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Techniques of Problem Solving

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The problem solving in its general sense is inseparable from perhaps all scientific and creative activities. The analytical approach to the existing problems to be solved and good handling the techniques of their treatment are the principal ways to satisfactory solutions.

The referred book offers a representative overview of basic mathematical and analytical ideas of effective problem solving. They include counting, logic (induction and contradiction in proving), graphical and visual techniques, recursion methods, generating functions, some probabilistic and statistical ideas, etc.

The text of the book is divided into eight main chapters. The first one introduces the *Basic Concepts* like method of counting, logical concepts, parity, and several illustrative examples. The second chapter, *Deeper Look at Geometry*, is characterized by its title, as well as the third one, *Problems Involving Counting*. The following chapter, *Problems of Logic*, deals with concepts like straight logic but also games, parity, tracing routes and it also includes arithmetic problems. The fifth chapter is titled *Recreational Math* and, in accordance with this title, it is focused to the topics like magic squares and weightings. The following chapter is oriented to more advanced mathematics, namely *Algebra and Analysis*. The last but one chapter, *Miscellany*, deals with two topics – with variations of the "crossing the river" problem, and with analysis of hidden mistakes in impossible statements. Finally, the last chapter is titled *Real Life* and it deals with practical (and "less practical") problems connected with real objects. They are based on the ingenious application of geometry or statistics or of other smart approaches to the analysis of the problems.

The book is completed by *Bibliography* (37 items) and *Index*.

Each chapter is concluded by several numbered *Exercises*. Their solutions (prepared by Luis Fernández and Haedeh Gooransarab) is the conclusive part of the referred volume.

The book was evidently written for students but it can serve as a training material for anybody who is to be familiar with various problem solving techniques and with their "philosophy". Even if most (but not all) of the problems presented in the volume are of mathematical structure, the "radiation" of the presented methods reaches much wider class of practical, theoretical or "recreational" problems. In this sense the referred book can be recommended to everyone who looks for a vivid and widely treated presentation of approaches to problems to be solved.

Milan Mareš