Contents

NOWREK	
Integers, decimals and symbols	
Addition, subtraction, multiplication and division	
Using fractions	
Different types of number	
Listing strategies	
The order of operations in calculations	
Indices	
Surds	
Standard form	
Converting between fractions and decimals	
Converting between fractions and percentages	
Fractions and percentages as operators	
Standard measurement units	
Rounding numbers	
Estimation	
Upper and lower bounds	
Review it!	

Topic 2

Topic 1

ALGEBRA

Simple algebraic techniques	44
Removing brackets	46
Factorising	49
Changing the subject of a formula	52
Solving linear equations	54
Solving quadratic equations using factorisation	56
Solving quadratic equations using the formula	58
Solving simultaneous equations	60
Solving inequalities	63
Problem solving using algebra	67
Use of functions	68
Iterative methods	72
Equation of a straight line	75
Quadratic graphs	79
Recognising and sketching graphs of functions	83
Translations and reflections of functions	87
Equation of a circle and tangent to a circle	90
Real-life graphs	92
Generating sequences	95
The <i>n</i> th term	97
Arguments and proofs	99
Review it!	101

Topic 3

RATIO, PROPORTION AND RATES OF CHANGE

Introduction to ratios	102
Scale diagrams and maps	105
Percentage problems	106

Direct and inverse proportion	109
Graphs of direct and inverse proportion and rates of change	112
Growth and decay	116
Ratios of lengths, areas and volumes	118
Gradient of a curve and rate of change	121
Converting units of areas and volumes, and compound units	124
Review it!	127

Topic 4

GEOMETRY AND MEASURES

2D shapes	128
Constructions and loci	130
Properties of angles	133
Congruent triangles	136
Transformations	138
Invariance and combined transformations	141
3D shapes	143
Parts of a circle	145
Circle theorems	146
Projections	149
Bearings	150
Pythagoras' theorem	151
Area of 2D shapes	153
Volume and surface area of 3D shapes	154
Trigonometric ratios	158
Exact values of sin, cos and tan	161
Sectors of circles	162
Sine and cosine rules	164
Vectors	166
Review it!	169

Topic 5

PROBABILITY

The basics of probability	170
Probability experiments	173
The AND and OR rules	175
Tree diagrams	177
Venn diagrams and probability	182
Review it!	187

Topic 6

STATISTICS

Sampling	188
Two-way tables and pie charts	190
Line graphs for time series data	192
Averages and spread	194
Histograms	197
Cumulative frequency graphs	199
Comparing sets of data	201
Scatter graphs	203
Review it!	205
Answers	206