LMI Puzzle test 'Dutch Treat with a German Twist'
7ᵀᴴ – 9ᵀᴴ September 2013
By Richard Stolk

Instruction Booklet

Since I don't have my own weblog, I consider my user page in the puzzle portal of Logic Masters Germany my puzzle home. Over the years I have published a variety of different puzzles and puzzle variants in the portal and I have chosen some of these puzzle types to form my first puzzle test for LMI. Since some of the puzzle types in this test are relatively unknown, I will provide links to extra practice material in the forum, so players can have a decent preparation to this test.
I hope you enjoy solving the puzzles as much as I did thinking about and creating them!

What you need to know:
- The duration of the test is 120 minutes;
- Some of the puzzles in the IB will be easier than the corresponding puzzle in the real test while other puzzles in the IB will be harder. This means that the level of difficulty of the puzzles in the IB does not correspond to the distribution of points over the puzzles in the real test.
- The distribution of points is based on the times needed by test solvers. Therefore, you might experience differences due to your own personal skills and preferences;
- The puzzle booklet will contain 10 pages, without cover page and points table;
- This test uses *instant grading* where a solver can submit any individual puzzle once finished and receive confirmation that the solution is correct or not. Each incorrect submission reduces the puzzle's potential score. The first, second, third, and fourth incorrect submission reduces the potential score to 90%, 70%, 40%, and 0% respectively. (Afterwards, the puzzle's potential score remains 0%.)
- If you submitted all solutions correct you can have bonus points. Your final score is then calculated using the formula: Final Score = Total Points / Used Time * 120 minutes.

Many thanks go to Hans Eendebak, René Gilhuijs, Robert Beärda, Roland Voigt, Tim Peeters and Wilbert Zwart for test solving and to LMI for hosting this contest.

Good Luck and Have Fun!

	Points distribution	
1	Killer Skyscrapers	26
2	Killer Skyscrapers	38
3	Regional Yajilin	27
4	Regional Yajilin	83
5	Capsules	14
6	Capsules	57
7	Masyu Battleships	29
8	Masyu Battleships	26
9	Easy as Chaos ABC	44
10	City Construction	64
11	Easy as ABC - No Touch	40
12	Spiral City Construction	74
13	Filled Loop	60
14	Pentomino in the Box	58
15	Japanese Sums Pentominos	64
16	Sudokakuro	87
17	X-Sums Sudoku	18
18	Domino Loop	81
19	Prime Domino	35
20	Blackout Domino	75
	TOTAL	1.000

1 & 2 KILLER SKYSCRAPERS (26 & 38 POINTS)

Place the digits from 1 to 5 *(6 in the lower grid)* inside the bold outlined area in every row and column. Each digit represents a skyscraper with a height that corresponds with the digit. Digits outside the bold outlined area represent the number of skyscrapers that is visible from that view point. Higher skyscrapers hide lower skyscrapers. The numbers placed in each marked cage must sum to the total given in its top-left. Numbers must not repeat in cages.
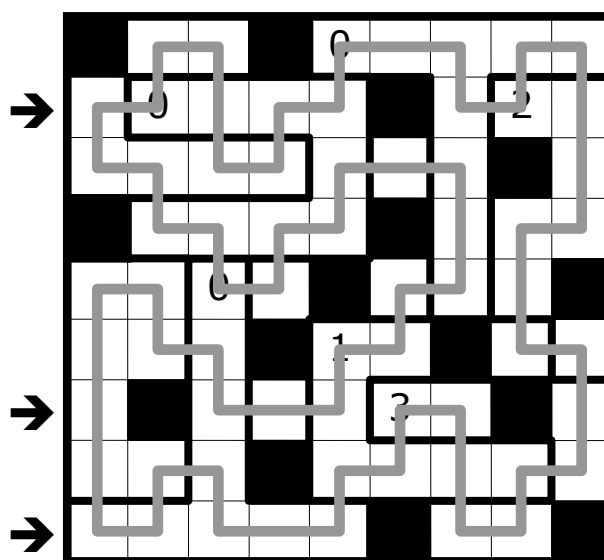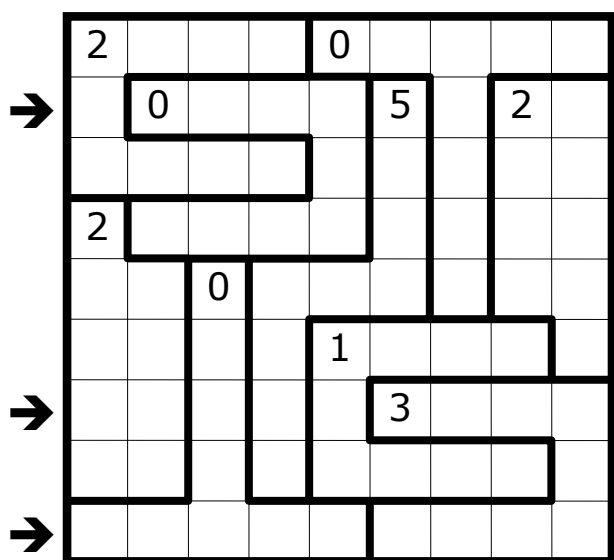
Answer key: The digits in the marked rows inside the bold outlined area. *(Example: 35214, 41532)*
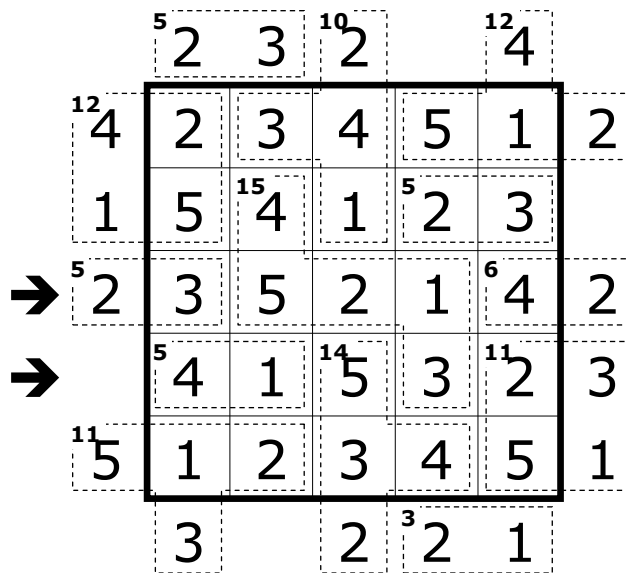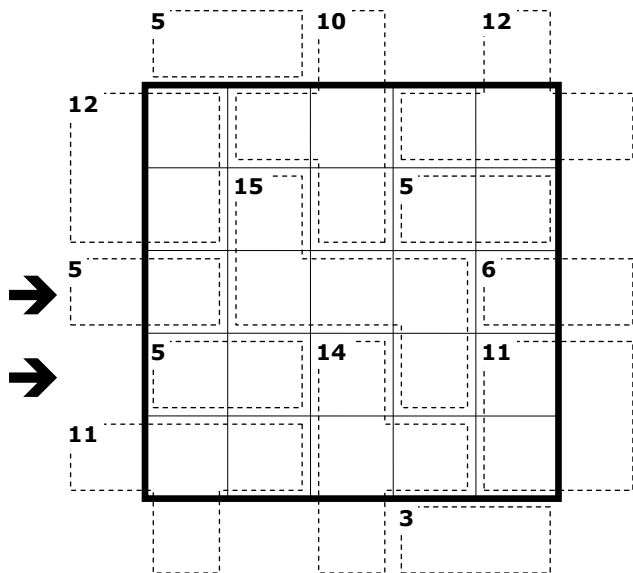
3 & 4 REGIONAL YAJILIN (27 & 83 POINTS)

Paint some cells black. Black cells are not allowed to be orthogonally adjacent. Draw a closed loop that passes through all the remaining white cells. The loop does not cross or overlap itself. A number in a bold outlined area indicates the number of black cells in that area. Cells with numbers are either part of the loop or have to be painted black.
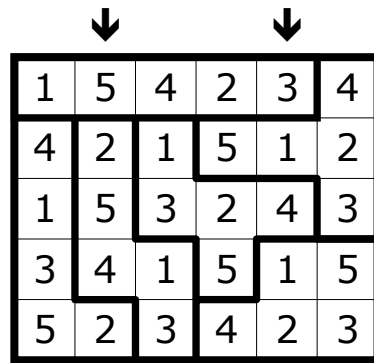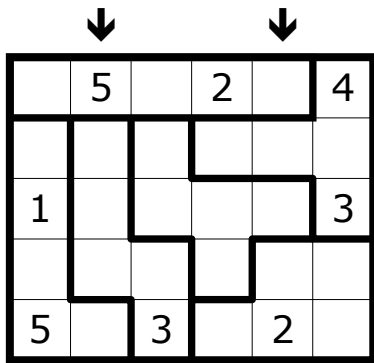
Answer key: For each of the marked rows the number of black cells. *(Example: 122)*

5 & 6 CAPSULES (14 & 57 POINTS)

Place the digits from 1 to 5 in every bold outlined area. Equal digits must not touch each other, not even diagonally.
Answer key: The digits in the marked columns. *(Example: 52542, 31412)*

	5		2		4
1					3
5		3		2	

1	5	4	2	3	4
4	2	1	5	1	2
1	5	3	2	4	3
3	4	1	5	1	5
5	2	3	4	2	3

7 & 8 MASYU BATTLESHIPS (29 & 26 POINTS)

Draw a single closed loop passing through all circles in the grid. The loop must make a 90° angle at all black circles and go straight for at least two cells in both directions before turning again. The loop must go straight through all white circles and make a 90° angle in at least one of the adjacent cells ni the loop direction.
In all cells that are no part of the Masyu, the battleship fleet has to be placed. Ships don't touch each other, not even diagonally.
Answer key: for each marked column the number of cells occupied by ship parts. *(Example: 323).*
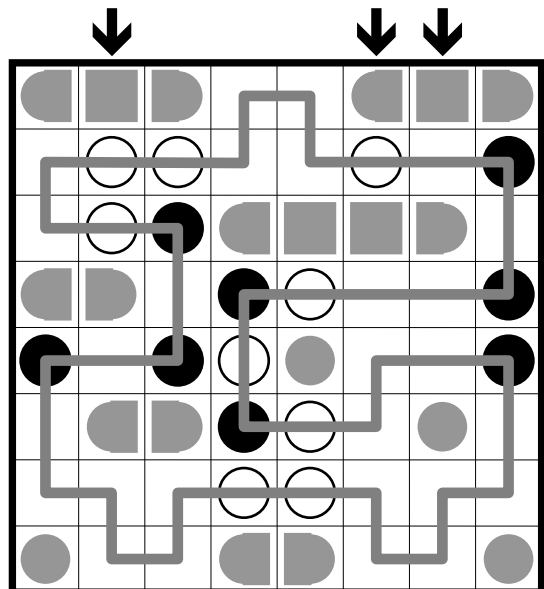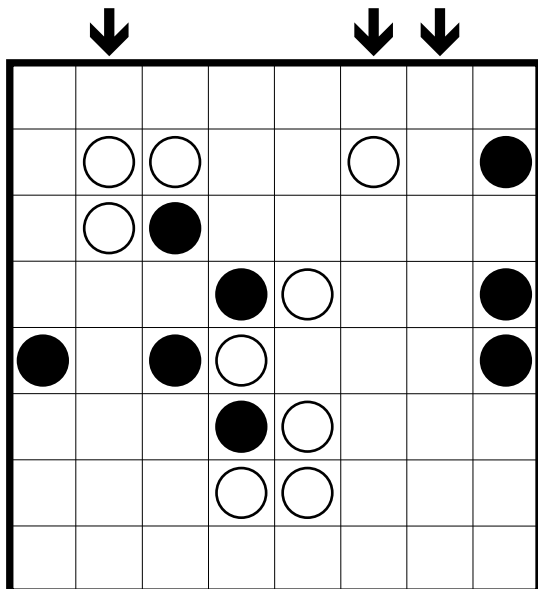
9 EASY AS CHAOS ABC (44 POINTS)

Place the letters from A to E *(A to D in IB)* in every row, column and bold outlined irregular area. Two cells per row, column and area remain empty. The letters outside the grid indicate the position of that letter, ignoring empty cells.
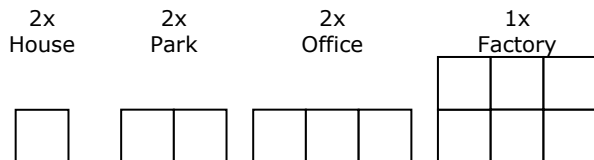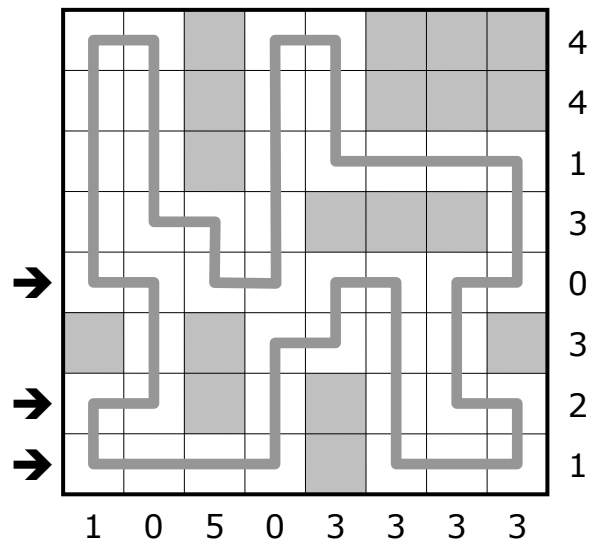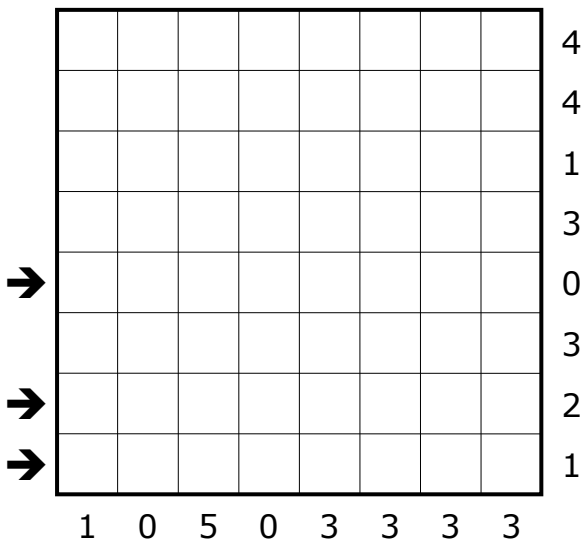Answer key: The content of the marked rows; '-' for empty cells. *(Example: D--CBA, B--ACD)*
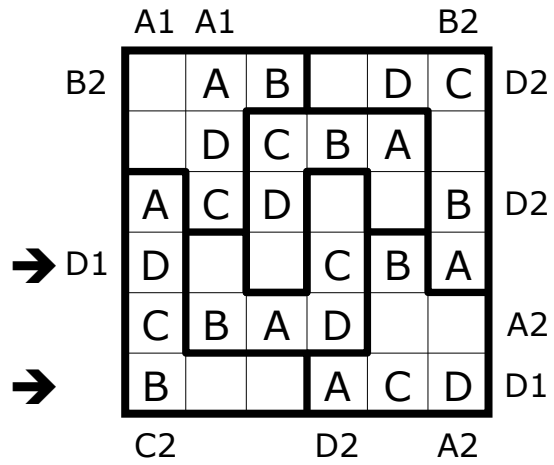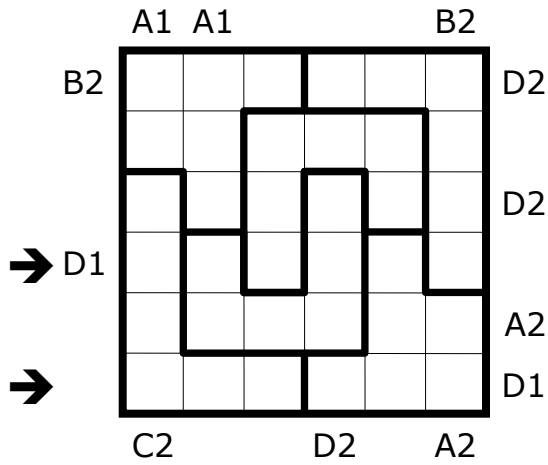
10 CITY CONSTRUCTION (64 POINTS)

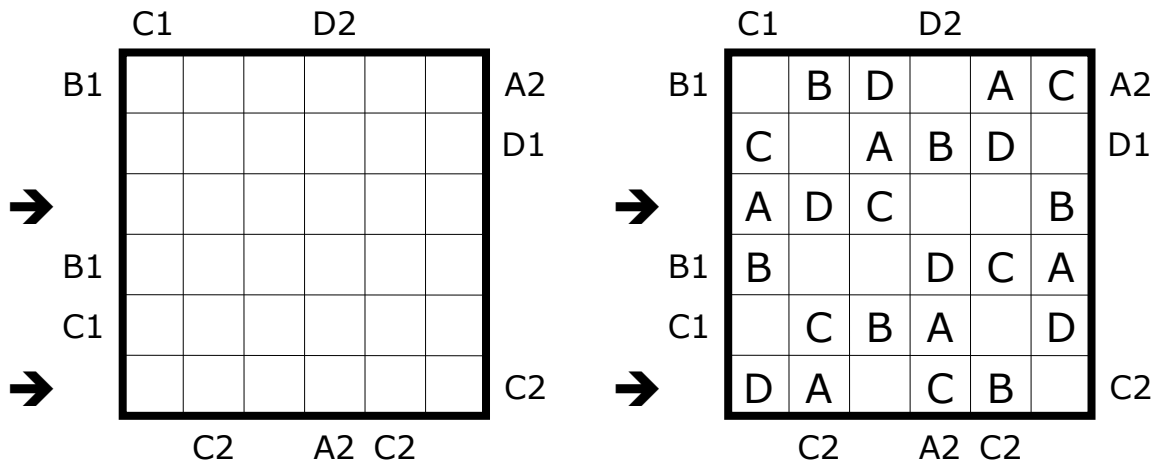Place all buildings in the grid. Buildings may be rotated. They may not touch each other, not even diagonally. Digits outside the grid represent the number of cells in that row or column used by buildings. Draw a closed loop that passes through all the remaining white cells. The loop does not cross or overlap itself.
Answer key: For each of the marked rows the number of 90° angles of the loop. *(Example: 844)*

11 EASY AS ABC - NO TOUCH (40 POINTS)

Place the letters from A to E *(A to D in IB)* in every row and column. Two cells per row and column remain empty. The letters outside the grid indicate the position of that letter, ignoring empty cells.
Equal letters must not touch each other diagonally.
Answer key: The content of the marked rows; '-' for empty cells. *(Example: ADC--B, DA-CB-)*

12 SPIRAL CITY CONSTRUCTION (74 POINTS)

Place all buildings in the grid. Buildings may be rotated. They may not touch each other, not even diagonally.
Draw a closed loop that passes through all the remaining white cells. The loop does not cross or overlap itself.
The given grid is a spiral. Building segments are numbered from 1 to 30 *(1 to 18 in IB)*, starting from the entrance of the spiral (top left) and moving towards the center. The numbers outside the grid represent the sum of the building segments in the corresponding row or column.
Answer key: For each of the marked rows the number of 90° angles of the loop. *(Example: 844)*

| 2x | 2x | 2x | 1x |
| House | Park | Office | Factory |
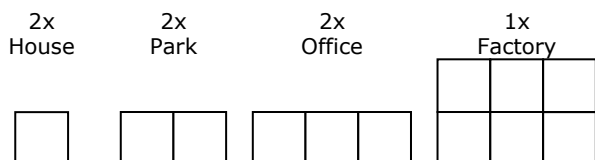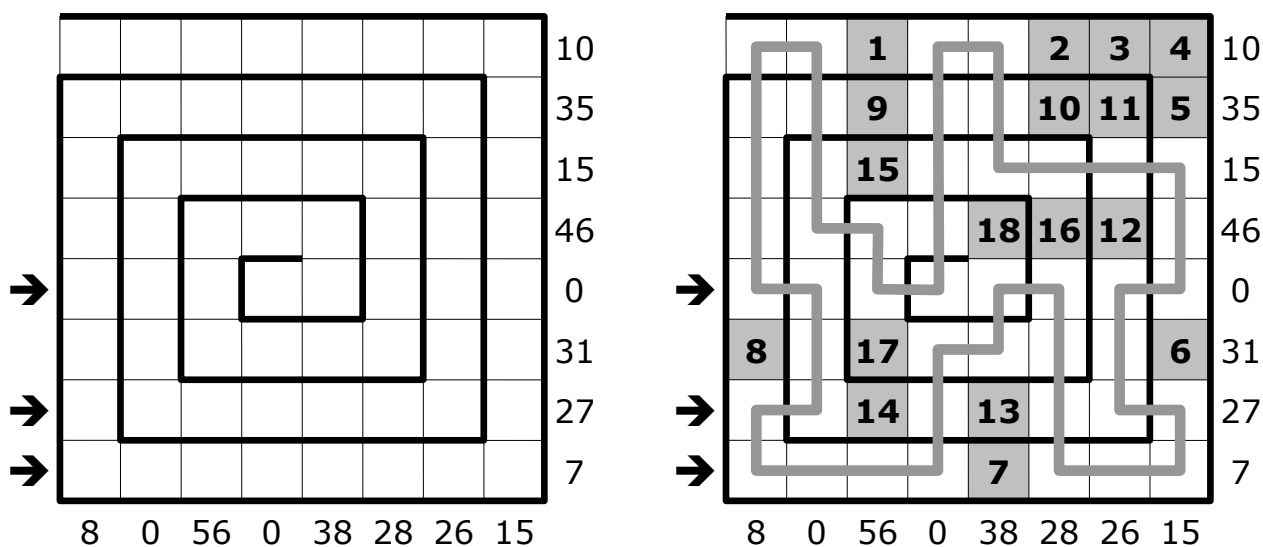
13 FILLED LOOP (60 POINTS)

Draw a single closed loop along the grid lines. The loop does not cross or touch itself. The numbers in the grid indicate how many sides of the cell are used for the loop. Fill the loop with the 12 pentominos. *(In the IB only pentominos FILNPT.)*; inside the loop are exactly 60 cells. Adjacent pentominos touch each other at exactly one border segment. There is no point where three or more pentominos meet. The pentominos may be rotated and/or mirrored.
Answer key: for the marked rows the letters of the first 3 appearing pentominos in order of appearance; '-' if there are not enough pentominos. *(Example: TF-, TLF)*
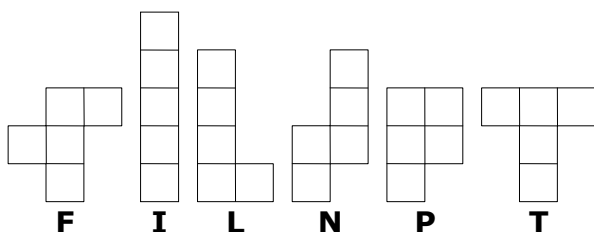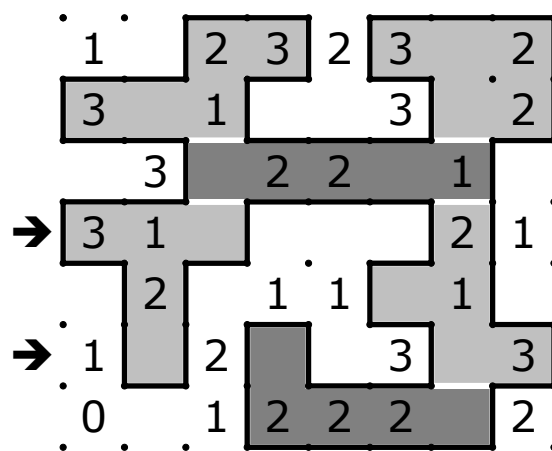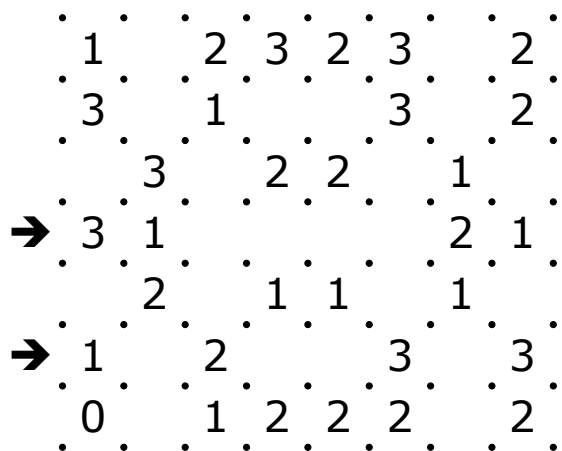
14 PENTOMINO IN THE BOX (58 POINTS)

Place the 12 pentominos *(in the IB only pentominos FILNPT)* in the grid, in such a way that they don't touch each other, not even diagonally. The pentominos may be rotated and/or mirrored. Every bold outlined area contains exactly three cells that belong to two different pentominos.
Answer key: for the marked rows the letters of the first 3 appearing pentominos in order of appearance; '-' if there are not enough pentominos. *(Example: LT-, NPF)*
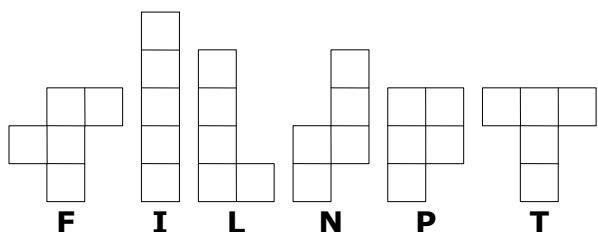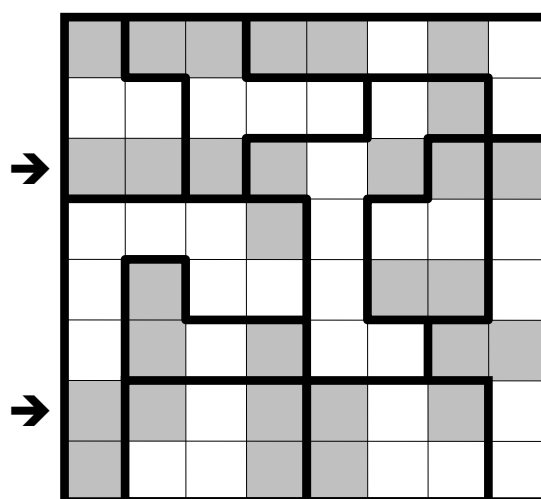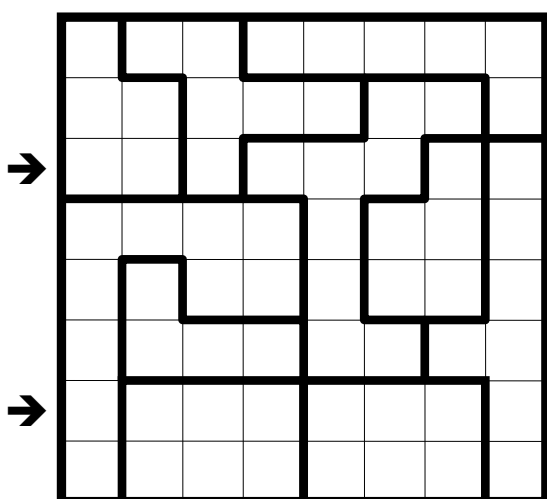
15 JAPANESE SUMS PENTOMINOS (64 POINTS)

Place all 12 pentominos *(in the IB only pentominos FILNPT)* in the grid. The pentominos may be rotated and/or mirrored. The numbers outside the grid represent the sums of the blocks of cells covered by pentominos in the respective row or column. The numbers are arranged in ascending order.
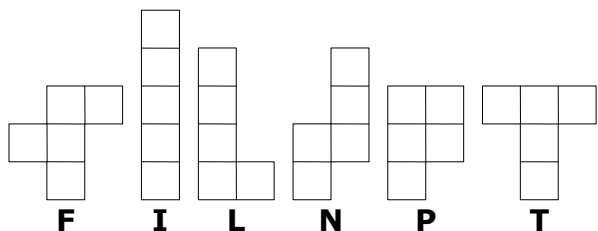Answer key: for the marked rows the letters of the first 3 pentominos in order of appearance; '-' if there are not enough pentominos. *(Example: LPT, LN-)*

Left grid (example):

Column clues:
```
              3  2
        3  1  3  4  2
     1  3  4  4  4  2
     8  4  4  4  5  3
```

Row clues	1	3	4	3	2	1
1 13	1	3	4	3	2	1
6	1	3	1	3	1	2
1 2 3 5	1	4	1	2	3	2
→ 3 3 7	3	1	2	1	4	2
1 2 3 4	2	2	1	1	2	2
→ 2 8	2	3	1	4	3	4

Right grid (solution) — same numbers with bold pentomino outlines.

Pentomino shapes: **F   I   L   N   P   T**

16 SUDOKAKURO (87 POINTS)

Place the digits from 1 to 7 *(1 to 6 in IB)* in every row, every column and every bold outlined irregular area. The numbers in the dark grey cells are the sums of the digits in the reading direction.
Answer key: The content of the marked rows. *(Example: 235146, 261543)*

Left grid (puzzle) with clues: 13, 4, 10, 2, 9/3, 5, 9, 7, 10, 11/4, 9, 12/14, 10, 10, 1, 10, 3/4, 8

Right grid (solution):

		1	3	5	4	6		2
10	4	6		2	9/3	3	1	5
5	5	9	1	6	2	7	3	4
→ 10	2	3	5	11/4	1	4	6	
→	9	2	6	1	12/14	5	4	3
10	6	4	10	3	5	2	1	1
10	1	5	4	3/4	3	8	2	6
	3		2	4	6	1	5	

17 X-SUMS SUDOKU (18 POINTS)

Place the digits from 1 to 7 *(1 to 6 in IB)* in every row, column and bold outlined area. Numbers outside the grid indicate the sum of the first X digits in the corresponding direction. X is the first digit in the corresponding direction.

Answer key: The digits in the marked rows. *(Example: 416352, 235641)*
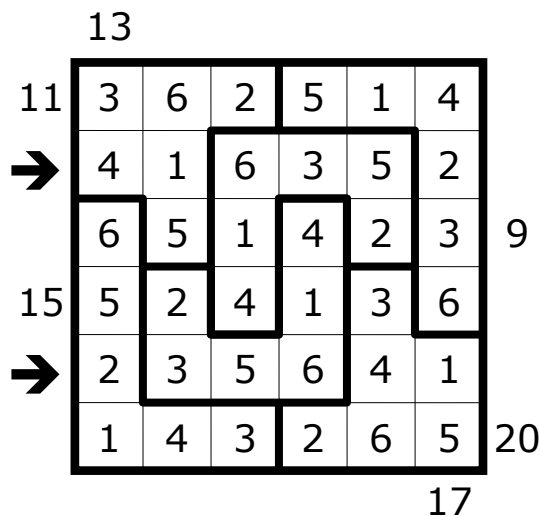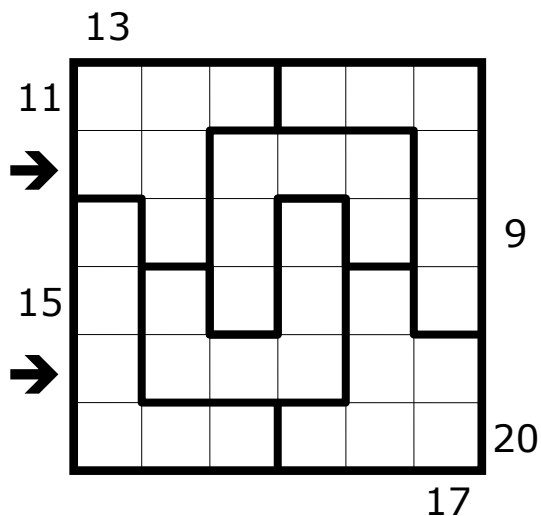
18 DOMINO LOOP (81 POINTS)

Place the given domino tiles in the grid in such a way that they form a closed loop that does not touch itself, not even diagonally. The normal domino rules have to be followed: adjacent cells covered by different tiles contain equal numbers. The numbers above and on the left of the grid represent the number of cells occupied by dominos in the respective row or column. The numbers below and on the right of the grid represent the sum of the digits on dominos in that row or column. The grey cells are part of a domino with two equal digits.

Answer key: The content of the marked rows; '-' for empty cells. *(Example: 3-2-1-3, 4-0-222)*

19 PRIME DOMINO (35 POINTS)

The dominos 0-0 to 6-6 *(0-0 to 4-4 in the IB)* have been arranged to form a rectangle of 7 by 8 cells; after that the outlines of the domino tiles and some of the digits have been removed. Reconstruct the missing digits and lines in such a way that every domino appears exactly once in the diagram. The digits in the grey cells are part of a domino of which the sum of both digits is a prime number. (Relevant prime numbers: 2,3,5,7,11)
Answer key: The missing numbers, row by row, top to bottom. *(Example: 41324410)*

4	0	0		3
	0	3		1
0		4		
0	3	1		2
3	2		3	1
4	2	1	2	2

Dominos: 0 0 | 0 1 | 1 1 | 0 2 | 1 2 | 2 2 | 0 3 | 1 3 | 2 3 | 3 3 | 0 4 | 1 4 | 2 4 | 3 4 | 4 4

4	0	0	4	3
1	0	3	3	1
0	2	4	4	4
0	3	1	1	2
3	2	0	3	1
4	2	1	2	2

20 BLACKOUT DOMINO (75 POINTS)

Paint some cells black and place all given domino tiles in the grid in such a way that they don't overlap. Two orthogonal adjacent cells from different domino tiles must be equal. Black cells must not touch the border nor each other orthogonally.
Answer key: the content of the marked columns, 'B' for black cells. *(Example: 44B000, 111B3)*

Dominos: 0 0 | 2 2 | 0 1 | 2 3 | 0 2 | 2 4 | 0 3 | 3 3 | 0 4 | 3 4 | 1 1 | 4 4 | 1 2 | 1 3 | 1 4