Sphere Packing, Lewis Carroll and Reversi (New Martin Gardner Mathematical Library)

Martin Gardner
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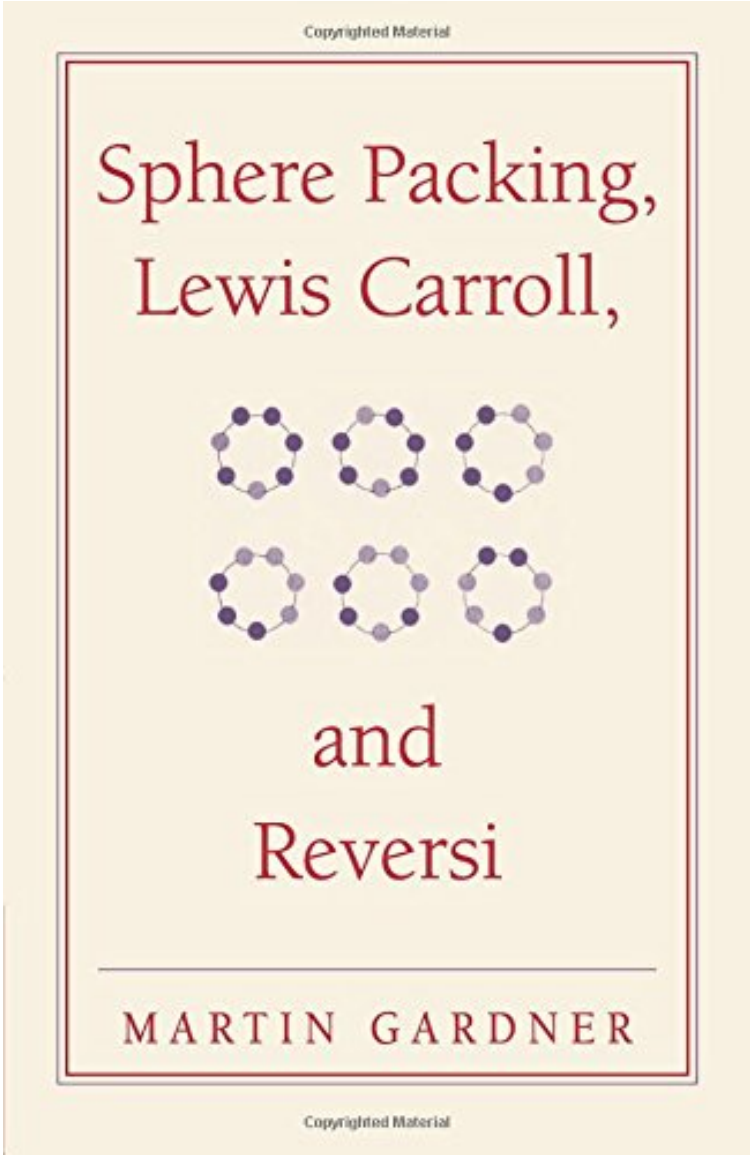

#1379603 in Books Martin Gardner 2009-07-06 2009-09-17Original language:EnglishPDF # 1 8.50 x .67 x 5.43l, .76 #File Name: 0521747015296 pagesSphere Packing Lewis Carroll and Reversi | File size: 56.Mb

Martin Gardner : Sphere Packing, Lewis Carroll and Reversi (New Martin Gardner Mathematical Library) before purchasing it in order to gage whether or not it would be worth my time, and all praised Sphere Packing, Lewis Carroll and Reversi (New Martin Gardner Mathematical Library):

1 of 1 people found the following review helpful. Sphere Packing, Lewis Carroll and Reversi (New Martin Gardner

Mathematical Library)By Gene SheppardIf you like Martin Gardner, then no more need be said.If you do not know Charles Lutwidge Dodgson (a.k.a. Lewis Carroll) was a mathematician, logician and photographer you should read this book.This is a book for people who enjoy math conundrums and physical puzzles in general. For example:-Do you know how to pack a box efficiently with spheres?-What is the best way to play Reversi?-Have you ever read a Lewis Carroll puzzle?Gardner is at his best entertaining us while showing us how to solve puzzles.3 of 4 people found the following review helpful. A Martin Gardner ClassicBy Kenneth BergAn excellent collection of Martin Gardner's columns from Scientific American. I have several of Gardner's books, and this particular series is the best production quality of the ones that I own.14 of 14 people found the following review helpful. Amusements, Surprises, Mysteries, Challenges!By Peter RenzAmusements, Surprises, Mysteries, Challenges!Mathematics sometimes seems a matter of abstract symbols and calculations. Not in this book. Here it comes to life. Every chapter is filled with things to make or draw or think about. As you do these things, you learn what is going on and develop mathematics on your own.Gardner leads off with the binary system and binary sorting, illustrated by use of a sorting deck similar to the commercial McBee Keysort system. Next, group theory is introduced via a game and illustrated by braiding leading to the "Dirac Belt Trick." This trick is the basis for a way to connect hoses and cords to rotating machinery and to avoid tangles. Dirac was interested in this trick because of its implications for the spins of electrons, a matter that is still a mystery to me, though I see how the trick works by trying it out as suggested.Lewis Carroll's puzzles are here, with mazes and word ladders. Gardner shows how cutting and folding paper help you understand angle sums and dissections of figures. The references for the cutting and folding chapter include the recent work of Eric and Martin Demaine, Joseph O'Rourke, Greg N. Frederickson and others, useful if you want more technical details.Senet opens the chapter on board games. This chapter winds up with a history of Reversi (and its kin Othello) which shows how tricky it can be to discover the origins of "new" games. A letter Peter Michaelsen sent Gardner in 1987 suggested Chinese origins for versions of this game, but those have yet to be traced and confirmed. Here is something to look into.How can circles or spheres be packed most efficiently in a given area or volume? Sphere Packing is one of the greatest puzzles and most beautiful areas of geometry. Kepler conjectured that a hexagonal close packing is the densest packing in space - and Thomas Hales gave a proof in 1998, using computers to show that other arrangements are less efficient. From Martin Gardner's comments about this proof and the proof of the Four Color Map Theorem and the nonexistence of an order 10 projective plane (see Chapters 10 and 14 of this book), I see that he has doubts about trustworthiness of proofs that depend on computations. Calculations can go awry, but the drive to check and recheck important results works for computer work as well as it does for standard proofs. Hales has given a convincing account of his efforts and those of others to check his proof of the Kepler Conjecture (See [...]).It is important to reexamine accepted proofs and calculations. An example from this book shows why. Percy Alexander MacMahon considered puzzles involving the 24 colored squares you get by quartering squares by their diagonals and then coloring them in every possible way using three colors (say, black, gray, and white). It is a nice exercise to count these 24 possibilities. Martin Gardner takes these squares up in Chapter 16. A rich array of possibilities arises if you try to arrange these squares in a 4 x 6 rectangle so that the outer edge is black and so that the colors match where the squares meet.This is a reasonable challenge, not too easy and not too hard. Once you have succeeded, you might wonder how many different arrangements of this sort there are. From the first edition of this book, I recalled that there were roughly 12,000 such solutions to the 4 x 6 rectangle. This is based on a hand count of 12,224 made by Federico Fink of Buenos Aires in 1963, followed by computer search done at Stanford in 1964 by Gary Feldman, which gave a total of 12,261, a small increase possibly from a more systematic job. In 1977 Hilario Fernandez Long of Buenos Aires wrote Gardner to report a second computer search that found 13,328 solutions for the 4 x 6 rectangle. This raises concerns. How to square these varying results? For me, the more recent result being larger by 8% suggests that certain possibilities were overlooked, or that some duplication has arisen. Questions arise when there are discrepancies, as we see here. I am not completely satisfied with any of these numbers yet. I await further evidence. Whether the work is done by computer or by hand we look for confirmation by agreement with earlier work. Perhaps some of you will sort this out. The task is not as unmanageable as it might seem.If the border of the 4 x 6 rectangle of MacMahon squares is black, then there must be a bar of four squares meeting with black edges and joining the sides of length six. Gardner cites T. H. O'Bierne proof of this. Looking further, toward the end of Winning Ways for Your Mathematical Plays by Berlekamp, Conway, and Guy there is a list the 20 possible patterns for the black edges on the interior of a 4 x 6 MacMahon rectangle whose edges are black. Using this as a basis, the enumeration of all such rectangles would be simplified. See Volume 2 of the 1982 first edition of Berlekamp, Conway, Guy or Volume 4 of the second edition (A K Peters, 2004).A neat surprise is the slice of a torus that gives two intersecting circles (Chapter 12, Problem 4). I wondered how to show that these seeming circles were really circles. A bit of searching led to Eric Weisstein's MathWorld article on the Torus ([...]). Fairly far down on this MathWorld page you will see how these circles look at a point on the torus where the two Villarceau circles (as they are called) lie in separate planes. Weisstein also cites Coxeter's Introduction to Geometry, a beautiful book and the subject of Chapter 17 of the book under review. In Coxeter's book you will find an analytic proof of the properties of these circles (and a citation of Gardner's column).In Chapter 9 you meet Victor Eigen, the first mathemagician, a word Gardner coined for practitioners of magical tricks based on

mathematical principles. The Gilbreath Principle is explained here, the basis for many magical effects. A long-awaited book by Persi Diaconis and Ron Graham from Princeton University Press is expected to be the word on mathemagic.I had a hand in the work on this new edition, checking some developments and redoing a few illustrations. I thought that there would be few surprises when I saw the book itself, but I found many things that I had missed earlier or had not thought about enough. For example, the discrepancies in the MacMahon squares counts mentioned above. The good news is that there are things to be done and thought about, and that is the whole idea of these books!Get a copy and go for it.

Packing spheres, Reversi, braids, polyominoes, board games, and the puzzles of Lewis Carroll. These and other mathematical diversions return to readers with updates to all the chapters, including new game variations, proofs, and other developments and discoveries. Read about Knuth's Word Ladders program and the latest developments in the digits of pi. Once again these timeless puzzles will charm readers while demonstrating principles of logic, probability, geometry, and other fields of mathematics. It's the perfect stocking stuffer for the puzzle wizard on your list.

"In this collection of 20 reprints of his "Mathematical Games" columns from 1959 and 1961 issues of Scientific American, Gardner shares his delight in recreational math. The renowned mathematics and science writer presents concepts exemplified by board games and puzzles by the author of Alice in Wonderland and others, with solutions, updated information, and references. Among Gardener's many books is The Annotated Alice. Published in association with the Mathematical Association of America." Book News"While Martin Gardner has always called himself "strictly a journalist," he should really be honored as one of this country's greatest cultural treasures." The Washington Post For the full text visit: http://www.washingtonpost.com/wp-dyn/content/article/2009/10/21/AR2009102103700.htmlAbout the AuthorFor 25 of his 90 years, Martin Gardner wrote 'Mathematical Games and Recreations,' a monthly column for Scientific American magazine. These columns have inspired hundreds of thousands of readers to delve more deeply into the large world of mathematics. He has also made significant contributions to magic, philosophy, debunking pseudoscience, and children's literature. He has produced more than 60 books, including many best sellers, most of which are still in print. His Annotated Alice has sold more than a million copies. He continues to write a regular column for the Skeptical Inquirer magazine.