

**ZMATH 2016b.00096****Arnold, V. I.****Lectures and problems: a gift to young mathematicians. Translated by Dmitry Fuchs and Mark Saul.**

MSRI Mathematical Circles Library 17. Providence, RI: American Mathematical Society (AMS); Berkeley, CA: Mathematical Sciences Research Institut (MSRI) (ISBN 978-1-4704-2259-2/pbk). viii, 176 p. (2015).

Vladimir Igorevich Arnold (1937–2010) was one of the greatest mathematicians of the 20th century, who had enormous contributions to several fields of mathematics. He is very well known for the Kolmogorov-Arnold-Moser theorem regarding the stability of integrable systems, but also for numerous deep contributions to the theory of dynamical systems, catastrophe theory, singularity theory, topology, symplectic geometry, differential equations, classical mechanics, and hydrodynamics. Arnold was also a popularizer of mathematics. Through his numerous lectures, seminars, and as the author of several popular mathematics books, V.I. Arnold influenced the development of contemporary mathematics. The book under review is mainly addressed to younger students interested in mathematics. This volume is a unique attempt to collect some problems of major interest under one cover and supply them with comments. The content is divided into four distinct parts. *Continued fractions* takes a common enrichment topic in high school mathematics and pulls it in directions that only a master of mathematics could envision. We point out the numerous examples and comments, which largely illustrate the basic role of continuous fractions in several fields. In *Geometry of complex numbers, quaternions, and spins* the context is physics. However, the author extracts the mathematical aspects of the discussion in a way that students can understand long before they master the field of quantum mechanics. The following chapter is devoted to *Euler groups and arithmetic of geometric progressions*. Here we remark some exciting subjects like Fermat-Euler dynamical systems, statistics of geometric progressions, measurement of the degree of randomness of a subset, or patterns in coordinates of quadratic residues. Part 4 of this volume contains *Problems for children 5 to 15 years old*. This is really a beautiful collection of the author's favorite intellectual morsels. Many of these problems are not original, but all are worth thinking about. This book provides a macroscopic view of some fundamental chapters of mathematics. It is a marvelous book that should belong to the personal library of every mathematician.

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