

Integral equations. By F. G. Tricomi. New York, Interscience, 1957. 8+238 pp. \$7.00.

This excellent textbook on integral equations was written to give an adequate introduction of the subject to those who require a knowledge of it in mathematics or in its applications. With a basic knowledge of the theory of the Lebesgue integral and the theory of functions of a complex variable, this book may be read with profit.

The first three chapters are devoted to the so-called regular theory. Here we are given a careful and leisurely discussion of the Volterra equation, the regular Fredholm equation and equations with symmetric kernels. Such a program may sound traditional but an examination of the text proves otherwise. For one thing, the text is liberally peppered with physical problems which lead to such integral equations. Another feature reveals to us the relation between linear differential and integral equations. When further background material in analysis is required, Professor Tricomi supplies the reader with a discussion of the important features and provides references. Many of the historical remarks are of great interest. In short, we have an interesting and sparkling account of the regular theory of linear integral equations which should hold the attention of a serious worker.

The last chapter deals with singular and non-linear integral equations. Integral equations of the convolution type (Abel, Picard and Wiener-Hopf) are merely mentioned since they rightly belong to the realm of Fourier transform theory, a chapter of the subject which the author does not choose to discuss in detail. The main class of singular, linear, integral equations which is treated is of the Cauchy type, and with it, the Hilbert transformation. Carleman's function theoretic method for handling equations of this type is discussed and it is pointed out (at last!) that this work preceded that of Vekua, Mikhlin, etc. We should be thankful to Professor Tricomi for having corrected the misconception which has crept into the literature. The chapter closes with some remarks about non-linear integral equations. A notable feature of this chapter is the care with which one is introduced to the study of singular equations.

There are two appendices, which are intended to round out the text—one on systems of linear equations, the other on Hadamard's theorem on determinants. Some exercises, as well as a small bibliography are provided.

The text may be heartily recommended to pure and applied mathematicians.

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