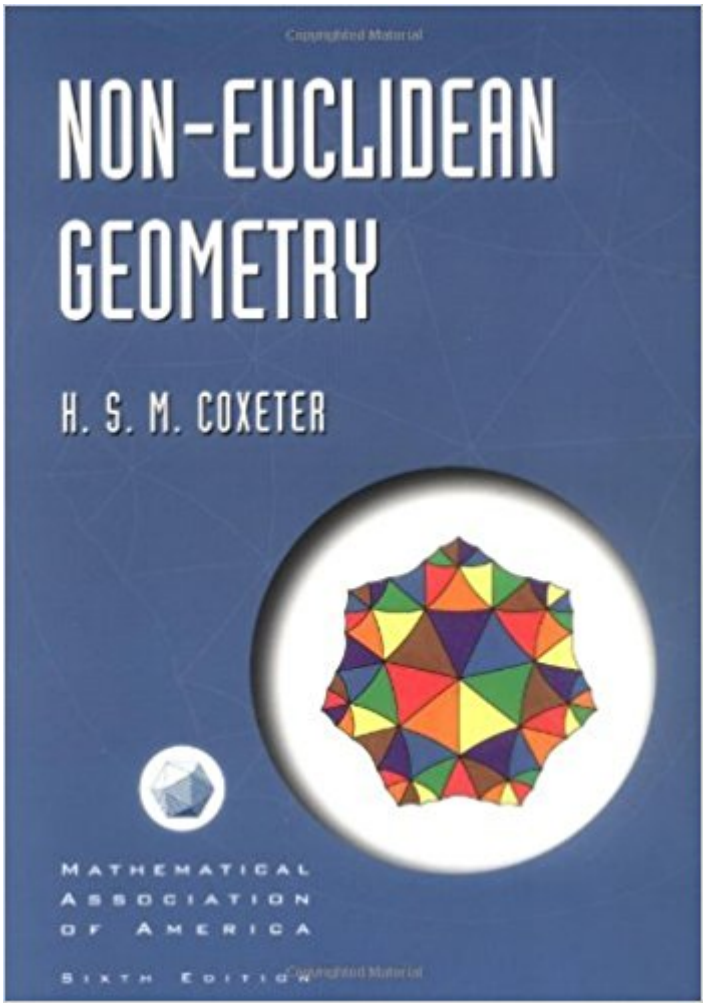
Non-Euclidean Geometry (Mathematical Association Of America Textbooks)



Synopsis

This is a reissue of Professor Coxeter’s classic text on non-Euclidean geometry. It begins with a historical introductory chapter, and then devotes three chapters to surveying real projective geometry, and three to elliptic geometry. After this the Euclidean and hyperbolic geometries are built up axiomatically as special cases of a more general ’descriptive geometry’. This is essential reading for anybody with an interest in geometry.

Book Information

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Customer Reviews

’No living geometer writes more clearly and beautifully about difficult topics than world famous Professor H. S. M. Coxeter. When non-Euclidean geometry was first developed, it seemed little more than a curiosity with no relevance to the real world. Then to everyone’s amazement, it turned out to be essential to Einstein’s general theory of relativity! Coxeter’s book has remained out of print for too long. Hats off to the MAA for making this classic available once more.’ Martin Gardner’Coxeter’s geometry books are a treasure that should not be lost. I am delighted to see Non-Euclidean Geometry back in print.’ Doris Schattschneider

A reissue of Professor Coxeter’s classic text on non-Euclidean geometry. It surveys real projective geometry, and elliptic geometry. After this the Euclidean and hyperbolic geometries are built up axiomatically as special cases. This is essential reading for anybody with an interest in geometry.

An illuminating npresentation...a classic!

A classic on the subject

Masterful treatment of Non-Euclidean concepts, including a rare "tour de force", i.e. a comprehensive and in-depth treatment of both hyperbolic and elliptic geometries.But beware, the book is difficult, highly abstract, with almost no figures and spiced with some quaternions and tensors (which may be taken in a cursory manner...).So, it’s better to absorb first Coxeter’s "The Real Projective Plane" and Greenberg’s "Euclidean & Non-Euclidean Geometries" , and only then tackle this book.This book is part of Coxeter’s geometry SUM : Introduction to Geometry, The real Projective Plane, Projective Geometry, Geometry Revisited, Non-Euclidean Geometry... to be included in the collection of anyone interested in mathematics.

In my own geometry text, I only mentioned results in elliptic geometry in passing, because they did not fit in to Hilbert’s axiomatic approach, which is the closest in spirit to Euclid’s.Coxeter, by contrast, takes projective geometry as his starting point. The beginning of his book is devoted to that. When the additional structure of a distinguished non-degenerate conic C (the "absolute") is assumed, one obtains real plane hyperbolic geometry if C is real or real plane elliptic geometry if C is imaginary. Thus a very pretty unification is achieved.In three dimensions, C is taken to be a non-degenerate quadric surface. Three dimensional elliptic space has the new phenomenon of Clifford parallel lines - difficult to visualize.

Originally published in 1942, this book has lost none of its power in the last half century. It is a commentary on the recent demise of geometry in many curricula that 33 years elapsed between the publication of the fifth and sixth editions. Fortunately, like so many things in the world, trends in mathematics are cyclic, and one can hope that the geometric cycle is on the rise. We in mathematics owe so much to geometry. It is generally conceded that much of the origins of mathematics is due to the simple necessity of maintaining accurate plots in settlements. The only book from the ancient history of mathematics that all mathematicians have heard of is the Elements by Euclid. It is one of the most read books of all time, arguably the only book without a religious theme still in widespread use over 2000 years after the publication of the first edition. The geometry taught in high schools today is with only minor modifications found in the Euclidean classic. There

are other reasons why geometry should occupy a special place in our hearts. Most of the principles of the axiomatic method, the concept of the theorem and many of the techniques used in proofs were born and nurtured in the cradle of geometry. For many centuries, it was nearly an act of faith that all of geometry was Euclidean. That annoying fifth postulate seemed so out of place and yet it could not be made to go away. Many tried to remove it, but finally the Holmsean dictum of ,"once you have eliminated the impossible, what is left, not matter how improbable, must be true", had to be admitted. There were in fact three geometries, all of which are of equal validity. The other two, elliptic and hyperbolic, are the main topics of this wonderful book. Coxeter is arguably the best geometer of this century but there can be no argument that he is the best explainer of geometry of this century. While fifty years is a mere spasm compared to the time since Euclid, it is certainly possible that students will be reading Coxeter far into the future with the same appreciation that we have when we read Euclid. His explanations of the non-Euclidean geometries is so clear that one cannot help but absorb the essentials. In so many ways, Euclidean geometry is but the middle way between the two other geometries. A point well made and in great detail by Coxeter. Geometry is a jewel that was born on the banks of the Nile river and we should treasure and respect it as the seed from which so much of our basic reasoning processes sprouted. For this reason, you should buy this book and keep a copy on your shelf. Published in Smarandache Notions Journal, reprinted with permission.

Mathematical Olympiads (Maa Problem) Thinking Geometrically: A Survey of Geometries (Mathematical Association of America Textbooks)