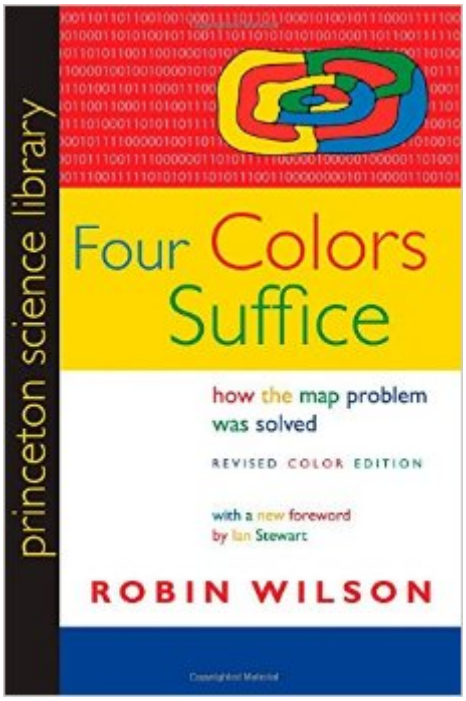
Four Colors Suffice: How The Map Problem Was Solved (Princeton Science Library)



Synopsis

On October 23, 1852, Professor Augustus De Morgan wrote a letter to a colleague, unaware that he was launching one of the most famous mathematical conundrums in history--one that would confound thousands of puzzlers for more than a century. This is the amazing story of how the "map problem" was solved.The problem posed in the letter came from a former student: What is the least possible number of colors needed to fill in any map (real or invented) so that neighboring counties are always colored differently? This deceptively simple question was of minimal interest to cartographers, who saw little need to limit how many colors they used. But the problem set off a frenzy among professional mathematicians and amateur problem solvers, among them Lewis Carroll, an astronomer, a botanist, an obsessive golfer, the Bishop of London, a man who set his watch only once a year, a California traffic cop, and a bridegroom who spent his honeymoon coloring maps. In their pursuit of the solution, mathematicians painted maps on doughnuts and horseshoes and played with patterned soccer balls and the great rhombicuboctahedron. It would be more than one hundred years (and countless colored maps) later before the result was finally established. Even then, difficult questions remained, and the intricate solution--which involved no fewer than 1,200 hours of computer time--was greeted with as much dismay as enthusiasm.Providing a clear and elegant explanation of the problem and the proof, Robin Wilson tells how a seemingly innocuous question baffled great minds and stimulated exciting mathematics with far-flung applications. This is the entertaining story of those who failed to prove, and those who ultimately did prove, that four colors do indeed suffice to color any map.This new edition features many color illustrations. It also includes a new foreword by Ian Stewart on the importance of the map problem and how it was solved.

Book Information

Series: Princeton Science Library
Paperback: 224 pages
Publisher: Princeton University Press; Revised Color edition with a New foreword by Ian Stewart edition (November 10, 2013)
Language: English
ISBN-10: 0691158223
ISBN-13: 978-0691158228
Product Dimensions: 6.1 x 0.5 x 9.3 inches
Shipping Weight: 11.4 ounces (View shipping rates and policies)

Average Customer Review: 5.0 out of 5 starsÂ Â See all reviewsÂ (2 customer reviews)
Best Sellers Rank: #899,450 in Books (See Top 100 in Books) #114 inÂ Books > Science & Math > Mathematics > Applied > Graph Theory #142 inÂ Books > Science & Math > Earth Sciences > Cartography #784 inÂ Books > Science & Math > Mathematics > History

Customer Reviews

I’m no fan of history, normally, but Wilson has done what so vanishingly few others ever have: he actually makes it interesting. He first defines the Four Color Conjecture, as it was known for over a century. Start with a map drawn on a plane. The conjecture says that it takes just four colors to fill it in, such that regions with shared boundaries are different colors. A kindergartener can understand it, and maybe eve have a bit of fun trying to come up with such colorings for simple maps. Rigorous mathematical proof of the statement took over 125 years, though - and then, the proof called into question just what a mathematical proof really is.The final answer didn’t come in an "Aha!" flash, with some mathematical loner suddenly grabbing his chalk arcane symbols on a blackboard. Wilson brings to life the gradual, cumulative process of developing proof techniques. The bounds changed, too: a proof that no more than five colors would be needed, then successive proofs increasing the number of regions in four-colorable maps.The step from five to four colors, however, is just as big as the step from any finite number of regions to maps of infinite complexity.Then, in the 1970s, Appel and Haken cracked it: Four Colors Suffice. The famous problem had fallen - or had it? Their proof was long, though not the longest on record, so any claim of proof should wait for independent review - errors can creep into any human construction, after all. But it also involved hundreds of hiours of supercomputer time, checking over a thousand special cases. I remember, at the time, some people complaining that using a program without proving the program’s correctness is no proof at all - not necessarily true, if each result can be hand-checked.

Infinite (Princeton Science Library) Princeton Readings in Islamist Thought: Texts and Contexts from al-Banna to Bin Laden (Princeton Studies in Muslim Politics) The Princeton Field Guide to Dinosaurs: Second Edition (Princeton Field Guides) How to Solve It: A New Aspect of Mathematical Method (Princeton Science Library) "e:" The Story of a Number (Princeton Science Library) The Meaning of Relativity: Including the Relativistic Theory of the Non-Symmetric Field, Fifth Edition (Princeton Science Library) The Nature of Space and Time (Princeton Science Library) Primates and Philosophers: How Morality Evolved (Princeton Science Library) Streetwise Central Park Map - Laminated Pocket Map of Manhattan Central Park, New York for Travel Streetwise Manhattan Bus Subway Map - Laminated Metro Map of Manhattan, New York - Pocket Size (Streetwise Maps) Streetwise Paris Map - Laminated City Center Street Map of Paris, France Puerto Rico (Adventure Travel Map) (National Geographic Adventure Map) Streetwise Madrid Map - Laminated City Center Street Map of Madrid, Spain Streetwise Edinburgh Map - Laminated City Center Street Map of Edinburgh, Scotland (Streetwise (Streetwise Maps))