Contents

1 Number 1

Prior knowledge check

1.1 Number problems and reasoning 1
1.2 Place value and estimating 3
1.3 HCF and LCM 5
1.4 Calculating with powers (indices) 8
1.5 Zero, negative and fractional indices 11
1.6 Powers of 10 and standard form 14
1.7 Surds 17
Check up 20
Strengthen 22
Extend 26
Test ready 28
Unit test 30

2 Algebra 32

Prior knowledge check

2.1 Algebraic indices 32
2.2 Expanding and factorising 35
2.3 Equations 37
2.4 Formulae 39
2.5 Linear sequences 42
2.6 Non-linear sequences 45
2.7 More expanding and factorising 49
Check up 52
Strengthen 54
Extend 58
Test ready 60
Unit test 62

3 Interpreting and representing data 64

Prior knowledge check

3.1 Statistical diagrams 1 64
3.2 Time series 68
3.3 Scatter graphs 71
3.4 Line of best fit 74
3.5 Averages and range 78
3.6 Statistical diagrams 2 82
Check up 85
Strengthen 87
Extend 91
Test ready 94
Unit test 96

4 Fractions, ratio and percentages 98

Prior knowledge check

4.1 Fractions 98
4.2 Ratios 100
4.3 Ratio and proportion 103
4.4 Percentages 105
4.5 Fractions, decimals and percentages 108
Check up 110
Strengthen 111
Extend 115
Test ready 117
Unit test 119

Mixed exercise 1 121

5 Angles and trigonometry 125

Prior knowledge check

5.1 Angle properties of triangles and quadrilaterals 125
5.2 Interior angles of a polygon 129
5.3 Exterior angles of a polygon 133
5.4 Pythagoras' theorem 1 136
5.5 Pythagoras' theorem 2 139
5.6 Trigonometry 1 142
5.7 Trigonometry 2 145
Check up 148
Strengthen 150
Extend 156
Test ready 158
Unit test 160

6 Graphs 162

Prior knowledge check

6.1 Linear graphs 162
6.2 More linear graphs 165
6.3 Graphing rates of change 168
6.4 Real-life graphs 172
6.5 Line segments 176
6.6 Quadratic graphs 178
6.7 Cubic and reciprocal graphs 181
6.8 More graphs 183
Check up 186
Strengthen 189
Extend 194
Test ready 196
Unit test 198

7 Area and volume 200

Prior knowledge check

7.1 Perimeter and area 200
7.2 Units and accuracy 203
7.3 Prisms 207
7.4 Circles 210
7.5 Sectors of circles 214
7.6 Cylinders and spheres 218
7.7 Pyramids and cones 221
Check up 224
Strengthen 226
Extend 230
Test ready 232
Unit test 234

Mixed exercise 2 236

8 Transformations and constructions 240

Prior knowledge check

8.1 3D solids 240
8.2 Reflection and rotation 243
8.3 Enlargement 246
8.4 Translations and combinations of different transformations 250
8.5 Scale drawings and bearings 254
8.6 Constructions 1 258
8.7 Constructions 2 261
8.8 Loci 264
Check up 267
Strengthen 270
Extend 276
Test ready 278
Unit test 280

9 Equations and inequalities 283

Prior knowledge check

9.1 Solving linear inequalities 283
9.2 Solving quadratic equations 1 286
9.3 Solving quadratic equations 2 288
9.4 Completing the square 291
9.5 Solving simple simultaneous equations 294
9.6 More simultaneous equations 297
9.7 Solving linear and quadratic simultaneous equations 299
Check up 302
Strengthen 303
Extend 306
Test ready 308
Unit test 310

10 Probability 312

Prior knowledge check

10.1 Combined events 312
10.2 Mutually exclusive events 315
10.3 Experimental probability 318
10.4 Independent events and tree diagrams 320
10.5 Conditional probability 324
10.6 Venn diagrams and set notation 327
Check up 331
Strengthen 333
Extend 336
Test ready 338
Unit test 340

Mixed exercise 3 342

Answers 346

Index 404