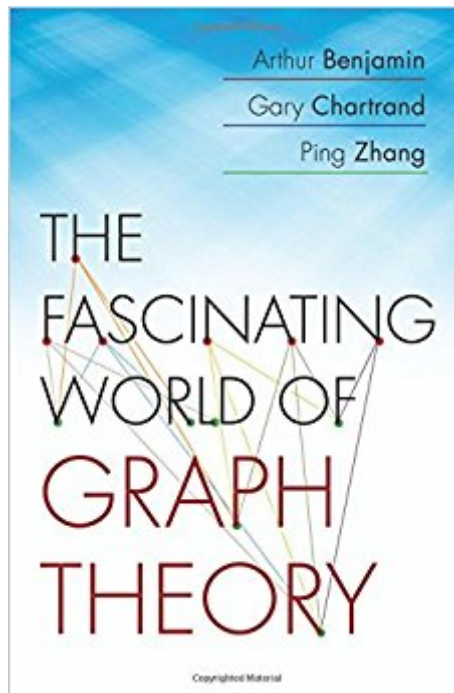




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The Fascinating World Of Graph Theory



Synopsis

The fascinating world of graph theory goes back several centuries and revolves around the study of graphs--mathematical structures showing relations between objects. With applications in biology, computer science, transportation science, and other areas, graph theory encompasses some of the most beautiful formulas in mathematics--and some of its most famous problems. For example, what is the shortest route for a traveling salesman seeking to visit a number of cities in one trip? What is the least number of colors needed to fill in any map so that neighboring regions are always colored differently? Requiring readers to have a math background only up to high school algebra, this book explores the questions and puzzles that have been studied, and often solved, through graph theory. In doing so, the book looks at graph theory's development and the vibrant individuals responsible for the field's growth. Introducing graph theory's fundamental concepts, the authors explore a diverse plethora of classic problems such as the Lights Out Puzzle, the Minimum Spanning Tree Problem, the Königsberg Bridge Problem, the Chinese Postman Problem, a Knight's Tour, and the Road Coloring Problem. They present every type of graph imaginable, such as bipartite graphs, Eulerian graphs, the Petersen graph, and trees. Each chapter contains math exercises and problems for readers to savor. An eye-opening journey into the world of graphs, this book offers exciting problem-solving possibilities for mathematics and beyond.

Book Information

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Customer Reviews

Are you a theoretical mathematician? If you are, then this book is for you. Authors Arthur Benjamin, Gary Chartrand and Ping Zhang, have written an outstanding book that introduces you to one of the many remarkable areas of mathematics: Graph Theory. The authors begin with some curious

problems--all of which can be looked at mathematically by means of the main concept of this book: graphs. Next, they discuss theorems from many areas of mathematics that have been judged among the most beautiful. Then, the authors describe the most fundamental property that a graph can possess, by dealing with the idea that within the graph, travel is possible between every two locations. Also, the authors provide the simplest structure that a connected graph can possess, leading the reader to the class of graphs called trees, because they often look like trees. They then doodle with a well-known problem: The Chinese Postman Problem, which deals with minimizing the length of a round trip that a letter carrier might take. Then, the authors discuss a class of graphs named for a famous physicist and mathematician of the nineteenth century: Sir William Rowan Hamilton. In addition, through graph theory, they explain how different types of scheduling are possible. Also, the authors then explain problems of whether a graph can be divided into certain other kinds of graphs, primarily cycles. They then discuss how various voting techniques can result in often surprising outcomes. Next, the authors continue by looking at interesting problems that can be drawn in the plane without any of their edges crossing. Then, they discuss the Four Color Problem: Famous not only for the length of time it took to solve, but for the controversial method that is used to solve it.

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