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Arnold, V. I.

Mathematical understanding of nature. Essays on amazing physical phenomena and their understanding by mathematicians. Translated from the Russian by Alexei Sossinsky and Olga Sipacheva.

Providence, RI: American Mathematical Society (AMS) (ISBN 978-1-4704-1701-7/pbk). xiv, 167 p. (2014).

This is an English translation of the book published in Russian in 2011. As the late Professor Arnold wrote in the preface to the Russian edition, “the 39 essays collected below have the same goal: to teach the reader not only to multiply large numbers (which sometimes also has to be done), but to guess about unexpected connections between seemingly unrelated phenomena and facts, at times coming from different branches of the natural and other sciences. Examples teach no less than rules, and errors, more than correct but abstruse proofs. Looking at the pictures in this book, the reader will understand more than learning by rote dozens of axioms (even together with their consequences about what sea the Volga river falls into and what horses eat).” Most essays in the book are quite short, and their level of difficulty varies significantly – some require only knowledge of a high school mathematics and some may be viewed as a serious challenge even for an experienced mathematician. As most texts written by Arnold, the book under review is a quite demanding but very stimulating and inspiring reading featuring original author’s illustrations.

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Classification: E25 M55

Keywords: applied mathematics; mathematical physics; problem solving