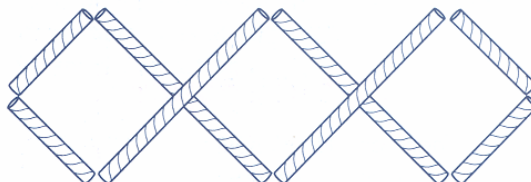


Solutions to Puzzles and Problems for Years 5 and 6

53. Square it up

For example:



54. Joins

Using four numbers:

the highest score is $19 + 15 + 17 + 18 = 69$

the lowest score is $6 + 5 + 2 + 17 = 30$

Using five numbers:

the highest score is $20 + 18 + 13 + 17 + 18 = 86$

the lowest score is $6 + 18 + 2 + 5 + 6 = 37$

Using five numbers and diagonal joins:

the highest is $19 + 17 + 14 + 15 + 18 = 83$

the lowest is $13 + 6 + 20 + 2 + 6 = 47$

55. Money bags

Ram put 1p, 2p, 4p and 8p in the four bags.

Any sum from 1p to 15p can be made with these amounts.

56. A perfect match

A matchbox tray fits into its outer cover in 4 different ways.

A cube will fit into a box with any one of its 6 faces uppermost. Each face can be rotated into any one of 4 different positions. So there are $6 \times 4 = 24$ ways of fitting the cube in the box.

57. Presents

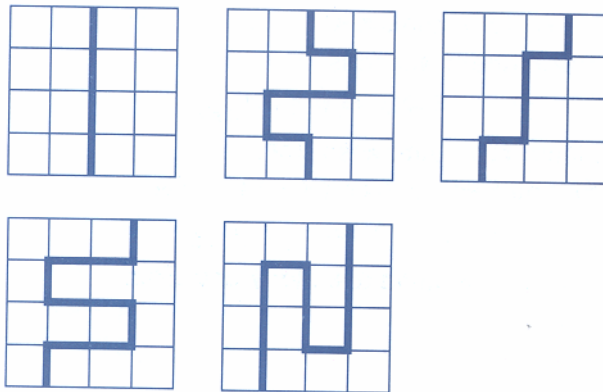
Gurmit paid £2, £4, £6, £1 and £8 for the five presents.

58. Spot the shapes 2

There are 11 triangles.

There are 17 squares.

59. Four by four



60. Three digits

You can make six different numbers.

In order, the numbers are:

799, 889, 898, 979, 988, 997.

61. Make five numbers

For example:

a. $12, 39, 45, 60, 78$

b. $7, 42, 63, 98, 105$

c. $5, 23, 67, 89, 401$

There are other solutions.

62. Maze

There are two routes that total 100 exactly:

$$+6 \quad \times 7 \quad -6 \quad \times 3 \quad -8 \quad = \quad 100$$

$$+9 \quad \times 7 \quad \div 3 \quad \times 5 \quad -5 \quad = \quad 100$$

The route giving the highest total is:

$$+9 \quad \times 7 \quad -6 \quad \times 7 \quad -8 \quad = \quad 391$$

The route giving the lowest total is:

$$+6 \quad \times 7 \quad \div 3 \quad \times 3 \quad -8 \quad = \quad 34$$

63. Jack's book

The book has 221 pages.

42 of the digits are a 5.

64. Flash Harry

Flash Harry's bank balance looked like this:

April -£100

May +£100

June -£200

July +£200

So Harry made £200 overall.

65. Age old problems

I am 48 years old (or possibly 104).

I am now 26 years old. In 38 years' time, when I am 64, my age will be both a square number and a cube.

I am 9 years old now.

66. Zids and Zods

There are 2 Zids with 4 spots and 4 Zods with 9 spots.

If Zids have 5 spots and Zods have 7 spots, the possible ways of making 140 are:

- 28 Zids;
- 21 Zids and 5 Zods;
- 14 Zids and 10 Zods;
- 7 Zids and 15 Zods;
- 20 Zods.

67. Franco's fast food

A curry costs £3.50, a pudding costs £1 and a tea costs 50p.

So the total cost of a curry, a pudding and a tea is £5.

68. Albert Square

For example:



69. Coins on the table

Anna put 12 coins on the table.

70. A bit fishy

Nasreen bought 4 angel fish and 8 goldfish.

71. Pet shop

Jim sold the dog and the cat for £72 and £48 respectively, a total of £120.

The dog cost £50 and the cat cost £75, a total of £125. The cat and the dog were sold for a total of £120, so Jim made a loss of £5.

72. Shape puzzle

The circle has the value 5.

The triangle has the value 8.

The club has the value 6.

▲	♣	▲	○	27
♣	○	♣	▲	25
○	○	○	○	20
▲	♣	♣	▲	28
27	22	25	26	

73. Eggs

Mrs Choy bought:

10 large eggs at 50p each,

10 medium eggs at 10p each,

80 small eggs at 5p each.

74. Anyone for tennis?

Ali, Luke, Holly and Zoe play tennis.

Two boys can play.

Ben won't play if Luke plays.

So the two boys must be Ali and Ben, or Ali and Luke.

Ali will play only if Holly plays.

Holly won't play with Ben.

So the two boys are Ali and Luke.

Luke will play only if Zoe plays.

So the two girls are Holly and Zoe.

75. Bus routes

There are six different routes from A back to A:

A B C D E F A
A B D C E F A
A B D E C F A

and the three reversals of these.

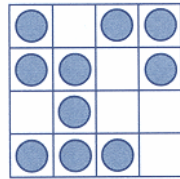
The cheapest routes are A B D E C F A and its reversal, which each cost £21.

76. Slick Jim

Jim won £540 000.

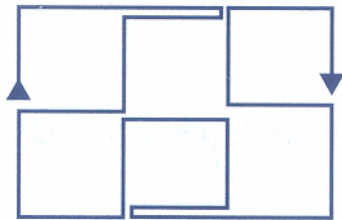
77. All square

For example:

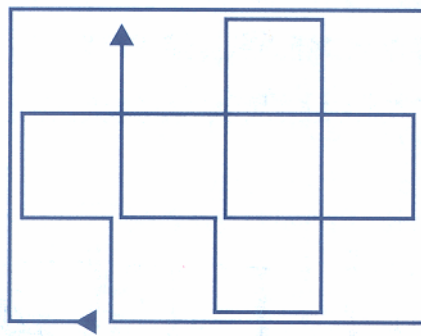


78. Sleigh ride

With 3 rows of 4 igloos, the shortest route is 190 metres. For example:



With 4 rows of 5 igloos, the shortest route is 350 metres. For example:



79. Spendthrift

Anil bought 13 choc bars and 9 fruit bars, or 4 choc bars and 22 fruit bars.

80. Cola in the bath

A bath 1.5 metres long by 60cm wide would have a floor area of approximately 9000 cm^2 . If there was 10cm of cola in the bath, the volume of liquid would be about $90\,000 \text{ cm}^3$ or 90 000ml. This would require roughly 270 cans of cola.

81. Millennium

00:33:20	1 January 2000
09:20:00	2 January 2000
08:00	23 March 2000
00:00	23 June 2005
00:00	1 May 2038

82. People in the crowd

There is no precise answer, but pupils can compare their estimates and discuss how they arrived at them.

83. Make 200

There are 22 different solutions. Eleven of the solutions are as follows:

<table border="1"><tr><td>1</td><td>9</td></tr><tr><td>7</td><td>2</td></tr></table>	1	9	7	2	<table border="1"><tr><td>2</td><td>8</td></tr><tr><td>6</td><td>3</td></tr></table>	2	8	6	3	<table border="1"><tr><td>2</td><td>9</td></tr><tr><td>5</td><td>3</td></tr></table>	2	9	5	3	<table border="1"><tr><td>3</td><td>5</td></tr><tr><td>7</td><td>4</td></tr></table>	3	5	7	4
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6	1																		
5	7																		
6	2																		
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7	1																		
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Eleven more solutions are formed by changing over the two digits in the top right and bottom left boxes.