

Preface

Geometric inequalities are one of the most interesting sections of elementary mathematics and have a wide range of applications in geometry and the other fields of mathematics, such as algebra and trigonometry. To prove geometric inequalities one often has to use, besides the geometric reasoning, algebraic transformations, trigonometric relations and inequalities, calculus and mathematical analysis.

This book is the third book of the authors about inequalities. The first two books were dedicated to algebraic inequalities and were published in 2015 in South Korea. All these books reflect long years of experience of the authors in teaching. Most of the problems were created or proved by the authors during those classes.

The authors have tried not to use, whenever possible, the concept of a derivative, therefore making the solutions of many problems understandable to students. The book contains more than 1000 problems. Approximately 800 problems in the book are with thorough solutions. Basically, these are non-standard problems.

The majority of problems are for mathematics competitions and Olympiads. Many problems in the book and the majority of the solutions belong to the authors. Some of those problems were used by the authors to teach their students interested in mathematical Olympiads. In few cases, the solution was proposed by a student, so his/her name is indicated. Some problems of the authors, included in this book, were proposed in mathematical Olympiads (in different countries). Some problems were proposed in different mathematical journals, such as the *American Mathematical Monthly* (MAA), *Crux Mathematicorum with Mathematical Mayhem* (Canadian Mathematical Society), *Mathematical Reflections* (USA), and *Kvant* (Russia).

The book is divided into eight chapters, each of the chapters consists of one, two, three, four or five paragraphs. The basis of the classification is usually the method of the solution.

The authors have tried to find common approaches to different problems. The goal of the book is to teach the reader new and classical methods for proving geometric inequalities.

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Methods of Proving

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