

13 [7.50].—THEODORE J. RIVLIN, *The Chebyshev Polynomials*, John Wiley & Sons, Inc., New York, 1974, vi + 186 pp., 24 cm. Price \$15.95.

This short monograph is an elegant presentation of most of what is known and interesting about the Chebyshev polynomials  $T_n(x)$ . The presentation appears leisurely in spite of the amount of material presented due to the careful organization of the material. The book contains four chapters as follows: Chapter 1 has basic definitions, then treats interpolation at the zeros and extrema of  $T_n(x)$  and finishes with orthogonality properties. Chapter 2 gives the minimax approximation and extremal properties of  $T_n(x)$ . This chapter is divided into two distinct parts and each viewpoint is developed naturally from first principles. The result is compact introductions to Chebyshev approximation theory and the maximization of linear functionals. The theme of Chapter 3 is the use of expansions of functions in a series of  $T_n(x)$ . This material introduces many ideas and methods of numerical analysis and approximate computations. The final short Chapter 4 shows that  $T_n(T_m(x)) = T_{nm}(x)$  (i.e. the Chebyshev polynomials are closed under composition) and develops the consequences of this.

The book is written so as to be useful as a text and there are over two hundred exercises. These vary from easy to difficult and also serve to present many facts without lengthening the text. The primary use of this book is as a reference for the working applied mathematician and numerical analyst. It gathers together, as no other book does, the variety of material that one needs from time to time in the analysis of approximate methods or the search for counterexamples. A brief survey of the related literature (or, at least, a more complete bibliography) and a more detailed index would have enhanced its value in this respect.

The book is recommended as a welcome and unique addition to an applied mathematics library.

J. R.

14 [8.00].—J. LAURIE SNELL, *Introduction to Probability Theory with Computing*, Prentice-Hall, Inc., Englewood Cliffs, N. J., 1975, x + 294 pp. Price \$8.95 paperbound.

This is an introductory course in probability theory, with major emphasis on computer simulations and applications. The level is quite elementary; for instance, only finite probability spaces are considered. As each new concept is introduced, the student is presented with a simple computer program and sample run illustrating the concept. Thus, after only a few pages of preliminaries, the five-line program "RANDOM" is introduced, showing how to generate twenty random numbers. Such computer generated random numbers are the tool for illustrating stochastic phenomena throughout the remainder of the book. By the next page the student learns how to generate a sequence of outcomes of coin tossing, and before the course's end one can simulate the arc sine distribution of fluctuation theory and the ergodicity of a regular finite Markov chain. All programs are written in the language BASIC, with actual run printouts immediately following the program listings. Needless to say, the text will only be effective in conjunction with access to a computer facility equipped with BASIC. Also, a certain familiarity with the language (which may be acquired in a few hours) is a prerequisite. To a certain extent, though, the student is able to learn program writing skills concurrently with the theoretical material.

Chapter 1 contains the basic framework and terminology of probability, some elementary combinatorics, then conditional probability. Among the computer applications are numerical solutions to the famous "birthday" and "hat check" problems. In