42 [2.00, 3].—ALSTON S. HOUSEHOLDER. *Principles of Numerical Analysis*, Dover, New York, 1974, x + 274 pp., 21 cm. Price $4.00 (paperbound).

This a most welcome and slightly corrected reissue of the 1953 edition, originally published by McGraw-Hill. The thorough mathematical developments and the scholarly bibliographic discussions continue to make this work an indispensable classic.

The eight chapter headings are: 1. The art of computation, 2. Matrices and linear equations, 3. Nonlinear equations and systems, 4. The proper values and vectors of a matrix, 5. Interpolation, 6. More general methods of approximation, 7. Numerical integration and differentiation, 8. The Monte Carlo method.

E. I.

43 [9.00].—ALLAN M. KIRCH, *Elementary Number Theory: A Computer Approach*, Intext Educational Publishers, New York, 1974, xi + 339 pp., 25 cm. Price $11.75.

Elementary Number Theory: A Computer Approach, by Allan M. Kirch is an attempt to build a text around some reasonable mix of the two subjects. The avowed objective is to present certain aspects of elementary number theory together with related computer applications. This is carried out in terms of twenty-eight chapters, which are called "problems"; plus three appendices, the last of which is a "quick course in Basic Fortran IV".

The idea of attempting a work of this kind is certainly a valid one. Moreover, the nature of its objectives requires a rather detailed frame of reference which includes:

(i) for what group of students is the text intended,

(ii) what is meant by "elementary number theory",

(iii) what is meant by a "computer approach",

(iv) at what level and with what implied pedagogical technique is the material presented.

Having brought this book into existence, the author evidences a clear point of view concerning each of the above.

With regard to (i) the author presents the book as "a text for a beginning number theory course for students with good backgrounds in high school algebra" or as "a computer supplement to a more advanced treatment". The equivocation inherent in this becomes clear as one reads the book. The first eighteen problems touch on the basic properties of divisibility, greatest common divisor and least common multiple, the definition of prime numbers, unique factorization, number bases, and linear congruences. In this portion of the book the relevant theorems are either proved or included among the exercises (solutions at the end of the book). Here two criticisms might be made. First, the material is so thinly spread out that the subject hardly seems like a "theory". Secondly, the proofs tend to be very terse and awkward. In many instances the source of a critical theorem lies far away in the text. For example, the Unique Factorization Theorem is stated and proved in Problem 14, whereas it depends on material of Problems 4 and 5. In fact, the main step in the proof of the Unique Factorization Theorem is given as an exercise, which appears *after* the theorem. From Problem 19 to the end of the book proofs per se tend to be of less importance; and the reader is often referred to other texts. The existence of primitive roots modulo a prime power, and the quadratic reciprocity law, are typical casualties of this policy.

There is little doubt as to the author's conception of "computer approach". It involves a series of examples of gradually increasing complexity which illustrates various aspects of Fortran IV programming. This is carried out carefully, extensively, and enthusiastically. There is a clear impression that this is the main focus of the book; and that the number theory is a convenient excuse. Questions of optimal program design are