

# CONTENTS

|  | PAGE |
|--|------|
| <b>PREFACE</b>   | v    |
| <b>INTRODUCTION</b>  | ix   |
| <b>ABSTRACT FOUNDATIONS</b>  | 1    |
| 1 Semantics of assignment: R. M. BURSTALL  | 3    |
| 2 Some transformations and standard forms of graphs, with applications<br>to computer programs: D. C. COOPER | 21   |
| 3 Data representation—the key to conceptualisation: D. B. VIGOR  | 33   |
| <b>MECHANISED MATHEMATICS</b>  | 45   |
| 4 An approach to analytic integration using ordered algebraic expressions:<br>L. I. HODGSON                  | 47   |
| 5 Some theorem-proving strategies based on the resolution principle:<br>J. L. DARLINGTON                     | 57   |
| <b>MACHINE LEARNING AND HEURISTIC PROGRAMMING</b>  | 73   |
| 6 Automatic description and recognition of board patterns in Go-Moku:<br>A. M. MURRAY and E. W. ELCOCK       | 75   |
| 7 A five-year plan for automatic chess: I. J. GOOD   | 89   |
| 8 New developments of the Graph Traverser: J. DORAN  | 119  |
| 9 BOXES: an experiment in adaptive control: D. MICHIE and R. A. CHAMBERS                                     | 137  |
| 10 A regression analysis program incorporating heuristic term selection: J. S.<br>COLLINS                    | 153  |
| <b>COGNITIVE PROCESSES: METHODS AND MODELS</b>   | 171  |
| 11 A limited dictionary for syntactic analysis: P. BRATLEY and D. J. DAKIN                                   | 173  |
| <b>PROBLEM-ORIENTED LANGUAGES</b>  | 183  |
| 12 POP-1: an on-line language: R. J. POPPLESTONE   | 185  |
| 13 Self-improvement in query languages: J. M. FOSTER   | 195  |
| 14 POP-2 reference manual: R. M. BURSTALL and R. J. POPPLESTONE  | 205  |
| <b>INDEX</b>   | 251  |