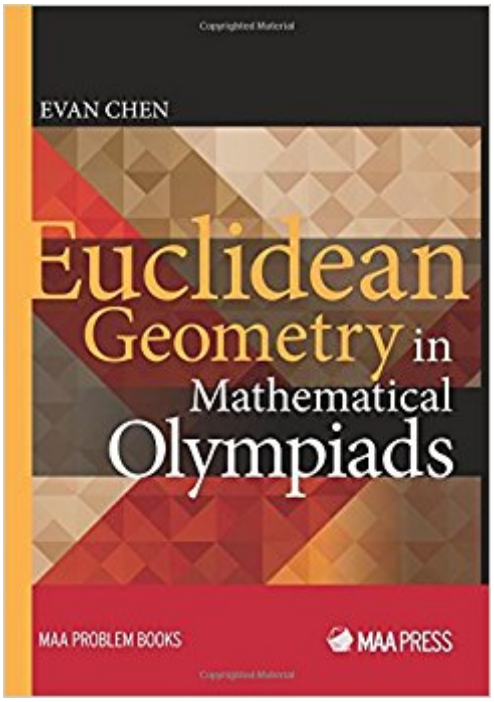
Euclidean Geometry In Mathematical Olympiads (Maa Problem)



Synopsis

This is a challenging problem-solving book in Euclidean geometry, assuming nothing of the reader other than a good deal of courage. Topics covered included cyclic quadrilaterals, power of a point, homothety, triangle centers; along the way the reader will meet such classical gems as the nine-point circle, the Simson line, the symmedian and the mixtilinear incircle, as well as the theorems of Euler, Ceva, Menelaus, and Pascal. Another part is dedicated to the use of complex numbers and barycentric coordinates, granting the reader both a traditional and computational viewpoint of the material. The final part consists of some more advanced topics, such as inversion in the plane, the cross ratio and projective transformations, and the theory of the complete quadrilateral. The exposition is friendly and relaxed, and accompanied by over 300 beautifully drawn figures. The emphasis of this book is placed squarely on the problems. Each chapter contains carefully chosen worked examples, which explain not only the solutions to the problems but also describe in close detail how one would invent the solution to begin with. The text contains as selection of 300 practice problems of varying difficulty from contests around the world, with extensive hints and selected solutions. This book is especially suitable for students preparing for national or international mathematical olympiads, or for teachers looking for a text for an honor class.

Book Information

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Customer Reviews

This is a problem book in Euclidean plane geometry, written by an undergraduate at MIT with

extensive experience in, and expertise at mathematical competitions and problem solving. The principal intended audience is students preparing for some kind of Olympiad or competition, and for such people this book should prove quite valuable. It is not only filled with a number of worked examples and lots of problems (some accompanied by solutions) but also contains discussions of general theory, specific solution techniques, and helpful advice as to when to, and when not to, apply certain methods. The book is divided into four parts. Part I ("Fundamentals") discusses a number of basic ideas that will be used repeatedly in the sequel. I hesitate to call this part of the book a "review," because many of the topics covered here (e.g., Ceva's theorem, the power of a point) might well be new to a student who has not taken a college course in geometry. Part II ("Analytic Techniques") does not, its name notwithstanding, involve analysis, but does cover a variety of useful techniques for tackling geometric problems: computational formulas, complex numbers, and barycentric coordinates. Part III ("Further from Kansas") brings in more advanced ideas, with chapters on inversion with respect to a circle, the extended Euclidean plane (projective geometry), and complete quadrilaterals. Part IV contains a series of appendices, mostly consisting of hints and/or solutions to some of the problems in the earlier parts. A good understanding of high school geometry, and a fondness for solving problems, should be sufficient background for this book. There are topics covered here that are not generally covered in a high school course, but definitions are provided for these. The heart of a book like this is, of course, the problems. As I noted earlier, there are a great many of them, and by and large, they struck me as very difficult and involved. Even the diagrams for some of them can be a bit daunting. They should provide a good challenge for prospective test-takers, though the large number of unsolved problems might prove frustrating for some. Even if not used as the text for a geometry course, an instructor of such a course might want to keep the book handy as a potential source of challenging problems. And, as previously noted, students preparing for mathematics competitions, and their faculty coaches, should find this book very valuable. --Mark Hunacek, MAA Reviews

This challenging problem-solving book on Euclidean geometry is suitable for students preparing for national or international mathematical Olympiads. In addition to offering a guided tour through the classical results of Euler, Pascal, and others, it provides several carefully chosen worked examples and over 300 practice problems from contests around the world.

Yay v_Enhance!

A well-written and rigorous geometry book for olympiad contestants and math enthusiasts. No matter what your geometry skill level is, you will find this book and its problems very interesting. Highly recommended, and a must for all olympiad contestants.

very good!!!!

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