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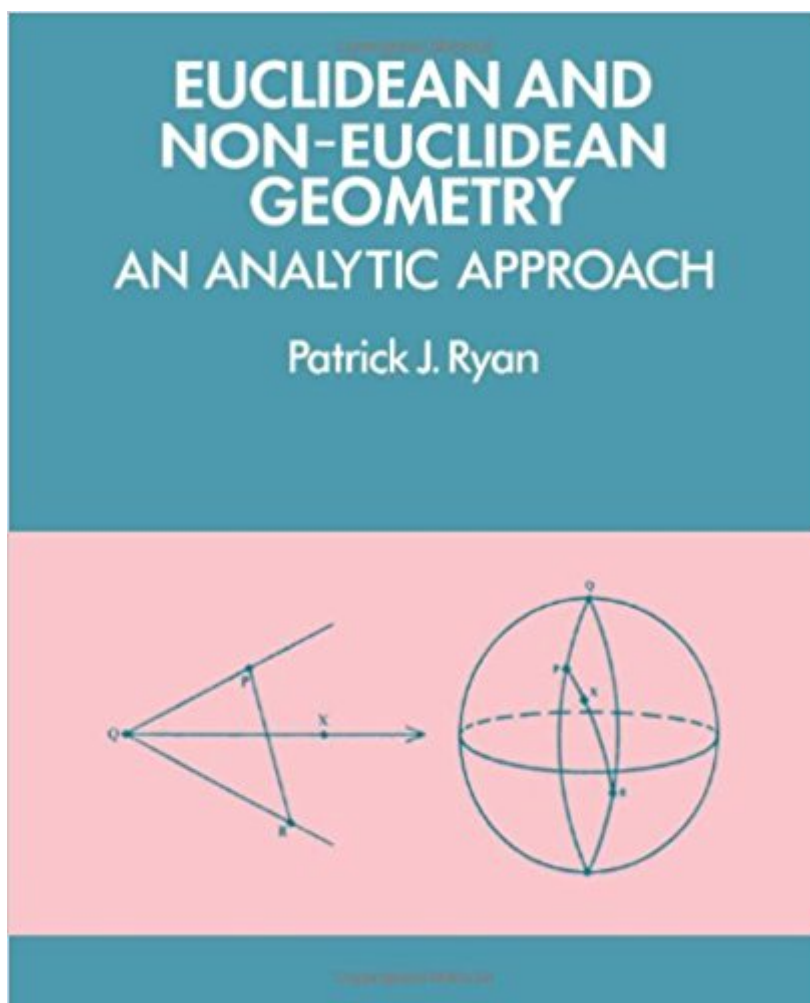# Euclidean And Non-Euclidean Geometry: An Analytic Approach

EUCLIDEAN AND NON-EUCLIDEAN GEOMETRY
AN ANALYTIC APPROACH

Patrick J. Ryan

Synopsis

This book gives a rigorous treatment of the fundamentals of plane geometry: Euclidean, spherical, elliptical and hyperbolic. The primary purpose is to acquaint the reader with the classical results of plane Euclidean and nonEuclidean geometry, congruence theorems, concurrence theorems, classification of isometries, angle addition and trigonometrical formulae. However, the book not only provides students with facts about and an understanding of the structure of the classical geometries, but also with an arsenal of computational techniques for geometrical investigations. The aim is to link classical and modern geometry to prepare students for further study and research in group theory, Lie groups, differential geometry, topology, and mathematical physics. The book is intended primarily for undergraduate mathematics students who have acquired the ability to formulate mathematical propositions precisely and to construct and understand mathematical arguments. Some familiarity with linear algebra and basic mathematical functions is assumed, though all the necessary background material is included in the appendices.

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Customer Reviews

"An elegant geometry text...the whole very crisply printed and illustrated. Good exercises and helpful references." SciTech Book News"...a thoughtful, carefully crafted textbook..." Science Books & Films"The exposition is lucid; the body of the text and exercises are thoughtfully organized...The book should be brought to the attention of instructors wishing for a fresh outlook..." American Scientist"In his introduction the author expresses the hope that he can instill good working attitudes

that will help students go on to research in group theory, Lie groups, differential geometry and topology. The naturalness and sophistication of his development go far to fulfilling his aim...The book is produced to a very high standard. Both graphics and text are exceptionally clear." The Mathematical Gazette

A thorough analysis of the fundamentals of plane geometry The reader is provided with an abundance of geometrical facts such as the classical results of plane Euclidean and non-Euclidean geometry, congruence theorems, concurrence theorems, classification of isometries, angle addition, trigonometrical formulas, etc.

Most of us who had geometry in school had it done in a purely axiomatic way, basically the way Euclid did it, though updated. This book achieves an exposition of geometry (not only Euclidean, but the non-Euclidean geometries referred to as elliptic and hyperbolic) through other means. The subtitle, "An Analytic Approach" is only a partial explanation of the way the book approaches geometry. Not only the representation of points by coordinates, which is what "analytic" means in a geometric context, is characteristic of the book, but a heavy reliance is made on group theory and linear algebra.There are other books whose titles are, or include, the terms "transformational geometry." This refers to the concept of the 19th-century German mathematician Felix Klein that a geometry is best considered as a study of those aspects of spaces that are preserved by a set of transformations applied to them. This book, with its heavy dependence on group theory (the mathematics that describes how transformations interact with each other) and linear algebra (the way that analytic geometry deals with transformations), clrarly falls within the family of transformational geometry books, even if the title does not use the word "transformational."Such subtypes of geometry as affine plane geometry and distance geometry are also well covered. In fact, the book has one of the best treatments of affine geometry i have encountered.Because of the use of such tools as linear algebra, this book is not appopriate for a high-school student; it is best used by someone with a few years of college mathematics. that is probably the one caveat I would raise.

This is so rigorous it is only for the advanced mathematician. I was looking for something much more accessible. I'll have to keep looking.

Patrick Ryan's book on Geometry is not too advanced, give a good introduction, and importantly

avoids pedantry and excessive abstraction. At the same time, the notation could be made much more clear, the examples could be better, and there could be much more depth to the book while still keeping it accessible.However, I do like the organization of the book by kind of Geometry, and comparisons and contrasts between the different geometries in the introduction for each section. But given that I am not a visual thinker, I at least would have preferred more diagrams and explanations about how to think about these topics.It is a solid book, and not too rigorous, although the notation at times makes it more confusing than it should be, but I am sure that there are much better books out there.

I admit I am more comfortable with the logical, formal exposition of geometry. This book clashes with that background, being more algebraic in its approach. I find myself feeling that I am missing crucial pieces of the puzzle.It also has a common flaw of math books in that it uses that ATROCIOUS swirly font for some of the symbols. You probably know the one I mean--so elaborate with delicate swoops and curlicues that I honestly can't tell which letter it is half the time even after several seconds of squinting. When a symbol is just as likely to be J, I, S, A, G, or T, it is a pain in the neck to have to go to pattern-matching from scratch instead of using letter recognition. It makes it harder to recognize and remember formulas and definitions.

great book

Book good

good service. i recommend

This book about euclidean and non-euclidean geometry is great! A must for researh or math class!

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