$$F(t) = \int_0^{\infty} x^2 e^{-tx} dx$$

which can be shown to be a constant multiple of t^{-3} by essentially the same substitution! Reviewer and advanced readers do not need to be convinced of the value of Lebesgue's theory, but a college junior does. The by-passing of the above difficulties does not justify the very real effort he will have to make to master it.

However, this minor criticism must not carry much weight in evaluating an otherwise truly admirable book.

A.M. Macbeath, Birmingham

Ordinary Differential and Difference Equations: Theory and Applications, by F. Chorlton. Van Nostrand, Toronto, Princeton, 1965. xii + 284 pages.

This book covers the basic material in a first course in Ordinary Differential Equations, including first-order equations, special second-order equations, linear constant coefficient with emphasis on the D-operator, non-homogeneous linear equations, solution in series, and the equations of Bessel and Legendre. Because of the numerous worked examples from a variety of areas in the Physical Sciences and the large number of excellent problems it makes a fine text for Engineering and Science undergraduates.

In addition to this standard material, there are three chapters on Finite Difference equations, with the applications, and a final chapter on the Laplace transform. Unfortunately, there is no existence theorem in the book.

P.J. Ponzo, Waterloo

Introduction to Ordinary Differential Equations, by Shepley L. Ross. Blaisdell Publishing Co., 1966. viii + 337 pages. $7.50.

Designed for a one-semester introductory course in differential equations, this book covers the traditional elementary material. The nine chapters cover first-order equations, linear equations with constant and variable coefficients, series solutions, and linear systems. There are numerous worked examples and applications to problems in electricity and mechanics. In addition, the basic theorems are given. The last chapter is on the Laplace transform.

An interesting and worthwhile addition is the chapter on approximate methods of solution, including the method of isodines, Taylor series expansions and numerical integration. Unfortunately, the introduction of

https://doi.org/10.1017/S0008439500028605 Published online by Cambridge University Press

the D-operator is left until very late in the book, in connection with linear systems, necessitating an elaborate explanation of the method of undetermined coefficients.

P.J. Ponzo, Waterloo

Stability of Motion, by A.M. Liapunov. Translated by F. Abramovici and M. Shimshoni. New York, Academic Press, 1966. xi + 203 pages.

In his 1892 Mémoire, Liapunov considered the stability of the equation

$$\dot{\underline{x}}(t) = A\underline{x} + X(\underline{x})$$

where X, near $\underline{x} = 0$, vanishes to at least the second order. He there covered the cases where all eigenvalues of A are negative in real part, or where one vanished, or where two were pure imaginary.

Liapunov also studied the case where two eigenvalues vanished, the rest having negative real parts, in three papers not so well known as his Mémoire. This publication consists of a new translation of these, together with contributions by V.P. Basov and V.A. Pliss. They are out of order; a better discussion of sources could be given.

One should begin with the 1893 work, here beginning on p.128, in which Liapunov considers only the case n = 2. Thus in effect one has simply $\dot{x} = y + 0(|x|^2)$, $\dot{y} = 0(|x|^2)$. The work in which this is extended to general n remained incomplete, and unpublished; it was found by Smirnov in 1954 and published in Liapunov's Collected Works. Here it is published beginning on p.13. The final argument concerning the case when all the higher terms in $X(\underline{x})$ must be considered before stability can be decided, was fitted in by Pliss in 1964, in a short paper here starting on p.185. The short note beginning on p.123 is again out of place, and shows that only in the case that all eigenvalues of A have negative real parts is it possible to determine stability by examining A alone [without also studying $X(\underline{x})$].

D.R. Miller, Western Ontario

Introduction to Ordinary Differential Equations, by Albert L. Rabenstein. Academic Press, New York, London, 1966. xii + 431 pages. $9.95 (hard bound in gray buckram).

The title of this book is a little misleading. While primarily devoted to differential equations there is also a smattering of material that one usually associates with other courses. The whole treatment is aimed at undergraduate engineering and science students whose background need not include advanced calculus. The miscellaneous extra topics treated probably result mainly from this choice of target audience.