

Challenging Mathematical Problems with Elementary Solutions,  
by A.M. Yaglom and I.M. Yaglom. Holden-Day Inc., 1964. viii + 231  
pages.

As claimed in the preface, this book is the first of a two volume translation and adaptation from the Russian of the following book: 'Neelementarnye Zadachi v elementarnom izlozhenii', Moscow, 1954. The authors, Akiva and Isaak Yaglom, are twin brothers and are well-known mathematicians known for their lucid and clear exposition.

The present book deals with combinatorial analysis and probability theory and the second part deals with problems from various branches of mathematics. There are one hundred problems which are graded according to increasing difficulty by one, two or three asterisks. The problems are classified into sections: 1. Introductory problems 2. The representation of integers as sums and products 3. Combinatorial problems on the chessboard 4. Geometric problems on combinatorial analysis. 5. Problems on the binomial coefficients 6. Problems on computing probabilities 7. Experiments with infinitely many possible outcomes 8. Experiments with a continuum of possible outcomes.

Each of these sections begins with a clear exposition of the fundamentals required for an understanding of the problems. The listing of the problems takes 36 pages. The solutions take about 180 pages which are followed by a short section on answers and hints, in about 10 pages. Suggestions are given in the beginning about the proper ways to use the book which are pedagogically sound. Some of the problems have also appeared in the Moscow Mathematical Olympiads.

Thus problem 9 reads: A group of 11 scientists are working on a secret project, the materials of which are kept in a safe. They want to be able to open the safe only when a majority of the group is present. Therefore the safe is provided with a number of different locks, and each scientist is given the keys to certain of these locks. How many locks are required, and how many keys must each scientist have?

Sometimes more than one solution to the problems are given; the solutions to the problems show the perfect craftsmanship of the authors.

The misprints and errors, if any, are difficult to find. The book deserves to be in the hands of young mathematical enthusiasts in high school or early years of college. Even later one can always pick up the book and find many problems to challenge him. The book is stimulating and keeps up throughout the creative spirit of the student. The translator and the editors deserve to be congratulated for making this excellent book available to the English speaking people.

For a more detailed review see Math. Reviews, Vol. 29 (3), 1965. ph.21.

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