

Vector analysis and Cartesian tensors, by K. Karamcheti. Holden-Day, Inc., San Francisco, 1967. Burns and MacEachern Ltd., 52 Rainside Road, Don Mills, Ontario. xii + 255 pages. Can. \$10.75.

In the author's words: "The aim of the book is twofold

- (1) to clearly and systematically explain the basic contents of vector analysis, Cartesian tensor notation and Cartesian tensor analysis and
- (2) to illustrate by selected applications in different fields of engineering and mathematical physics, their use in the formulation of physical problems and in the derivation of some general results relating to those problems".

The second of these aims is, I think, achieved, the applications chosen being informative and of physical interest. The book however falls short of the first objective.

The definitions of both vector and Cartesian tensor are somewhat circular, on page four we find: "Thus we say that vectors are added according to the parallelogram law of addition" and on page five: "We now define a vector as a quantity that possesses both a magnitude and a direction and obeys the parallelogram law of addition".

The development of vector and tensor analysis is not good. Among the lapses I would mention the following: Some of the laws of vector algebra, for example the distributive laws, are not mentioned. There is no treatment of the ideas of linear independence. No proof is given that the operations of multiplication of two tensors and of contraction lead to a tensor. The integral theorems of Green, Gauss and Stokes receive formal treatment and no restrictions are stated on either the functions or domains involved. The invariance of vector and tensor equations is not demonstrated or in fact even mentioned.

It may be that the intended audience for the book, the student of engineering of the physical sciences, might find it satisfactory, but for a student of applied mathematics, it leaves much to be desired.

The book has a reasonable number of exercises which include some quite important results. These are collected at the end of the book rather than at the end of each chapter.

D.R. Westbrook, University of Calgary

Vector and tensor analysis with applications, by A.I. Borisenko and I.E. Tarapov. Translated by R.A. Silverman. Prentice-Hall, Inc., Englewood Cliffs, 1968. x + 257 pages. U.S. \$10.50.

Although this book is not likely to become a classic in the field, it is a readable and fairly careful presentation of the main ideas of vector and tensor analysis.

The first chapter deals with the ideas of vector algebra and includes the basic laws, a treatment of linear dependence, bases and reciprocal bases, and the contravariant and covariant components of a vector.