

Contents

1.	Number 1	1
1.1	Natural numbers	1
1.2	Integers and order of operations	4
1.3	Fractions	8
1.4	Decimals and percentages	14
1.5	Revision of ratio	20
	Test Yourself 1	24
	Assignment	26
2.	Algebra 1	27
2.1	Dealing with algebraic expressions	27
2.2	Removing brackets	30
2.3	Evaluating expressions	32
2.4	Solving linear equations	34
2.5	Writing and solving equations	37
2.6	Algebraic division	40
	Test Yourself 2	42
	Assignment	44
3.	Sets	45
3.1	Revision of sets terminology	45
3.2	Set difference	51
3.3	Using Venn diagrams to solve problems	54
	Test Yourself 3	59
	Assignment	62
4.	Factors	63
4.1	Factorising with common factors	63
4.2	Factorising by grouping terms	66
4.3	Differences of two squares	67
4.4	Factorising quadratic expressions	69
4.5	Quadratic expressions: Third term negative	71
	Test Yourself 4	73
	Assignment	74
5.	Applied Arithmetic	75
5.1	Household bills	75
5.2	Applying percentages	81
5.3	Interest	86
5.4	Compound interest	87
5.5	Income tax	90
5.6	Currency transactions	93
	Test Yourself 5	95
	Assignment	98

6.	Perimeter, Area, Volume	99
6.1	Review of perimeter and area	99
6.2	Area of parallelogram	104
6.3	Rectangular solids	107
6.4	Scale drawing	114
	Test Yourself 6	119
	Assignment	122
7.	Statistics 1	123
7.1	Statistical questions	123
7.2	Sampling	131
	Test Yourself 7	135
	Assignment	137
8.	Probability	138
8.1	Listing outcomes	138
8.2	Chance and the probability scale	142
8.3	Probability and equally likely outcomes	146
8.4	Two events: Use of sample spaces, tree diagrams, two-way tables	151
8.5	Estimating probability from experiments	155
	Test Yourself 8	161
	Assignment	164
9.	Statistics 2	165
9.1	Summary statistics	165
9.2	The mean	169
9.3	The range: variability	173
9.4	Which average to use	176
9.5	Frequency tables	179
	Test Yourself 9	184
	Assignment	187
10.	Geometry 1: Triangles and Quadrilaterals	188
10.1	Revision of lines and angles	188
10.2	Angles of a triangle	192
10.3	Quadrilaterals	196
10.4	The theorem of Pythagoras	202
	Test Yourself 10	208
	Assignment	211
11.	Time and Speed	212
11.1	Time and timetables	212
11.2	Speed, distance, time	218
	Test Yourself 11	222
	Assignment	224

12. Simultaneous Equations	225
12.1 Simultaneous equations	225
12.2 Solving simultaneous equations	226
12.3 Problems leading to simultaneous equations	229
Test Yourself 12	233
Assignment	234
13. Quadratic Equations	235
13.1 Solving quadratic equations using factors	235
13.2 Problems leading to quadratic equations	238
Test Yourself 13	242
Assignment	243
14. Coordinate Geometry: The Line	244
14.1 The coordinated plane	244
14.2 Revision of midpoint of a line segment	247
14.3 Distance between two points	250
14.4 Revision of slope of a line segment	253
14.5 The equation of a line	258
14.6 The equation of a line containing (x_1, y_1) with slope m	262
14.7 Graphing lines	265
14.8 Intersection of lines	268
Test Yourself 14	271
Assignment	273
15. Statistics 3	274
15.1 Revision of line plots and bar charts	274
15.2 Pie charts	279
15.3 Stem and leaf plots	286
15.4 Histograms	291
15.5 Misleading graphs	296
Test Yourself 15	300
Assignment	303
16. Number 2: Indices and Standard Form	304
16.1 The laws of indices	304
16.2 Numbers in standard form	309
16.3 Using the calculator	313
16.4 Significant figures: Approximation	315
Test Yourself 16	318
Assignment	320
17. Circles and Cylinders	321
17.1 The circumference of a circle	321
17.2 The area of a circle	326
17.3 Cylinders	330
Test Yourself 17	334
Assignment	336

18.	Geometry 2: Triangles and Circles	337
18.1	Congruent triangles	337
18.2	Similar triangles	344
18.3	Angles and circles	349
	Test Yourself 18	355
	Assignment	357
19.	Patterns and Sequences	358
19.1	Sequences	358
19.2	Repeating patterns	363
19.3	Linear sequences	366
19.4	Finding the n th term T_n , of a linear sequence	370
19.5	Linear sequences formed from shapes	373
19.6	Other sequences	376
19.7	Graphing linear sequences	379
	Test Yourself 19	383
	Assignment	385
20.	Algebra 2: Inequalities, Algebraic Fractions	386
20.1	Plotting numbers on the number line	386
20.2	Solving inequalities	390
20.3	Adding algebraic fractions	393
20.4	Solving equations involving fractions	394
20.5	Solving problems involving fractions	397
20.6	Simplifying algebraic fractions	398
	Test Yourself 20	401
	Assignment	402
21.	Functions	403
21.1	Functions	403
21.2	Mapping diagrams	406
21.3	Notation for functions	411
	Test Yourself 21	413
	Assignment	415
22.	Graphing Functions	416
22.1	Graphing linear functions	416
22.2	Graphs of quadratic functions	421
22.3	Using quadratic graphs	425
	Test Yourself 22	432
	Assignment	434

23. Trigonometry	435
23.1 The theorem of Pythagoras	435
23.2 Sides of a right-angle triangle	439
23.3 Sine, cosine and tangent ratios	440
23.4 Using your calculator to find ratios	443
23.5 Finding sides and angles of a triangle	445
23.6 Using trigonometry to solve problems	450
Test Yourself 23	455
Assignment	457
24. Drawing and Interpreting Real-life Graphs	458
24.1 Distance-time graphs	458
24.2 Directly proportional graphs	463
24.3 Real-life graphs	469
Assignment	474
25. Geometry 3: Transformations, Constructions, Proofs	475
25.1 Transformation geometry	475
25.2 Symmetries	479
25.3 Constructions 1	485
25.4 Constructing triangles and rectangles	491
25.5 Revision of theorems	496
Assignment	500
Answers	501