

Preface

Curves of second degree, or conics, are traditionally viewed as objects pertaining to analytic geometry and are studied in lower-level courses in engineering colleges. At best, only the optical properties of conics are mentioned among their geometric properties. But those curves also possess a number of other nice properties, a majority of which can be established by methods of elementary geometry well within the reach of high school students. Moreover, conics help solve some geometric problems seemingly unrelated to conics. In this book the reader will find the most interesting facts about curves of order two, including those proved recently.

Chapter 1 deals with the elementary properties of conics. Most of the facts mentioned there are well known. The remaining material is also rather simple, so that the entire chapter does not impose any prerequisites on the reader beyond the standard high school curriculum. Some simple but important results are offered as exercises. We recommend that the reader try to solve them before reaching for the solutions. This should facilitate the understanding of the material later on. Chapter 2 is of an auxiliary nature. It contains some facts from classical geometry needed for understanding the remaining chapters, which are not usually studied in high school. In Chapter 3 we mention projective properties common to all conics. Some of them, such as the theorem on pencils of conics, are quite complicated. Finally, Chapter 4 is devoted to metric properties. As a rule, they concern only special kinds of conics. This is the most complicated chapter of the book, which requires a good understanding of the material in the previous chapters.

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