Some nonstandart proofs and problems in the analysis

© A.V. Neklyudov

Bauman Moscow State Technical University, Moscow, 105005, Russia

We consider some questions and the problems supplementing a basic course of the mathematical analysis at technical: calculation of Poisson integral by methods of integral calculus of functions of one variable, different approaches to calculation of volume of a ball in multidimensional space, various rare proofs of divergence of a harmonic series, calculation of the sums of Dirichlet series by means of infinite product. In popular textbooks these questions aren't considered as a rule. This material can be useful to teachers and well advanced students, facultative work, and preparation for the Olympic Games on mathematics etc.

***Keywords*:** *Poisson integral, volume of n-dimensional ball, harmonic series, Dirichlet series*.

Neklyudov A.V. (b. 1962) graduated from the Mechanics and Mathematics Faculty of Lomonosov Moscow State University in 1984. Ph.D., Assoc. Professor of the Higher Mathematics Department of Bauman Moscow State Technical University. Author of scientific articles on the partial differential equations, including nonlinear, in unlimited areas and to absence of solutions of the nonlinear equations in unlimited areas; textbooks for students. e-mail: nekl5@yandex.ru