Contents

Foreword 5

Preface 7

1 Fundamentals 9
- 1.1 Set theory 10
- 1.2 Logic 11
- 1.3 Number sets 12
- 1.4 Algebra 16
- 1.5 Number theory 22

2 Geometry and trigonometry 29
- 2.1 Geometric theorems 30
- 2.2 Geometry in the plane 32
- 2.3 Geometry in space 38
- 2.4 Vectors 45
- 2.5 Plane analytic geometry 48
- 2.6 Spatial geometry 51
- 2.7 Curves 53

3 Functions 63
- 3.1 Trigonometric functions 64
- 3.2 Exponential functions 72
- 3.3 Logarithmic functions 74
- 3.4 Limits 78
- 3.5 Derivatives 79
- 3.6 Primitive functions 84
- 3.7 Integrals 85
- 3.8 Polynomial approximation 89
- 3.9 Differential equations 93

4 Programming and numerical analysis 95
4.1 Symbols for flow charts 96
4.2 BASIC 97
4.3 Algorithms 102
4.4 Numerical solution of equations 108
4.5 Numerical integration 110
4.6 Numerical solution of differential equations 113

5 Probability and statistics 117
5.1 Elementary probability theory 118
5.2 Probability distributions 122
5.3 Algorithms for calculation of probability distributions 135
5.4 Algorithms for simulation of probability distributions 139
5.5 Descriptive statistics 151
5.6 Confidence intervals 155
5.7 Statistical data analysis with calculator and computer 157

6 Miscellaneous 161

7 History 169

8 Glossary 179

9 Index 195