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Book reviews. Dettman, J. W.: Matematické metody ve fyzice a technice (Mathematical Methods in Physics and Engineering)

BOOK REVIEWS

Dettman, J. W.: MATEMATICKÉ METODY VE FYZICE A TECHNICE (Mathematical Methods in Physics and Engineering), Praha, Academia 1969. 356 pp., 16 fig., Kčs 32,—.

In Czech translation at last appears the book, whose aim is to fulfil the following task: to provide such knowledge of mathematics for the students of physics and technical sciences to be able to understand without difficulties the modern physics and technics. As it is well known, the courses of mathematics neither for physicists nor at technical universities can accomplish this at their present state.

The reviewed book assumes that the reader is familiar with fundaments of advanced calculus and with the theory of differential equations. Further a knowledge of the vector analysis is required as well as a partical knowledge of the theory of functions of complex variable which is however, not necessary. Fundaments of higher algebra are explained at the beginning.

The book is divided into six chapters. Chapter 1 deals with determinante, linear equations, matrix theory, eigenvalues and vectors, with the theory of vector spaces of finite as well as infinite dimensions, with the theory of Hilbert space and finally with the fundaments of Fourier analysis. Chapter 2 presents the calcululus of variations and its application, the problem of the eigenvalue is formulated. Boundary value problems are studied in the next two chapters. The method of the separation of the variables is introduced, Sturm-Liouville problem, the development of functions into a series with respect to orthogonal functions and some special functions are investigated. Further the solution of boundary value problems by the method of Green function is introduced and the equivalence of the solution of the boundary value problem with the solution of an integral equation is proved. Integral equations are dealt with in Chapter 5; here Hilbert-Schmidt and Fredholm theories of integral equations are presented. Finally in the last chapter the reader gets acquainted with the method of integral transforms, particularly with Fourier and Laplace transforms.

Chapters are divided into section for the sake of clarity, each of sections is followed by a number of exercises which serve for practising and completing the material. Chapters are supplied with lists of literature which is essentially complemented in Czech edition.

The author has made his best to help the reader to comprehend various relations and therefore he has not used the method Theorem — Proof. However, the corectness of the exposition is not affected.

In the conclusion it can be said that the book succesfully fills the gap which could be felt in the literature of this direction.

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