CONTENTS

Part 1 Algebra and functions 1

Indices 1
Surds 7
Polynomial expressions 10
Quadratic functions 13
Simultaneous equations 21
Inequalities 24
Sketching graphs 27
Graphical solution of equations 31
Transformation of curves 34
Review exercise 1 40
Examination exercise 1 45

Part 2 Coordinate geometry

Gradient, mid-point, length of a line 52
Parallel and perpendicular lines 53
The equation of a straight line 55
The intersection of two lines 59
Review exercise 2 61
Examination exercise 2 63

Part 3 Sequences and series 1

Sequences, the *n*th term 67
The sigma notation 71
Arithmetic series 72
Review exercise 3 80
Examination exercise 3 81

Part 4 Differentiation 1

Gradient of a curve 84
The general rule 86
Tangents and normals 93
Review exercise 4 99
Examination exercise 4 102

Part 5 Integration 1

Indefinite integration 105
Finding the equation of a curve 109
Review exercise 5 111
Examination exercise 5 113

Part 6 Algebra and functions 2

Algebraic division 115
Factor theorem 116
Remainder theorem 122
Review exercise 6 126
Examination exercise 6 127

Part 7 The circle

Equation of a circle 130
Tangents and normals 134
Review exercise 7 137
Examination exercise 7 139

Part 8 Sequences and series 2

Geometric series 141
Sum to infinity of a geometric series 145
Binomial expansion 150
Approximations and further expansions 156
Review exercise 8 158
Examination exercise 8 160

Part 9 Trigonometry

Sine and cosine rules 165
The area of a triangle 172
Trigonometric graphs 174
Solving trigonometric equations 177
Radians 186
Solving equations using radians 192
Sketching the graphs of trigonometric functions 195
Review exercise 9 199
Examination exercise 9 203

Part 10 Logarithms

Logarithm as an index 208
Laws of logarithms 208
Review exercise 10 213
Examination exercise 10 215