

CONTENTS

Page numbers in bold refer to the amusements; the second page number to the commentary. An asterisk indicates the possible need of a calculator.

Introduction

- 1 Matchstick triangles 1, 75
- 2 A tricky river crossing 1, 75
- 3 The baffled engine driver 2, 75
- 4 Make your own dice 2, 75
- 5 Map folding 3, 76
- 6 The ingenious milkman 3, 76
- 7 Pawns on a chessboard 4, 76
- 8 Avoid three (a game for two players) 4, 77
- 9 Two halves make a whole 5, 77
- 10 Cubism 5, 77
- 11 Matchstick squares 5, 77
- 12 Curves of pursuit (a geometric construction) 6, 77
- 13 The misguided missiles (an extension of 12) 7
- 14 Pattern 8
- 15 The army's predicament 8, 78
- 16 The farmer's sheep-pens 9, 78
- 17 The knight's dance 9, 79
- 18 The railway sidings 10, 79
- 19 The multi-coloured cube 10, 79
- 20 The jealous husbands 11, 80
- 21 The extension lead 11, 81
- 22 Hex (a game for two players) 13
- 23 The square, cross and circle 14, 82
- 24 The Möbius band (a practical activity) 14, 82
- 25 The economical gardener 16, 82
- 26 How many triangles can you see? 16, 83
- 27 The unfriendly power-boats 16, 83
- 28 The knight-guards 17, 83
- 29 Reversing the trains 17, 84
- 30 Quadruplets 18, 84
- 31 Complete the square 18, 85
- 32 Roll a penny 18, 85
- 33 The growing network (a game for two players) 19, 85
- 34 Traversibility 20, 85
- 35 Impossible rotations! 21, 87
- 36 The hunter 21, 87
- 37 Four points in a plane 21, 88
- 38 The letter dice 22, 88
- 39 The queen's defence 22, 88
- 40 Seeing is believing 23, 90

- 41 Inspecting the roads 23, 91
42 Dominoes on a chessboard 23, 91
43 Zigzag (a game for two players) 24
44 Knight's tours 24, 91
45 Sawing up a cube 27, 93
46 The improbable hole 27, 93
47 Identical twins 28, 93
48 The four-colour theorem 28, 93
49 Mystifying matchsticks 28, 94
50 Equilateral triangle to square 29, 94
51 Squaring the urn 29, 95
52 The baffled housewife 29, 95
53 Invert the triangle 30, 95
54 Avoid that snooker 30, 96
55 Squares (a game for two players) 32, 96
56 The hungry bookworm 33, 97
57 Place the motorway junction 33, 97
58 Space filling 34, 97
59 Curves from intersecting circles (attractive geometrical constructions) 34, 97
60 A lover's ultimatum! 36, 98
61 Only four lines 36, 98
62 How fast can you cycle? 37, 99
63 The bob-sleigh run 37, 99
64 Know your vowels 37, 100
65 Games on a pegboard for one to play 38, 100
66 Two of a kind 40, 100
67 Colouring a cube 40, 101
68 Problems of single line working 40, 102
69 Two at a time 41, 102
70 Heads and tails 41, 102
71 Square a Greek cross 41, 102
72 The fuel delivery 42, 102
73 Fair shares 42, 103
74 Coin magic 42, 103
75 The persistent frog 42, 103
76 Tidy that bookshelf! 43, 103
77 Cutting up a circle 43, 104
78 Square relations* 44, 105
79 The numerate gardener* 44, 105
80 Magic triangles 44, 105
81 Number patterns* 45, 107
82 Surprising subtractions* 46, 107
83 How large a number can you get?* 46, 108
84 Four 4s 47, 108
85 What was the sum?* 47, 108
86 Calculator words* 48, 109
87 A calculator crossword* 49, 109

- 88 A mining bonanza* 50, 109
- 89 Hundreds, tens and units 51, 110
- 90 Magic circles 51, 110
- 91 Prelude to a marathon 52, 111
- 92 Find the digits* 52, 111
- 93 Dr Numerati's telephone number* 52, 112
- 94 Make a century 52, 112
- 95 Number wheels 53, 112
- 96 Some calculator challenges* 53, 113
- 97 Division patterns* 54, 113
- 98 Some named numbers* 55, 115
- 99 Magic stars 56, 115
- 100 Safety first 56, 116
- 101 The gambler's secret strategy 57, 116
- 102 The transportation problem 57, 117
- 103 Further number patterns* 58, 117
- 104 Pythagorean triads* 58, 118
- 105 Intriguing multiplications* 59, 118
- 106 A magic diamond 59, 118
- 107 Palindromic dates 60, 119
- 108 'Mind reading' number cards (a number trick to make and use) 60, 119
- 109 3×3 magic squares 62, 120
- 110 4×4 and higher order magic squares 64, 120
- 111 A magic cube* 66, 121
- 112 A question of balance 66, 121
- 113 Further calculator challenges* 66, 121
- 114 A weighing problem 67, 122
- 115 Similar rectangles 67, 123
- 116 Designing a new dartboard* 67, 123
- 117 The only magic hexagon 68, 123
- 118 Nim (a game for two players) 68, 124
- 119 Triangulating a square 69, 125
- 120 Who is 'it'? 69, 125
- 121 Find the cards on the table 69, 125
- 122 Dividing the inheritance 70, 126
- 123 The end of the world! 70, 126
- 124 The sponsored marathon* 71, 127
- 125 The effect of inflation* 71, 127
- 126 Octogenarian occupations* 71, 127
- 127 Tails up! 72, 128
- 128 Dovetailed 73, 128
- 129 More matchstick mindbenders 73, 129
- 130 Bridging the river 74, 129