forsmarts 6 puzzle book

WPC Placement

Author - Andrey Bogdanov

Place all the given figures in the corresponding grids without touching and/or overlapping. You can rotate figures, but cannot mirror them. Numbers outside indicate the quantity of half-cells covered by the figures.
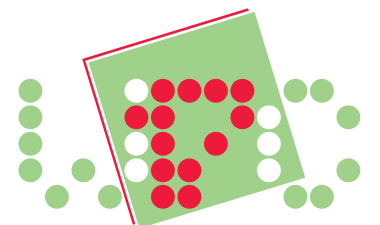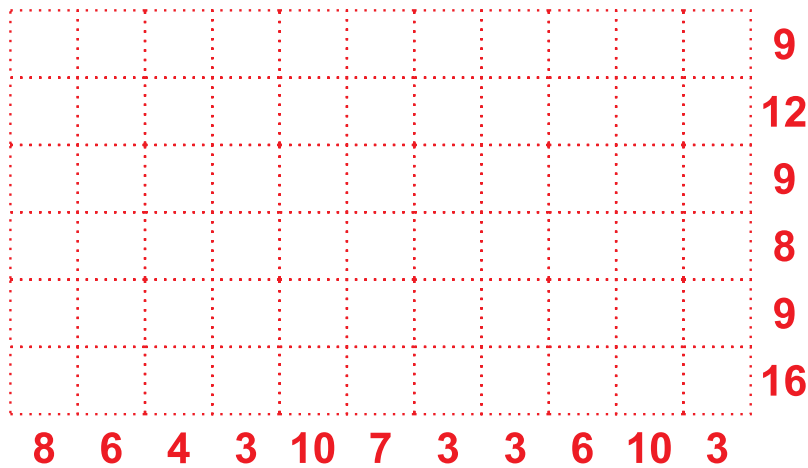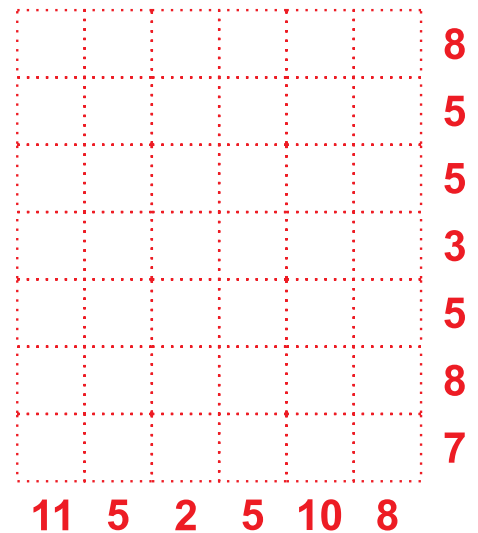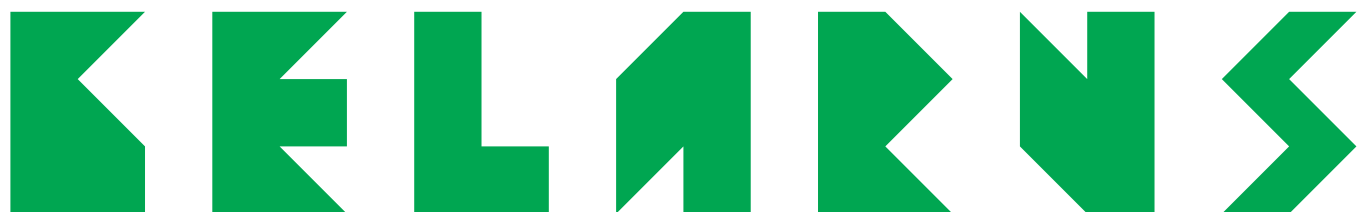
17th World Puzzle Championship
MINSK, BELARUS, 2008

Author - Vladimir Portugalov

7th Belarusian Puzzle Championship

Part I
Sudoku Variations
(50 minutes)

7-й открытый
Чемпионат Беларуси
по решению головоломок

1. Sudoku with extraregions

Fill the grid with numbers 1 through 9. Each row, column, outlined 3x3 box and shaded area must contain these numbers exactly once.

2. Touchy Sudoku

Fill the grid with numbers 1 through 9. Each row, column and outlined 3x3 box must contain these numbers exactly once. Every number in the grid must have at least one consecutive neighbour in the adjacent cells.

3. Odd Sums Sudoku

Fill the grid with numbers 1 through 9. Each row, column and outlined 3x3 box must contain these numbers exactly once. Sum of the numbers in each shaded area must be odd.

Odd Sums Sudoku solution:

7	4	1	8	5	3	2	6	9
5	3	6	9	4	2	8	7	1
2	9	8	1	7	6	3	4	5
9	6	5	2	3	7	4	1	8
4	2	7	5	1	8	9	3	6
1	8	3	6	9	4	5	2	7
8	7	4	3	6	9	1	5	2
6	1	9	4	2	5	7	8	3
3	5	2	7	8	1	6	9	4

4. Quad Sudoku

Fill the grid with numbers 1 through 9. Each row, column and outlined 3x3 box must contain these numbers exactly once. Numbers in the shaded areas must be cosequtive (treat 9 and 1 as consecutive numbers in this puzzle).

Quad Sudoku solution:

5	3	2	1	8	4	9	7	6
4	6	7	9	2	3	8	1	5
9	1	8	5	6	7	4	2	3
6	7	9	3	1	5	2	4	8
8	5	4	2	9	6	1	3	7
3	2	1	7	4	8	5	6	9
1	9	5	6	3	2	7	8	4
7	8	3	4	5	1	6	9	2
2	4	6	8	7	9	3	5	1

5. Pencilmarks Sudoku

Fill the grid with numbers 1 through 9. Each row, column and outlined 3x3 box must contain these numbers exactly once. All possible options for the white cells are given. Grey cells can contain any number.

Pencilmarks Sudoku solution:

| 8	1	6	7	2	4	9	3	5
4	9	2	5	3	6	1	8	7
7	5	3	1	9	8	4	6	2
9	8	4	3	7	1	5	2	6
3	2	1	6	8	5	7	4	9
6	7	5	2	4	9	3	1	8
5	4	9	8	1	2	6	7	3
1	3	8	9	6	7	2	5	4
2	6	7	4	5	3	8	9	1

Part II

Assorted puzzles

(90 minutes)

1. Countries (60 points)

Divide the grid into seven areas. Each area must contain a letter. Digits outside the grid show the quantity of cells belonging to the area that touches the border in corresponding place. Each area must touch the border of the grid.
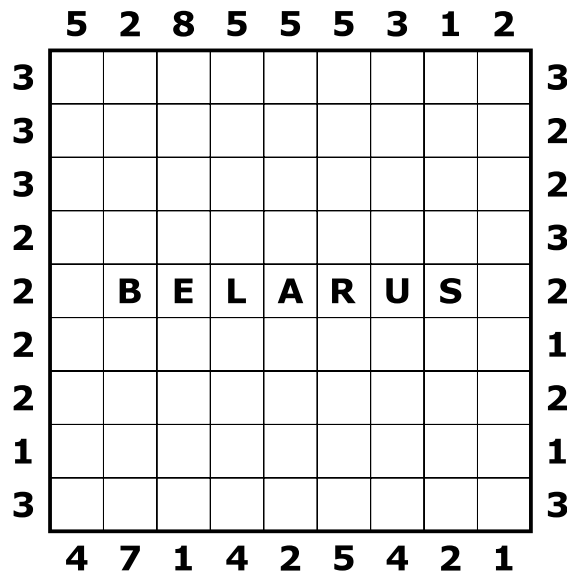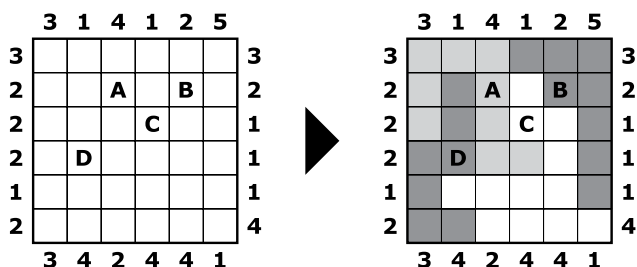
2. Magic 7 (44 + 55 points)

Fill the grids with the numbers 1 through 5 (6). Each row, column and main diagonal must contain these numbers exactly once. Sum of the numbers in each outlined area must be equal to 7.
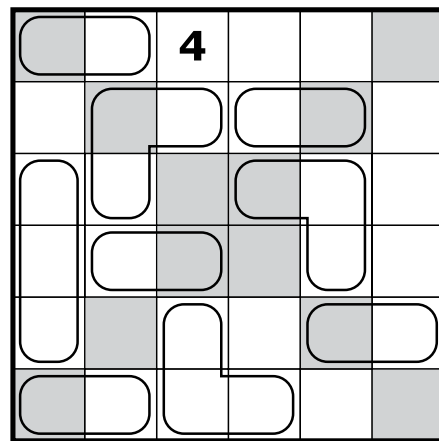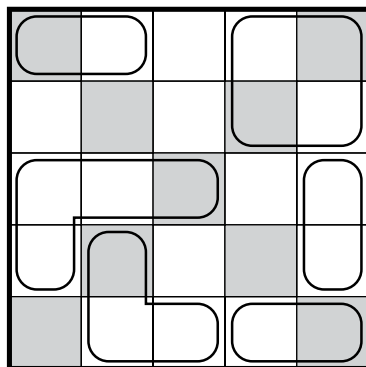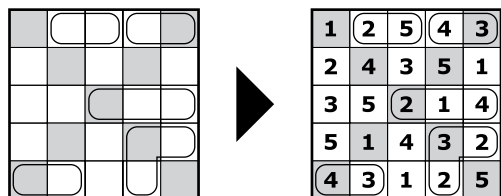
3. Boomerang (66 + 66 points)

Divide each grid along the gridlines into some "boomerangs" (two-legged figures, legs are of the same size and they create 120 degree angle). Each figure must contain exactly one black circle. There must be no free cells after dividing.
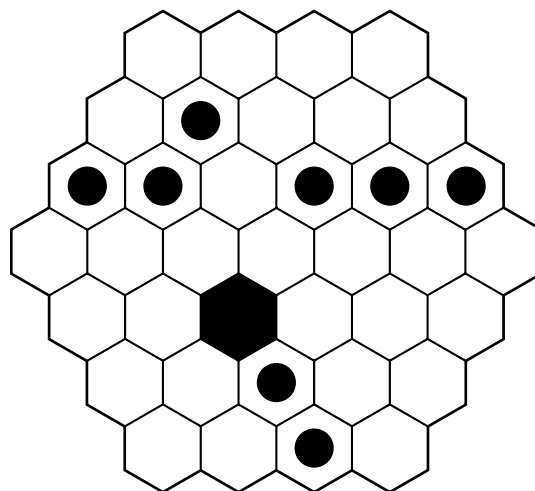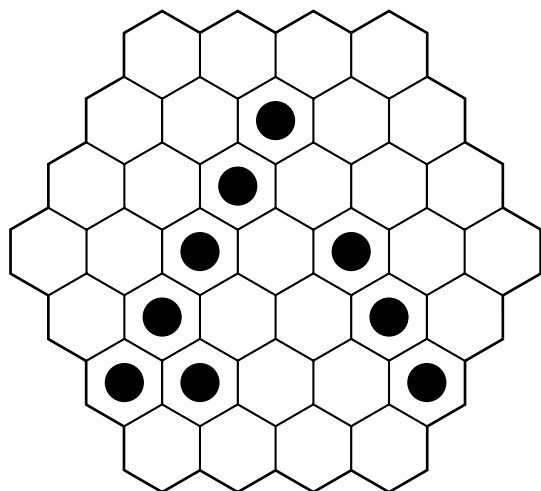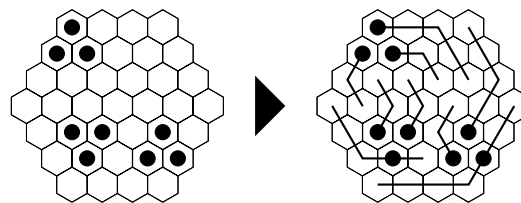
4. Star battle (88 points)

Place in the grid one-cell stars, so that each row, each column and each shape outlined in black contain exactly two stars. The stars cannot touch each other, not even diagonally.

5. Product pairs (33 + 33 points)

Place in the grid the numbers 1 through 14, each once. Each row and column must contain exactly 2 numbers. Products of these 2 numbers are given outside the grid.

					72
9			8		
	2			3	6
5		6			30
			1	10	10
	7		4		28

45 14 6 32 30

First grid column products (left puzzle):

							99
							48
							60
							10
							91
							24
							14

78 10 12 70 77 18 96

Second grid:

							12
							14
							36
							60
							24
							70
							143

130 77 16 54 60 12 14
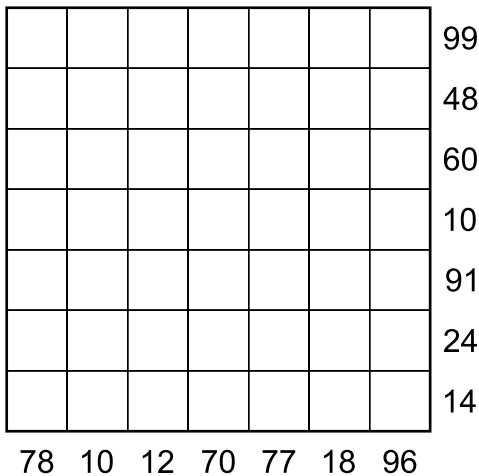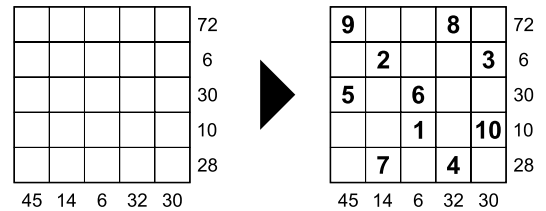
6. Futoshiki (101 points)
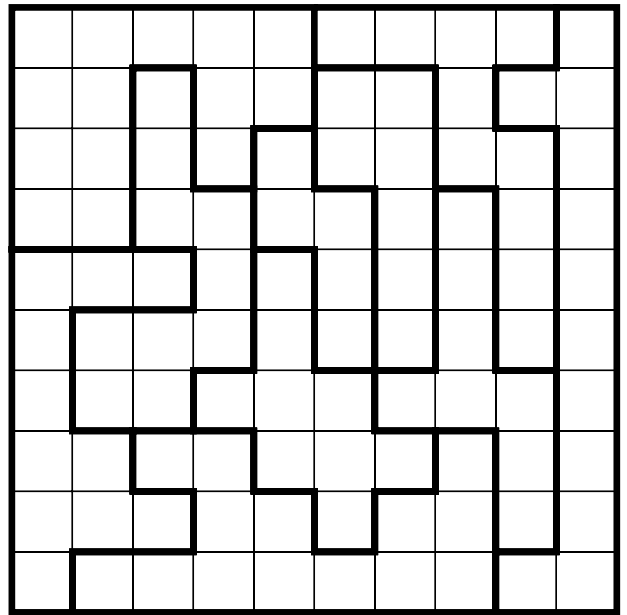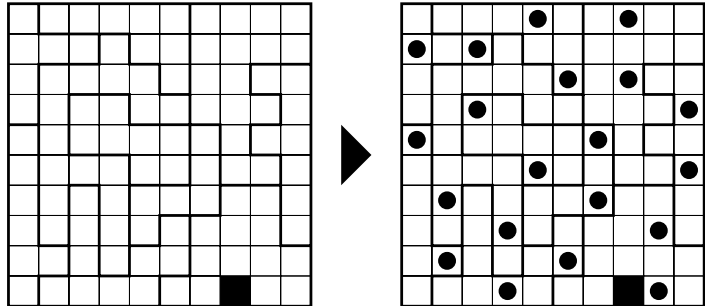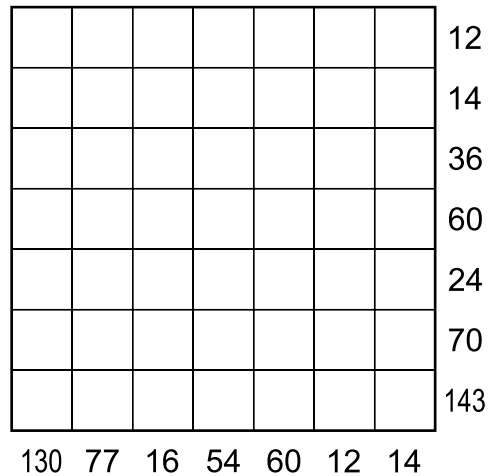
Fill in the grid with the numbers 1 through 7. Each row and column must contain these numbers exactly once. All comparison signs must be true.

Example solution:

5	3	4	7	1	2	6
2	7	6	4	5	1	3
6	5	3	2	7	4	1
1	2	7	6	3	5	4
4	6	5	1	2	3	7
7	1	2	3	4	6	5
3	4	1	5	6	7	2
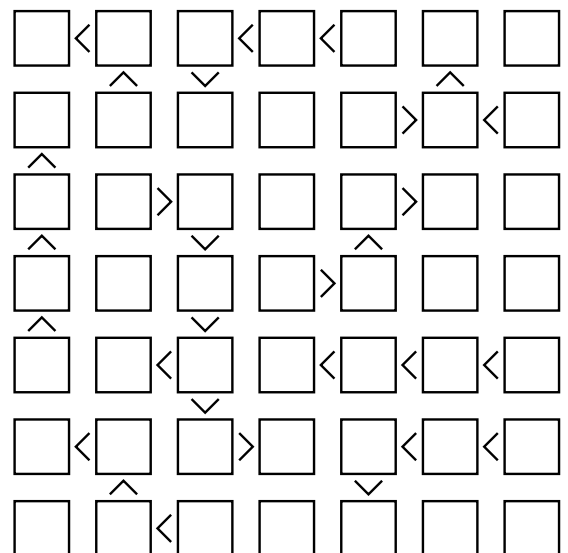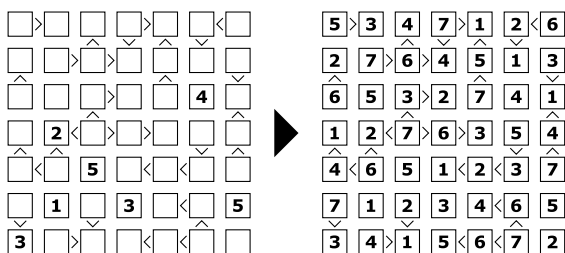
7. Worms (33 points)

Place in the grid 7 worms, 7 cells long each. The worms cannot touch or cross themselves or each other. Their heads are marked by circles. The worms cannot pass through the dark cells.
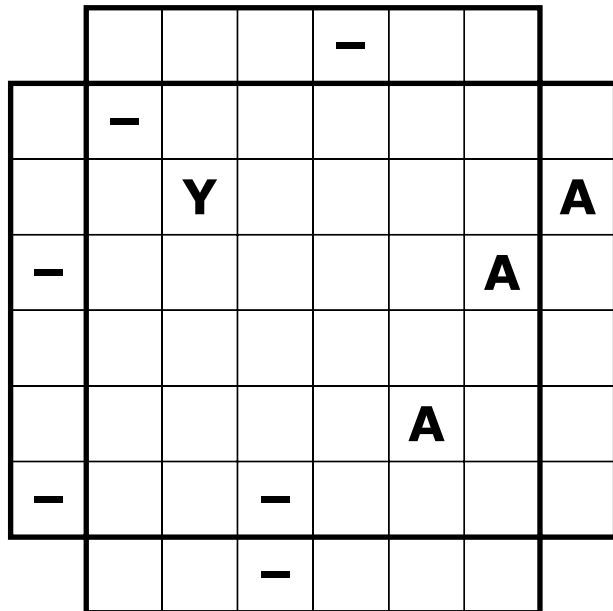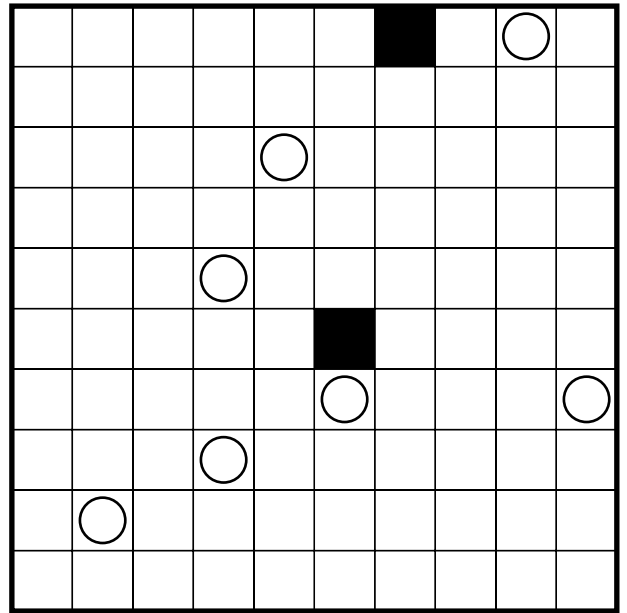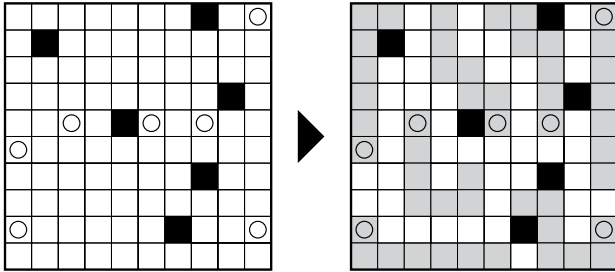
8. Ayda (91 points)

Place in the grid some letters so that in every row and column word AYDA could be read, in any direction.
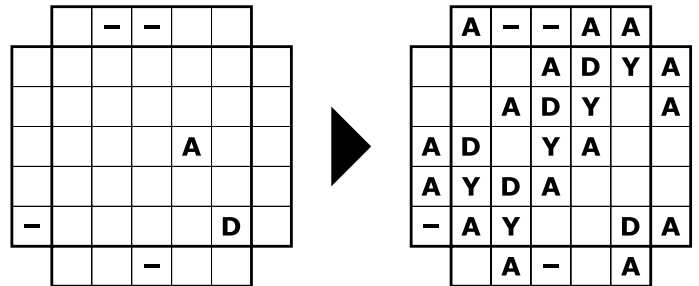
9. Number loop (55 points)

Draw the single closed loop, not touching or intersecting itself, going only horizontally or vertically and passing through the centers of the cells. Numbers occupied by the loop cannot be repeated within single row and column. Sums of those numbers are shown outside the grid.

5	4	1	3	5	1	8
4	1	2	5	4	3	12
3	2	5	4	1	2	11
2	4	3	1	5	4	11
4	5	1	2	3	1	15
1	3	4	1	2	3	8

   9 15 12 11 13   5
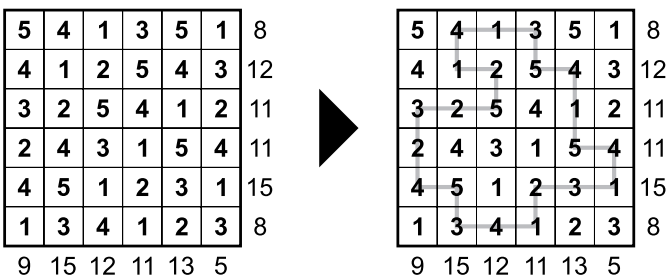
6	5	2	3	4	7	1	2	17
2	4	7	6	1	5	3	5	21
5	2	1	5	6	3	7	4	17
1	3	5	4	2	6	2	7	28
7	6	3	1	4	3	6	2	19
3	4	1	6	3	2	4	5	15
4	7	6	4	2	1	5	1	25
2	1	4	7	5	4	3	6	19

   19 23 28 21 15 19 22 14

10. Hehagonal cross-math (81 points)

Fill the grid with two sets of numbers 1 through 9 and signs "+" (plus), - (minus) and * (times), so that around every circle appeared the arithmetic expression with the result shown in that circle. The expression starts in the cell with the dark triangle and goes clockwise. The expression cannot start or end with the sign and contain two or more consecutive signs. The priority of the operations is usual (first multiplication and then addition and subtraction).
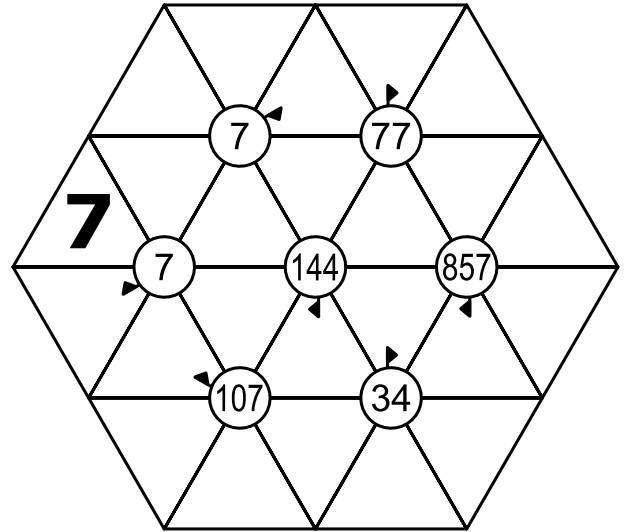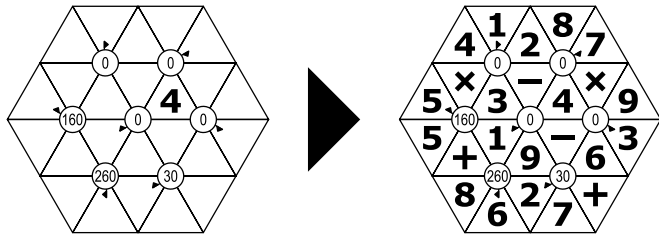
11. Expression search (18 points x 10)

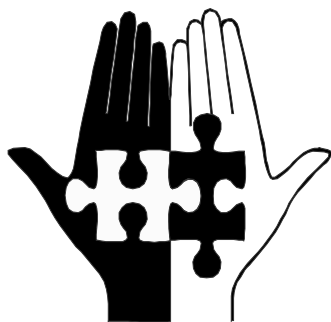| 2	7	*	6	5	4	+	1	3	8
+	3	7	2	1	1	*	6	3	7
9	1	−	2	8	3	−	6	*	3
*	2	7	1	−	4	9	7	1	−
3	*	6	+	7	+	8	−	9	5
4	6	8	8	+	7	1	5	5	8
1	4	5	1	4	7	+	3	4	+
−	3	*	9	6	5	3	2	*	4
5	4	*	7	1	1	*	8	4	9
9	2	6	4	+	8	3	5	7	8

Find in the grid 10 expressions with the given results. Expressions must be read straight, in any direction (horizontal, vertical or diagonal). Each expression should contain exactly one sign of arithmetic operation.

7 = _____

70 = _____

100 = _____

101 = _____

777 = _____

1000 = _____

1234 = _____

2008 = _____

7007 = _____

70707 = _____

1	4-3
28	43-15
40	9+31
90	84+6
210	35*6
720	714+6
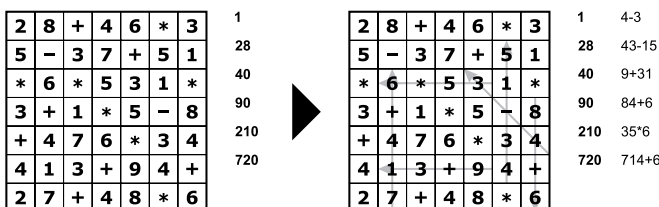
Part III

Classic sprint - 7

(50 minutes)

This part consists of quite classic puzzles, so there's no instructions for them. If you really need the instructions you can easily find it in the internet. Note that in this part each pair of connected grey cells must contain the same number. Puzzle counts as solved ONLY if it's actually solved AND it contains correct numbers in the grey cells. The scoring: 1 solved puzzle - 47 points, 2 solved puzzles - 97 points, 3 solved puzzles - 157, 4 solved puzzles - 227, 5 solved puzzles - 307, 6 solved puzzles - 397, 7 solved puzzles - 497. Time bonus - 7 point for every saved 30 seconds. All 7 puzzles must be solved to claim this bonus.

Each pair of connected grey cells must contain the same number!

1. Arrows

3	4	2	5	6	4	4
2	3	1	2	7	3	3
3	3	1	4	3	4	5
2	3	2	1	3	1	
2	5	1	2	3	1	1
5	4	3	4	4	1	2
2		3	4	4	1	3

2. Different neighbours

3		3	1			3
					2	
						1

3. Battleships

Clues (right): 4, 5, 5, 5
Clues (bottom): 4, 4, 3

4. Fences

				1	
2					
1		0			2
			2		0
	2		2		
0		1		1	
	1	2			0

5. Minesweeper

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

6. Skyscrapers

Left clues: 5, 2, 1, 2, 3, 5
Right clues: 2, 3, 2, 6, 2, 3
Bottom clues: 5, 4

7. Sudoku

	6			1	
		3		4	
			3		
7					
	5		6		

Each pair of connected grey cells must contain the same number!

Author - Olga Leontieva

10th Russian
Puzzle Championship
Part I
Mixture
(120 minutes)

1. Find the twins (20 + 20 points)

Find two identical shapes.
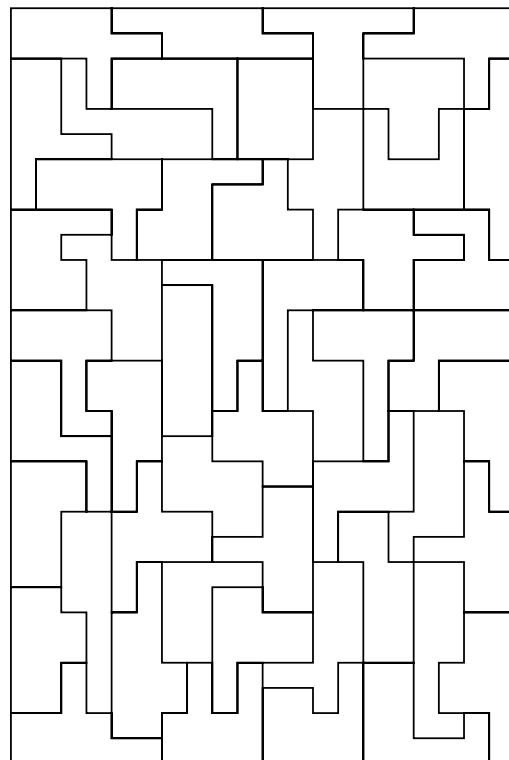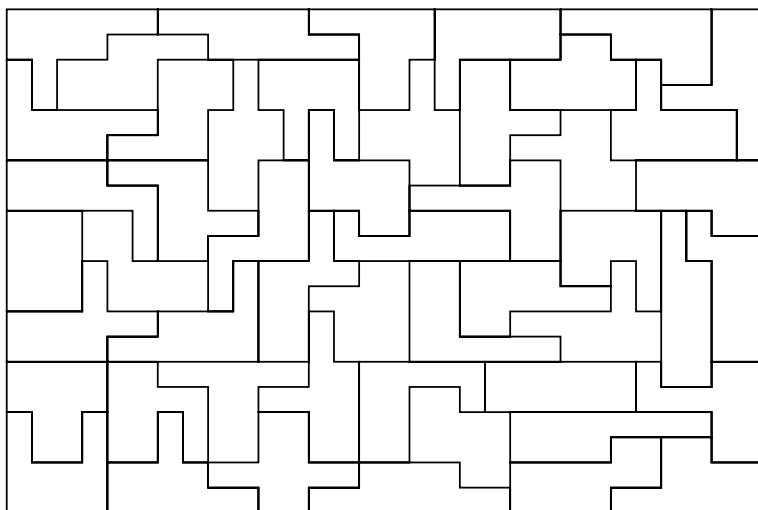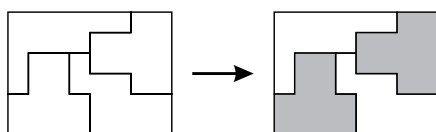
2. Scrabble (30 points)

Make the crossword using all the given Russian words. All letters Ч and Р (first letters for "Russian Championship" in Russian) are already placed.
Note that Ы is the single letter.

| АКР | | АРАТ | | АРБА | | ЧАЧА |

| АПАЧИ | КУМИР | УРА |
БАРЫГА	КУЧКА	ЧАВЫЧА
ВОРОТА	ЛИНКОР	ЧАДРА
ГОНЧАР	РАЗУМ	ЧАРА
ДАЧА	РВАЧ	ЧАСИКИ
ДРОГИ	РЕЗКА	ЧЕКАНКА
ЕВРОПИЙ	РЫБЫ	ЧУРЕК
ЖАНР	РЫК	
ЖАР	ТРЮКАЧ	

3. Triples (25 + 30 points)

Place the numbers 1 through 10 (each number twice) so that all three identical numbers were the endpoints and the center of the segment.
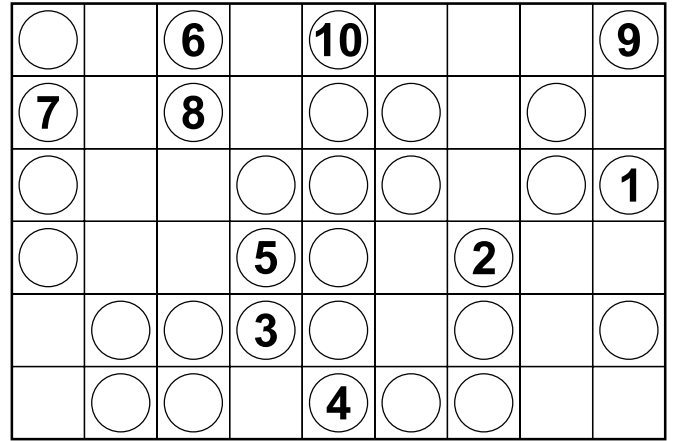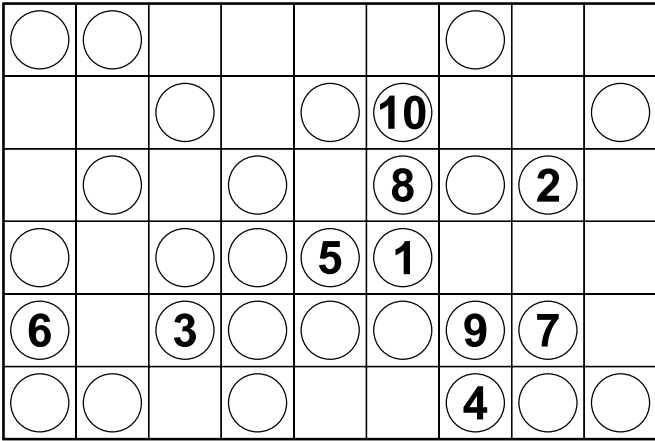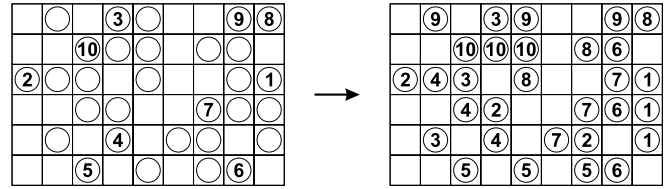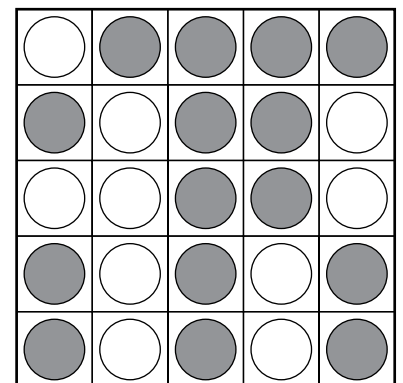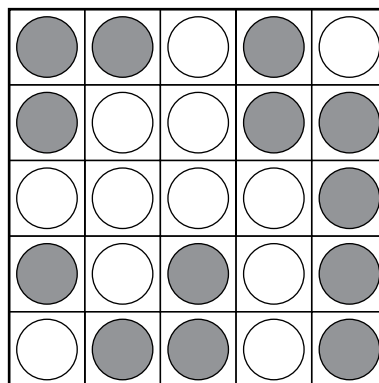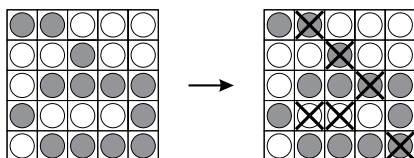
4. Linequality (15 + 15 points)

Place in the cells the digits 1 through 9 (each once) so that equality and both inequalities were correct.
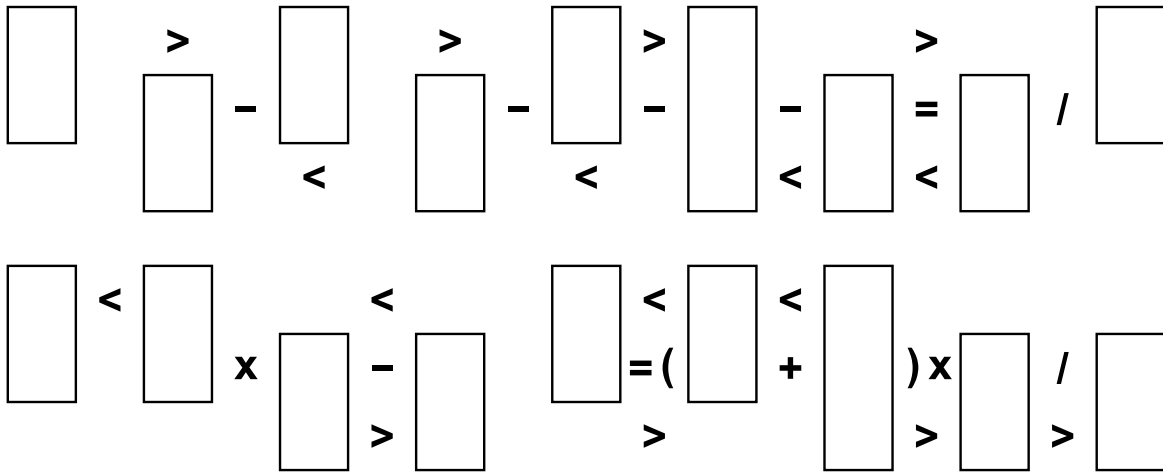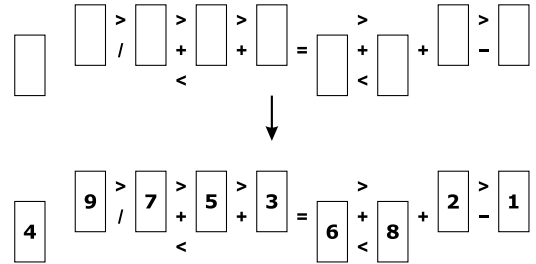
5. Buttons (30 + 30 points)

The buttons can be only black or white. Pressing the button causes change of the color for the button itself and all adjacent buttons. Press exactly SIX buttons so that all the buttons became white.

6. Chaos (20 + 60 points)

Fill the grid with the numbers 1 through 4. There cannot be three consecutive identical numbers in any direction. Also there cannot be identical numbers connected by the move of the chess knight.

4	1	1	3	3
	2			4
3	2			
3			1	

→

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

First grid:

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

Second grid:

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

7. Triangles (20 + 40 points)

Place in the grid some half cell triangles, not touching each other even diagonally. Numbers outside the grid indicate the number of hypotenuses of both orientations.

Example:

3 0
1 0
1 1
0 2

2 1 1 1
1 0 0 2

→

3 0
1 0
1 1
0 2

2 1 1 1
1 0 0 2

First puzzle grid:

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

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

Second puzzle grid:

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

5 1 1 3 1 2 1
0 0 2 0 2 0 3

8. Mastermind in line (20 + 20 points)

Place in the cells the digits 1 through 9 (each once). The results of four standard Mastermind comparisons are given: black dots indicate the number of the digits staying at the right place, white dots indicate the number of digits presented but staying at the different positions.

3	9	0	4	1	7	2	5
●	●	●		○	○		

4	8	6	2	1	0	8	9
●	○			●	●	●	

↓

3	9	7	4	6	5	1	0	8	2

Puzzle 1:

7	4	2	1	6	9	4	2
●	●			●	●	○	

8	0	5	3	1	8	6	5
○	○			●	●	○	

Puzzle 2:

6	8	9	5	1	8	3	9
●	●	○		●	●		

| 7	2	4	0	7	4	9	6
●	○			●	●	○	

9. Jumping (20 + 20 points)

Jumping consequtively at 1-2-3-1-2-3-and-so-on cells horizontally or vertically visit each cell exactly once and number visited cells in order. The first and the last cells of the path are given.
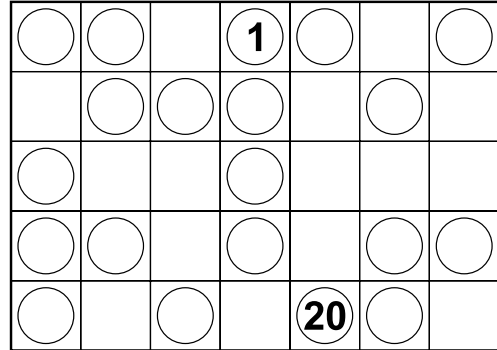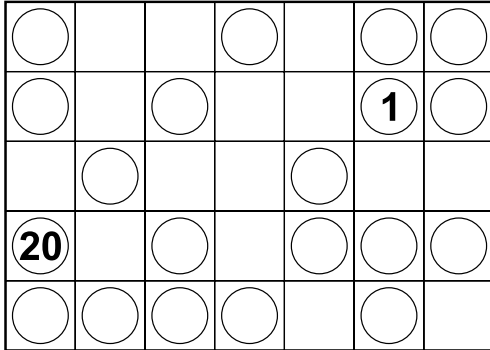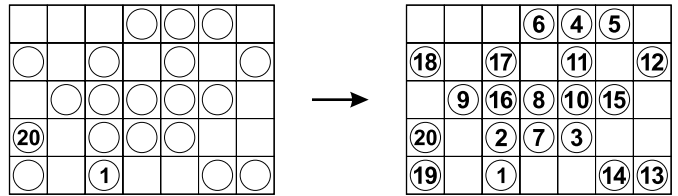
10. Domino sums (20 points)

Place all the given domino elements to make the correct domino chain. Numbers inside the loop show the sum of all neighbouring half-domino values.
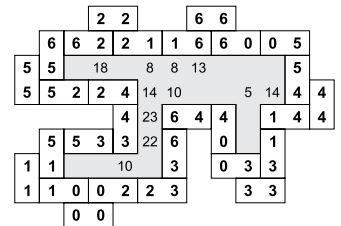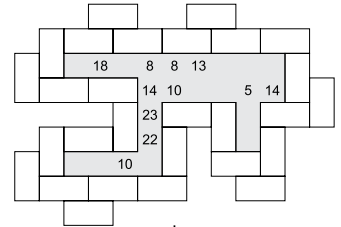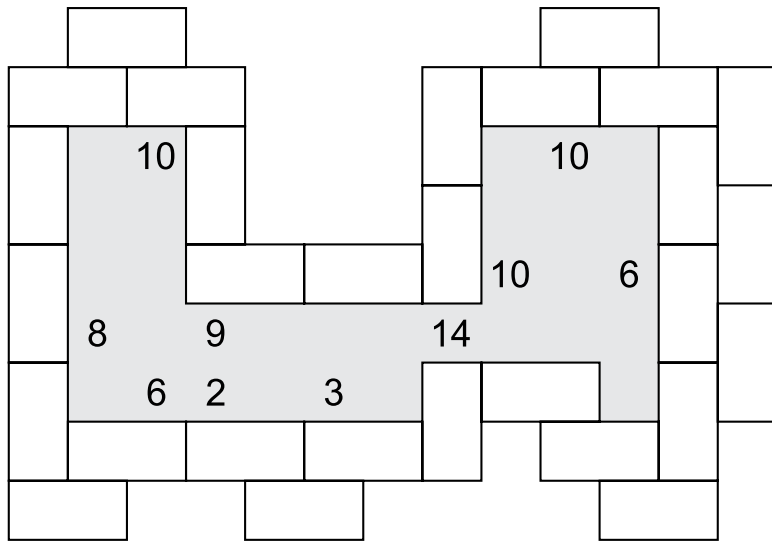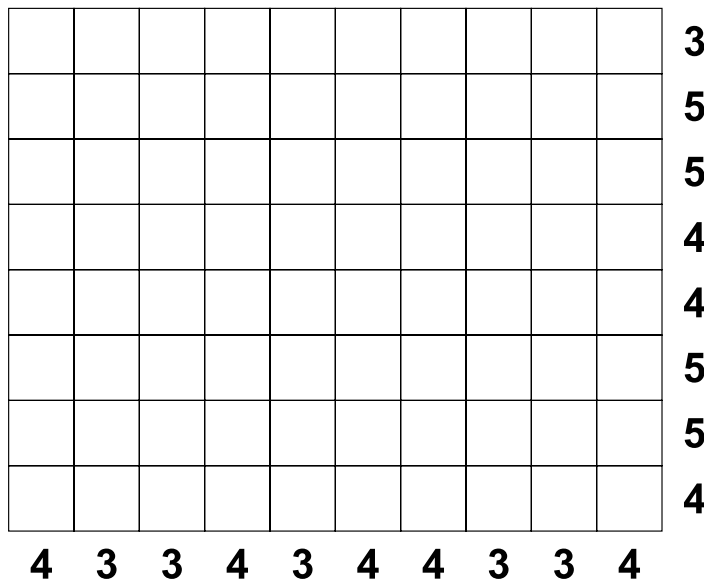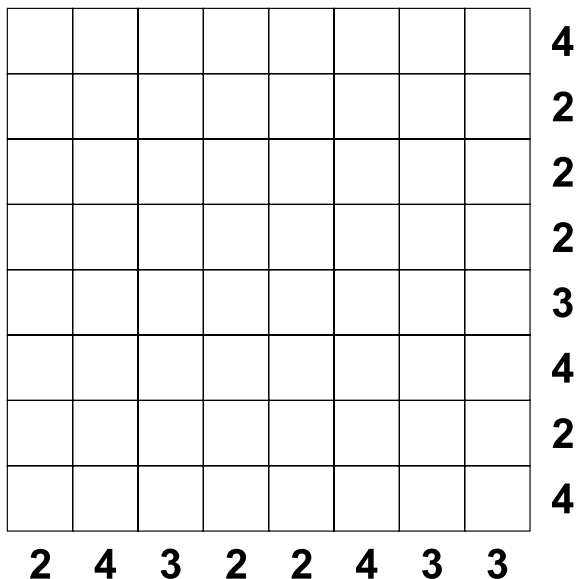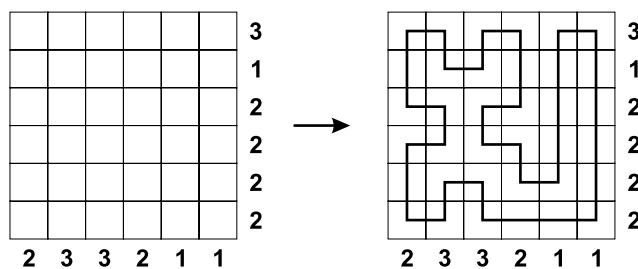

11. Pintamino (20 points)

Each pentamino element has two pinholes. There are 6 pins that are already placed in the grid. Add another 6 pins and put on them all 12 pentaminoes. Each pentamino must be put on one originally placed pin and one added pin. Each pin must hold exactly two pentaminoes. Elements cannot overlap anywhere except the pinholes and must fill all the grid.
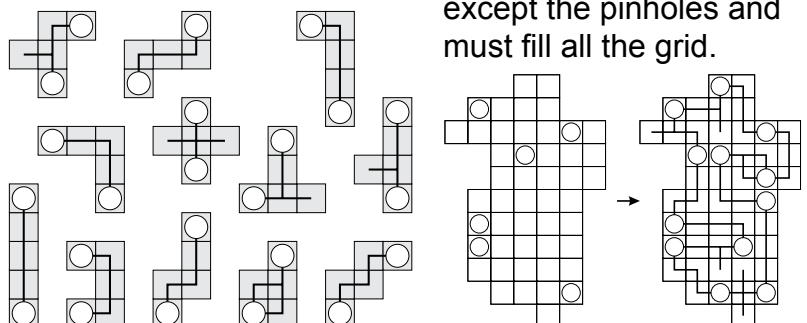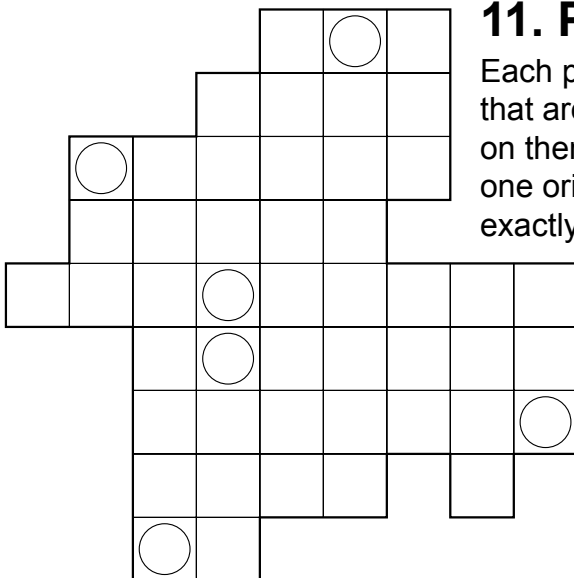
12. The loop (10 + 15 points)

Draw the closed single loop, not touching or crossing itself, going through all the cells of the grid. Numbers outside the grid indicate the number of straight segments of the loop placed in the corresponding rows and columns.

Example grids with row hints 3, 1, 2, 2, 2, 2 and column hints 2, 3, 3, 2, 1, 1.

Left grid (8×8) — row hints (top to bottom): 4, 2, 2, 2, 3, 4, 2, 4; column hints (left to right): 2, 4, 3, 2, 2, 4, 3, 3.

Right grid (10×8) — row hints (top to bottom): 3, 5, 5, 4, 4, 5, 5, 4; column hints (left to right): 4, 3, 3, 4, 3, 4, 4, 3, 3, 4.

Part II

Expressions

(30 minutes)

*In this part you should construct as many as possible expressions with the results 1, 2, 3 and so on, using the numbers 2, 4, 8, 13, 19, each once, signs "+" (plus), - (minus), * (times), / (divide) and parenthesis as many times as needed. There's an important rule: you cannot miss any result! Scoring: (the minimal result that you couldn't achieve) x 2. You don't have to stop where these rows end!*

1=(19-13)/(8+2-4)   15=_____   29=_____   43=_____   57=_____

2=_____   16=_____   30=_____   44=_____   58=_____

3=_____   17=_____   31=_____   45=_____   59=_____

4=_____   18=_____   32=_____   46=_____   60=_____

5=_____   19=_____   33=_____   47=_____   61=_____

6=_____   20=_____   34=_____   48=_____   62=_____

7=_____   21=_____   35=_____   49=_____   63=_____

8=_____   22=_____   36=_____   50=_____   64=_____

9=_____   23=_____   37=_____   51=_____   65=_____

10=_____   24=_____   38=_____   52=_____   66=_____

11=_____   25=_____   39=_____   53=_____   67=_____

12=_____   26=_____   40=_____   54=_____   68=_____

13=_____   27=_____   41=_____   55=_____   69=_____

14=_____   28=_____   42=_____   56=_____   70=_____

Part III

Hexiom

(30 minutes)
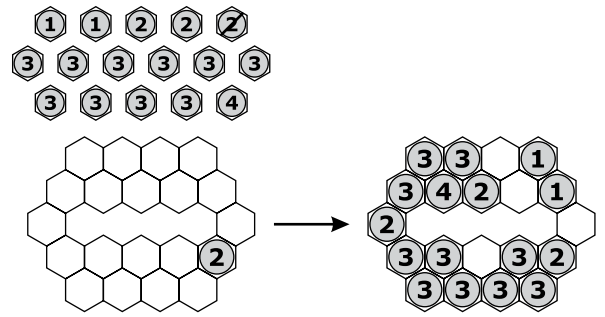
Place in the grid all given grey numbered honeycombs. Each number should indicate the quantity of the grey honeycombs around. Scoring: 15 points for each solved puzzle.