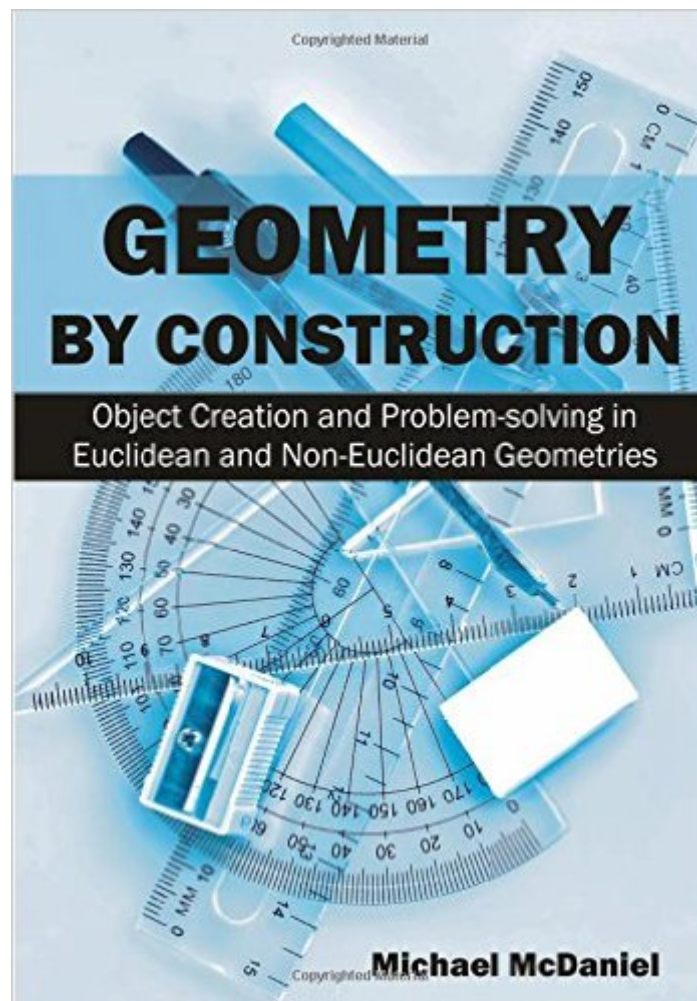


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# Geometry By Construction: Object Creation And Problem-solving In Euclidean And Non-Euclidean Geometries



## Synopsis

College geometry students, professors interested in undergraduate research and secondary geometry teachers will find three rich environments in this textbook. The first chapter contains many of the standards of Euclidean college geometry. The second and third chapters introduce non-Euclidean models where some Euclidean rules hold and others do not. With emphases on constructions and proofs, the reader is encouraged to create the objects under investigation and verify the results with reasoning. Since both models of "bent" spaces exist in Euclidean geometry, the reader gains facility with Euclidean moves through the whole book, even while exploring non-Euclidean spaces. The book itself is meant to be unpacked, expanded and taken further, just like the problems it contains. Geometry by Construction challenges its readers to participate in the creation of mathematics. The questions span the spectrum from easy to newly-published research and so are appropriate for a variety of students and teachers. From differentiation in a high school course through college classes and into summer research, any interested geometer will find compelling material. Teachers and professors might especially appreciate the way constructions provide open-ended questions which resist internet searches for solutions. College students should find the five refereed results from undergraduates like themselves encouraging. The active reader joins the mathematical tradition of a laboratory being a notebook plus a compass and ruler (or a dynamic geometry program on a computer.) New ideas await exploration and here are examples!

## Book Information

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## Customer Reviews

McDaniel's Geometry by Construction will make a great addition to your college geometry course.

Whether you are teaching a geometry course or taking one, this book is definitely a must-have. This book is great for college students of varying levels of geometric understanding. Each section provides an introduction, rules for each geometry, guidance on some need-to-know constructions, and proofs for those constructions. You'll definitely want to get out your compass and straight-edge to work along as you progress through the book. Geometry by Construction does an excellent job of engaging readers in constructions, and readers who actively participate with the text will see the biggest benefit. If you're a geometry pro and already know a thing or two about hyperbolic and elliptic geometry, this book is still for you. Instead of learning the rules for the first time, it gives you a good opportunity to review those rules. And don't forget about trying out the homework/practice problems. The questions McDaniel included in this book are not your average homework problems — you cannot go out and simply find the answers online. These problems are designed to challenge readers. They require you to recall the rules you've been learning (or reviewing) and to think creatively, taking that knowledge and what you are given in the problem and using that to arrive at the solution. Besides containing challenging questions that compel readers to think more critically than required for your average geometry book, the other element that sets this book apart is the inclusion of recent discoveries in hyperbolic and elliptic geometry.

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