Graph Theory  
 A Concise Study Companion and Guide  
 Discrete Mathematics with Applications  
 Structural Graph Theory  
 Distance In Graphs  
 Introduction to Ramsey Spaces (AM-174)  
 The Fascinating World of Graph Theory  
 An Introduction to Discrete Mathematics  
 Graph Theory  
 Fundamental Approach To Discrete Mathematics  
 A Transition to Advanced Mathematics  
 Essential Discrete Mathematics for Computer Science  
 Asymptotics and Applications (AM-164)  
 Discrete Mathematics: Introduction to Mathematical Reasoning  
 Unreasonable Leadership  
 Discrete Orthogonal Polynomials. (AM-164)  
 Discrete Mathematics and Graph Theory  
 Discrete Mathematics and Applications, Second Edition  
 Transforming Yourself, Your Team, and Your Organization to Achieve Extraordinary Results  
 Bipartite Graphs and Their Applications  
 Domination in Graphs  
 Discrete Mathematics  
 Graphs & Digraphs, Fourth Edition  
 Discrete Mathematics  
 Combinatorics of Train Tracks  
 Mathematical Proofs  
 A Transition to Advanced Mathematics  
 In Celebration of John Milnor's 80th Birthday  
 Applied and Algorithmic Graph Theory  
 Dedicated to Professor Gary Chartrand in Honor of His 70th Birthday  
 Discrete Mathematics  
 An Introduction to Mathematical Proofs  
 A First Course in Graph Theory

*Discrete Mathematics By Gary Chartrand Ping Zhang*

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## CAROLYN MARISA

**Chromatic Graph Theory** Princeton University Press

This book is intended for a one-semester course in discrete mathematics. Such a course is typically taken by mathematics, mathematics education, and computer science majors, usually in their sophomore year. Calculus is not a prerequisite to use this book. Part one focuses on how to write proofs, then moves on to topics in number theory, employing set theory in the process. Part two focuses on computations, combinatorics, graph theory, trees, and algorithms.

**A Structured Approach** Waveland Press

This is the first in a series of volumes, which provide an extensive overview of conjectures and open problems in graph theory. The readership of each volume is geared toward graduate students who may be searching for research ideas. However, the well-established mathematician will find the overall exposition engaging and enlightening. Each chapter, presented in a story-telling style, includes more than a simple collection of results on a particular topic. Each contribution conveys the history, evolution, and techniques used to solve the authors' favorite conjectures and open problems, enhancing the reader's overall comprehension and enthusiasm. The editors were inspired to create these volumes by the popular and well attended special sessions, entitled "My Favorite Graph Theory Conjectures," which were held at the winter AMS/MAA Joint Meeting in Boston (January, 2012), the SIAM Conference on Discrete Mathematics in Halifax (June, 2012) and the winter AMS/MAA Joint meeting in Baltimore (January, 2014). In an effort to aid in the creation and dissemination of open problems, which is crucial to the growth and development of a field, the editors requested the speakers, as well as notable experts in graph theory, to contribute to these volumes.

**How to Prove It** Waveland Press

Ramsey theory is a fast-growing area of combinatorics with deep connections to other fields of mathematics such as topological dynamics, ergodic theory, mathematical logic, and algebra. The area of Ramsey theory dealing with Ramsey-type phenomena in higher dimensions is particularly useful. Introduction to Ramsey Spaces presents in a systematic way a method for building higher-dimensional Ramsey spaces from basic one-dimensional principles. It is the first book-length treatment of this area of Ramsey theory, and emphasizes applications for related and surrounding fields of mathematics, such as set theory, combinatorics, real and functional analysis, and topology. In order to facilitate accessibility, the book gives the method in its axiomatic form with examples that cover many important parts of

Ramsey theory both finite and infinite. An exciting new direction for combinatorics, this book will interest graduate students and researchers working in mathematical subdisciplines requiring the mastery and practice of high-dimensional Ramsey theory. *Graphs & Digraphs, Fifth Edition* Princeton University Press With Chromatic Graph Theory, Second Edition, the authors present various fundamentals of graph theory that lie outside of graph colorings, including basic terminology and results, trees and connectivity, Eulerian and Hamiltonian graphs, matchings and factorizations, and graph embeddings. Readers will see that the authors accomplished the primary goal of this textbook, which is to introduce graph theory with a coloring theme and to look at graph colorings in various ways. The textbook also covers vertex colorings and bounds for the chromatic number, vertex colorings of graphs embedded on surfaces, and a variety of restricted vertex colorings. The authors also describe edge colorings, monochromatic and rainbow edge colorings, complete vertex colorings, several distinguishing vertex and edge colorings. Features of the Second Edition: The book can be used for a first course in graph theory as well as a graduate course. The primary topic in the book is graph coloring. The book begins with an introduction to graph theory so assumes no previous course. The authors are the most widely-published team on graph theory. Many new examples and exercises enhance the new edition. *Discrete Mathematics (Classic Version)* Cengage Learning Beginning with the origin of the four color problem in 1852, the field of graph colorings has developed into one of the most popular areas of graph theory. Introducing graph theory with a coloring theme, Chromatic Graph Theory explores connections between major topics in graph theory and graph colorings as well as emerging topics. This self-contained book first presents various fundamentals of graph theory that lie outside of graph colorings, including basic terminology and results, trees and connectivity, Eulerian and Hamiltonian graphs, matchings and factorizations, and graph embeddings. The remainder of the text deals exclusively with graph colorings. It covers vertex colorings and bounds for the chromatic number, vertex colorings of graphs embedded on surfaces, and a variety of restricted vertex colorings. The authors also describe edge colorings, monochromatic and rainbow edge colorings, complete vertex colorings, several distinguishing vertex and edge colorings, and many distance-related vertex colorings. With historical, applied, and algorithmic discussions, this text offers a solid introduction to one of the most popular areas of graph theory.

**Second Edition** CRC Press

This title is part of the Pearson Modern Classics series. Pearson Modern Classics are acclaimed titles at a value price. Please visit [www.pearsonhighered.com/math-classics-series](http://www.pearsonhighered.com/math-classics-series) for a complete list of titles. An ever-increasing percentage of mathematic

applications involve discrete rather than continuous models. Driving this trend is the integration of the computer into virtually every aspect of modern society. Intended for a one-semester introductory course, the strong algorithmic emphasis of Discrete Mathematics is independent of a specific programming language, allowing students to concentrate on foundational problem-solving and analytical skills. Instructors get the topical breadth and organizational flexibility to tailor the course to the level and interests of their students.

**Chromatic Graph Theory** CRC Press

This text explains nontrivial applications of metric space topology to analysis. Covers metric space, point-set topology, and algebraic topology. Includes exercises, selected answers, and 51 illustrations. 1983 edition.

**A Concise Study Companion and Guide** Waveland Press Inc

"Unreasonable Leadership provides a blueprint of how to lead and forge change in all types of economic environments. Gary Chartrand's powerful message of redefining the game, creating new pathways where there are none, leading without fear and mobilizing teams to coalesce around a goal is a timeless tool and is a must read for all who would call themselves leaders." Carla Harris, author of Expect To Win "Unreasonable Leadership should be required reading in every business school. What Gary Chartrand did to build Acosta into an industry leading sales and Marketing juggernaut is simply remarkable and so is this book."

Jon Gordon, Best-selling author of The Energy Bus and Soup "This is a smart, thought-provoking approach to leadership and how to create the ideal environment for bringing about positive change and achieving meaningful results." Mitt Romney, Former Governor of Massachusetts Gary Chartrand's Unreasonable Leadership provides a blueprint for leaders who are driving change not only in the corporate sector but in the social sector as well. Gary describes what it takes to be a true pioneer, to achieve unprecedented, ground breaking results despite the complexity of the work and the enormity of the challenges. We've learned through Teach for America that Unreasonable Leadership is exactly what is required to transform our entrenched public education systems. Wendy Kopp, CEO and Founder of Teach For America Achieving a vision that seemed nearly impossible, having the courage to make difficult decisions, and leading with conviction transformed a company and its entire industry. Unreasonable Leadership charts the growth of Acosta Sales and Marketing, a food brokerage firm that grew from a one-state operation employing 11 people to an international sales and marketing agency employing a staff of more than 16,000 in the US and Canada. During a 12-year span, company sales grew from \$3 billion to \$60 billion. How did this happen? Acosta Chairman Gary Chartrand followed the advice of George Bernard Shaw: "All progress comes from unreasonable people." Chartrand's success

as an unreasonable leader testifies to the value of setting a bold agenda, never being afraid to ask, and the critical importance of molding a corporate culture. His personal saga shows what can be accomplished no matter the odds of what "conventional wisdom" labels as impossible.

**Discrete Mathematics with Applications** CRC Press

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; it is 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.

**Structural Graph Theory** CRC Press

An introductory text in graph theory, this treatment covers primary techniques and includes both algorithmic and theoretical problems. Algorithms are presented with a minimum of advanced data structures and programming details. 1988 edition.

*Distance In Graphs* Pearson Education

Chartrand and Zhang's *Discrete Mathematics* presents a clearly written, student-friendly introduction to discrete mathematics. The authors draw from their background as researchers and educators to offer lucid discussions and descriptions fundamental to the subject of discrete mathematics. Unique among discrete mathematics textbooks for its treatment of proof techniques and graph theory, topics discussed also include logic, relations and functions (especially equivalence relations and bijective functions), algorithms and analysis of algorithms, introduction to number theory, combinatorics (counting, the Pascal triangle, and the binomial theorem), discrete probability, partially ordered sets, lattices and Boolean algebras, cryptography, and finite-state machines. This highly versatile text provides mathematical background used in a wide variety of disciplines, including mathematics and mathematics education, computer science, biology, chemistry, engineering, communications, and business. Some of the major features and strengths of this textbook: Numerous, carefully explained examples and applications facilitate learning. More than 1,600 exercises, ranging from elementary to challenging, are included with hints/answers to all odd-numbered exercises. Descriptions of proof techniques are accessible and lively. Students benefit from the historical discussions throughout the textbook.

*Introduction to Ramsey Spaces (AM-174)* Springer Nature

This textbook can serve as a comprehensive manual of discrete mathematics and graph theory for non-Computer Science majors; as a reference and study aid for professionals and researchers who have not taken any discrete math course before. It can also be used as a reference book for a course on Discrete Mathematics in Computer Science or Mathematics curricula. The study of discrete mathematics is one of the first courses on curricula in various disciplines such as Computer Science, Mathematics and Engineering education practices. Graphs are key data structures used to represent networks, chemical structures, games etc. and are increasingly used more in various applications such as bioinformatics and the Internet. Graph theory has gone through an unprecedented growth in the last few decades both in terms of theory and implementations; hence it deserves a thorough treatment which is not adequately found in any other contemporary books on discrete mathematics, whereas about 40% of this textbook is devoted to graph theory. The text follows an algorithmic approach for discrete mathematics and graph problems where applicable, to reinforce learning and to show how to implement the concepts in real-world applications.

*The Fascinating World of Graph Theory* Courier Corporation

Good graphs make complex problems clear. From the weather forecast to the Dow Jones average, graphs are so ubiquitous today that it is hard to imagine a world without them. Yet they are a modern invention. This book is the first to comprehensively plot humankind's fascinating efforts to visualize data, from a key seventeenth-century precursor--England's plague-driven initiative to register vital statistics--right up to the latest advances. In a highly readable, richly illustrated story of invention and inventor that mixes science and politics, intrigue and scandal, revolution and shopping, Howard Wainer validates Thoreau's observation that circumstantial evidence can be quite convincing, as when you find a trout in the milk. The story really begins with the eighteenth-century origins of the art, logic, and methods of data display, which emerged, full-grown, in William Playfair's landmark 1786 trade atlas of England and Wales. The remarkable Scot singlehandedly popularized the atheoretical plotting of data to reveal suggestive patterns--an achievement that foretold the graphic explosion of the nineteenth century, with atlases published across the observational sciences as the language of science moved from words to pictures. Next come succinct chapters illustrating the uses and abuses of this marvelous invention more recently, from a murder trial in Connecticut to the Vietnam War's effect on college admissions. Finally Wainer examines the great twentieth-century polymath John Wilder Tukey's vision of future graphic displays and the resultant methods--methods poised to help us make sense of the torrent of data in our information-laden world.

*An Introduction to Discrete Mathematics* Princeton University Press

This book provides an introduction to discrete mathematics. At the end of the book the reader should be able to answer counting questions such as: How many ways are there to stack  $n$  poker chips, each of which can be red, white, blue, or green, such that each red chip is adjacent to at least 1 green chip? The book can be used as a textbook for a semester course at the sophomore level. The first five chapters can also serve as a basis for a graduate course for in-service teachers.

*Graph Theory* Routledge

With a growing range of applications in fields from computer science to chemistry and communications networks, graph theory has enjoyed a rapid increase of interest and widespread recognition as an important area of mathematics. Through more than 20 years of publication, *Graphs & Digraphs* has remained a popular point of entry to the field, and through its various editions, has evolved with the field from a purely mathematical treatment to one that also addresses the mathematical needs of computer scientists. Carefully updated, streamlined, and enhanced with new features, *Graphs & Digraphs, Fourth Edition* reflects many of the developments in graph theory that have emerged in recent years. The authors have added discussions on topics of increasing interest, deleted outdated material, and judiciously augmented the Exercises sections to cover a range of problems that reach beyond the construction of proofs. New in the Fourth Edition: Expanded treatment of Ramsey theory Major revisions to the material on domination and distance New material on list colorings that includes interesting recent results A solutions manual covering many of the exercises available to instructors with qualifying course adoptions A comprehensive bibliography including an updated list of graph theory books Every edition of *Graphs & Digraphs* has been unique in its reflection of the subject as one that is important, intriguing, and most of all beautiful. The fourth edition continues that tradition, offering a comprehensive, tightly integrated, and up-to-date introduction that imparts an appreciation as well as a solid understanding of the material.

*Fundamental Approach To Discrete Mathematics* McGraw-Hill College

Salient Features \* Mathematical Logic, Fundamental Concepts, Proofs And Mathematical Induction (Chapter 1) \* Set Theory, Fundamental Concepts, Theorems, Proofs, Venn Diagrams, Product Of Sets, Application Of Set Theory And Fundamental Products (Chapter 2) \* An Introduction To Binary Relations And Concepts, Graphs, Arrow Diagrams, Relation Matrix, Composition Of Relations, Types Of Relation, Partial Order Relations, Total Order Relation, Closure Of Relations, Poset, Equivalence Classes And Partitions. (Chapter 3) \* An Introduction To Functions And Basic Concepts, Graphs, Composition Of Functions, Floor And Ceiling Function, Characteristic Function, Remainder Function, Signum Function And Introduction To Hash Function. (Chapter 4) \*

The Algebraic Structure Includes Group Theory And Ring Theory. Group Theory Includes Group, Subgroups, Cyclic Group, Cosets, Homomorphism, Introduction To Codes And Group Codes And Error Correction For Block Code. The Ring Theory Includes General Definition, Fundamental Concepts, Integral Domain, Division Ring, Subring, Homomorphism, An Isomorphism And Pigeonhole Principle (Chapters 5, 6 And 7) \* A Treatment Of Boolean Algebras That Emphasizes The Relation Of Boolean Algebras To Combinatorial Circuits. (Chapter 8) \* An Introduction To Lattices And Basic Concepts (Chapter 9) \* A Brief Introduction To Graph Theory Is Discussed. Elements Of Graph Theory Are Indispensable In Almost All Computer Science Areas. Examples Are Given Of Its Use In Such Areas As Minimum Spanning Tree, Shortest Path Problems (Dijkstra'S Algorithm And Floyd-Warshall Algorithm) And Traveling Salesman Problem. The Computer Representation And Manipulation Of Graphs Are Also Discussed So That Certain Important Algorithms Can Be Included(Chapters 10 And 11) \* A Strong Emphasis Is Given On Understanding The Theorems And Its Applications \* Numbers Of Illustrations Are Used Throughout The Book For Explaining The Concepts And Its Applications. \* Figures And Tables Are Used To Illustrate Concepts, To Elucidate Proofs And To Motivate The Material. The Captions Of These Figures Provide Additional Explanation. Besides This, A Number Of Exercises Are Given For Practice

*A Transition to Advanced Mathematics* Springer

A TRANSITION TO ADVANCED MATHEMATICS, 7e, International Edition helps students make the transition from calculus to more proofs-oriented mathematical study. The most successful text of its kind, the 7th edition continues to provide a firm foundation in major concepts needed for continued study and guides students to think and express themselves mathematically—to analyze a situation, extract pertinent facts, and draw appropriate conclusions. The authors place continuous emphasis throughout on improving students' ability to read and write proofs, and on developing their critical awareness for spotting common errors in proofs. Concepts are clearly explained and supported with detailed examples, while abundant and diverse exercises provide thorough practice on both routine and more challenging problems. Students will come away with a solid intuition for the types of mathematical reasoning they'll need to apply in later courses and a better understanding of how mathematicians of all kinds approach and solve problems.

**Essential Discrete Mathematics for Computer Science**

Princeton University Press

Susanna Epp's DISCRETE MATHEMATICS: AN INTRODUCTION TO MATHEMATICAL REASONING, provides the same clear introduction to discrete mathematics and mathematical reasoning as her highly acclaimed DISCRETE MATHEMATICS WITH APPLICATIONS, but in a compact form that focuses on core topics and omits certain applications usually taught in other courses. The book is appropriate for use in a discrete mathematics course that emphasizes essential topics or in a mathematics major or minor course that serves as a transition to abstract mathematical thinking. The ideas of discrete mathematics underlie and are essential to the science and technology of the computer age. This book offers a synergistic union of the major themes of discrete mathematics together with the reasoning that underlies mathematical thought. Renowned for her lucid, accessible prose, Epp explains complex, abstract concepts with clarity and precision, helping students develop the ability to think abstractly as they study each topic. In doing so, the book provides students with a strong foundation both for computer science and for other upper-level mathematics courses. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

*Asymptotics and Applications (AM-164)* Cambridge University Press

Written by two prominent figures in the field, this comprehensive text provides a remarkably student-friendly approach. Its sound yet accessible treatment emphasizes the history of graph theory and offers unique examples and lucid proofs. 2004 edition.

*Discrete Mathematics: Introduction to Mathematical Reasoning* Math Classics

This book prepares students for the more abstract mathematics courses that follow calculus. The author introduces students to proof techniques, analyzing proofs, and writing proofs of their own. It also provides a solid introduction to such topics as relations, functions, and cardinalities of sets, as well as the theoretical aspects of fields such as number theory, abstract algebra, and group theory.