

## Preface

Finite mathematics has in recent years become an integral part of the mathematical background necessary for such diverse fields as biology, chemistry, economics, psychology, sociology, education, political science, business and engineering. This book, in presenting the more essential material, is designed for use as a supplement to all current standard texts or as a textbook for a formal course in finite mathematics.

The material has been divided into twenty-five chapters, since the logical arrangement is thereby not disturbed while the usefulness as a text and reference book on any of several levels is greatly increased. The basic areas covered are: logic; set theory; vectors and matrices; counting – permutations, combinations and partitions; probability and Markov chains; linear programming and game theory. The area on vectors and matrices includes a chapter on systems of linear equations; it is in this context that the important concept of linear dependence and independence is introduced. The area on linear programming and game theory includes a chapter on inequalities and one on points, lines and hyperplanes; this is done to make this section self-contained. Furthermore, the simplex method is given for solving linear programming problems with more than two unknowns and for solving relatively large games. In using the book it is possible to change the order of many later chapters or even to omit certain chapters without difficulty and without loss of continuity.

Each chapter begins with a clear statement of pertinent definitions, principles and theorems together with illustrative and other descriptive material. This is followed by graded sets of solved and supplementary problems. The solved problems serve to illustrate and amplify the theory, bring into sharp focus those fine points without which the student continually feels himself on unsafe ground, and provide the repetition of basic principles so vital to effective learning. Proofs of theorems and derivations of basic results are included among the solved problems. The supplementary problems serve as a complete review of the material in each chapter.

More material has been included here than can be covered in most first courses. This has been done to make the book more flexible, to provide a more useful book of reference and to stimulate further interest in the topics.

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