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# Euclidean And Non-Euclidean Geometries

# Synopsis

This is the definitive presentation of the history, development and philosophical significance of non-Euclidean geometry as well as of the rigorous foundations for it and for elementary Euclidean geometry, essentially according to Hilbert. Appropriate for liberal arts students, prospective high school teachers, math. majors, and even bright high school students. The first eight chapters are mostly accessible to any educated reader; the last two chapters and the two appendices contain more advanced material, such as the classification of motions, hyperbolic trigonometry, hyperbolic constructions, classification of Hilbert planes and an introduction to Riemannian geometry.

# Book Information

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# Customer Reviews

This is a full-fledged math text that I picked up on discount back when I was working at Bay Tree Bookstore in Santa Cruz. Yes, it's taken me over ten years to finally getting around to reading it. What finally worked for me is the realization that, since I'm not taking it for a class, I don't have to do the problems at the end of each chapter. That finally allowed me to read the book in comfort, as if I were auditing a class.This book starts with Euclid's first axioms and leads you through the whys and

whos of the development of non-Euclidean geometry. First, you get a complete re-introduction to Euclidean geometry itself, which is very handy and leads you directly to later developments. The unprovability of the Parallel Postulate (Euclid's Axiom V) reminded me of the Ultraviolet Catastrophe in physics/chemistry history, and Greenberg shows the motivating effect this had on the mathematics community. Unfortunately, the problem wasn't solved in a matter of decades, as with the Catastrophe, and mathematicians poked at the Parallel Postulate as if it were a sore tooth for hundreds of years before they realized that the REALLY interesting results happened when you discarded the Postulate altogether. In fact, one of the most heartbreaking sections of the book is Greenberg's description of Girolamo Saccheri's work in the 17th century. Saccheri had discovered a type of quadrilateral that seemed able to have acute summit angles and right base angles at the same time. These are perfectly possible in what's now known as hyperbolic geometry, but the only geometry known in Saccheri's time, Euclidean geometry, made no allowances for such a strange creature. Instead of realizing what he was looking at, Saccheri abandoned this line of inquiry in disgust.

I had the pleasure of reading and studying the Second Edition of this text while in college. This course with this text was my favorite course during all of my undergraduate math courses.Being a fan of the subject, I was eager to see the new Fourth Edition of the text. The Fourth Edition is quite expanded from earlier editions, going past the wonderful main story of the Parallel Postulate - told better by Greenberg than any other author, IMHO - and diving into the different non-Euclidean geometries that "open one's eyes" by setting aside the "obvious axiom of a unique parallel". The last chapters are greatly enhanced, with a superb presentation of the issue of straightedge and compass constructions in the Hyperbolic plane.This presentation of Non-Euclidean geometry is more serious than the "popularized" books on advanced mathematical topics. If you're looking for a "light, fun" reading of this topic, this is not the book for you.I feel that the real power of the story of the maturing of intellectual thought, so brilliantly portrayed in the story of the Parallel Postulate, must be experienced, through the effort (and often hard work) of actually **doing** geometry, rather than just reading lightly about it. If you want to dive in and actual experience geometry (and the consequent rewards), then this is the book for you. The explanations are magnificent, the problems are wonderful (and, at times, very challenging), all culminating in the "wow!" of modifying the Euclidean way of thinking to a new and beautiful alternate geometrical universe.As other reviewers have noted, this text reads like a great novel - a drama involving geometry. If PBS/Nova ever make a "What does Parallel mean anyway?" show, this text will be the basis for that show.

Euclidean and Non-Euclidean Geometries: Development and History Geometry by Construction: Object Creation and Problem-solving in Euclidean and Non-Euclidean Geometries Euclidean and Non Euclidean Geometries Development and History 4th (Fourth) Edition byGreenberg Euclidean and Non-Euclidean Geometries Modern Geometries: Non-Euclidean, Projective, and Discrete Geometry (2nd Edition) Euclidean And Non-Euclidean Geometry::Development and History, 4th edition.[Hardcover,2007] Non Fiction Writing Templates: 44 Tips to Create Your Own Non Fiction Book (Writing Templates, Writing Non Fiction, Kindle Publishing) The Fourth Dimension and Non-Euclidean Geometry in Modern Art (Leonardo Book Series) The Foundations of Geometry and the Non-Euclidean Plane (Undergraduate Texts in Mathematics) Non-Euclidean Adventures on the Lénárt Sphere Taxicab Geometry: An Adventure in Non-Euclidean Geometry (Dover Books on Mathematics) Non-Euclidean Geometry for Babies (Math for Babies) Non-Euclidean Geometry (Dover Books on Mathematics) Non-Euclidean Geometry (Mathematical Association of America Textbooks) The elements of non-Euclidean geometry Geometries, Groups and Algebras in the Nineteenth Century - A History The Practical Tao Te Ching of Lao-zi: Rational Meditations on Non-duality, Impermanence, Wu-wei (non-striving), Nature and Naturalness, and Virtue GMO Free Diet: The Ultimate Guide on Avoiding GMO Foods and keeping Your Family Healthy with a GMO Free Diet (GMO, Non GMO Diet, Non GMO Foods, Genetically Engineered Foods, Monsanto) On Literature and Philosophy: The Non-Fiction Writing of Naguib Mahfouz: Volume 1 (Non-Fiction Writings of Naguib Mahfouz) Eco-Friendly Cleaning: Money Saving Solutions for a Clean, Green, All-Natural, Non-Toxic, Eco-Friendly Home (eco-friendly, sustainability, homesteading, ... natural cleaning, green home, non-toxic)