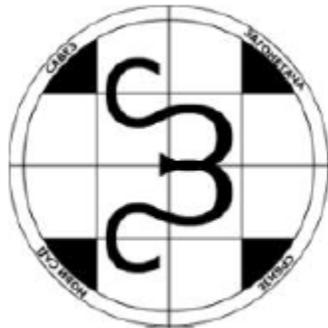


1st OPEN SERBIAN OPTIMIZING PUZZLE CHAMPIONSHIP

24. NOVEMBER - 7. DECEMBER 2008.

<http://puzzleserbia.com/>



2nd WEEK

MONDAY, 1.12. - SUNDAY, 7.12.

8. FOUR IN A ROW AROUND SERBIA

9. SUDOKU PALINDROME

10. DOMINO 7

11. MAGIC PENTA BATTLESHIPS

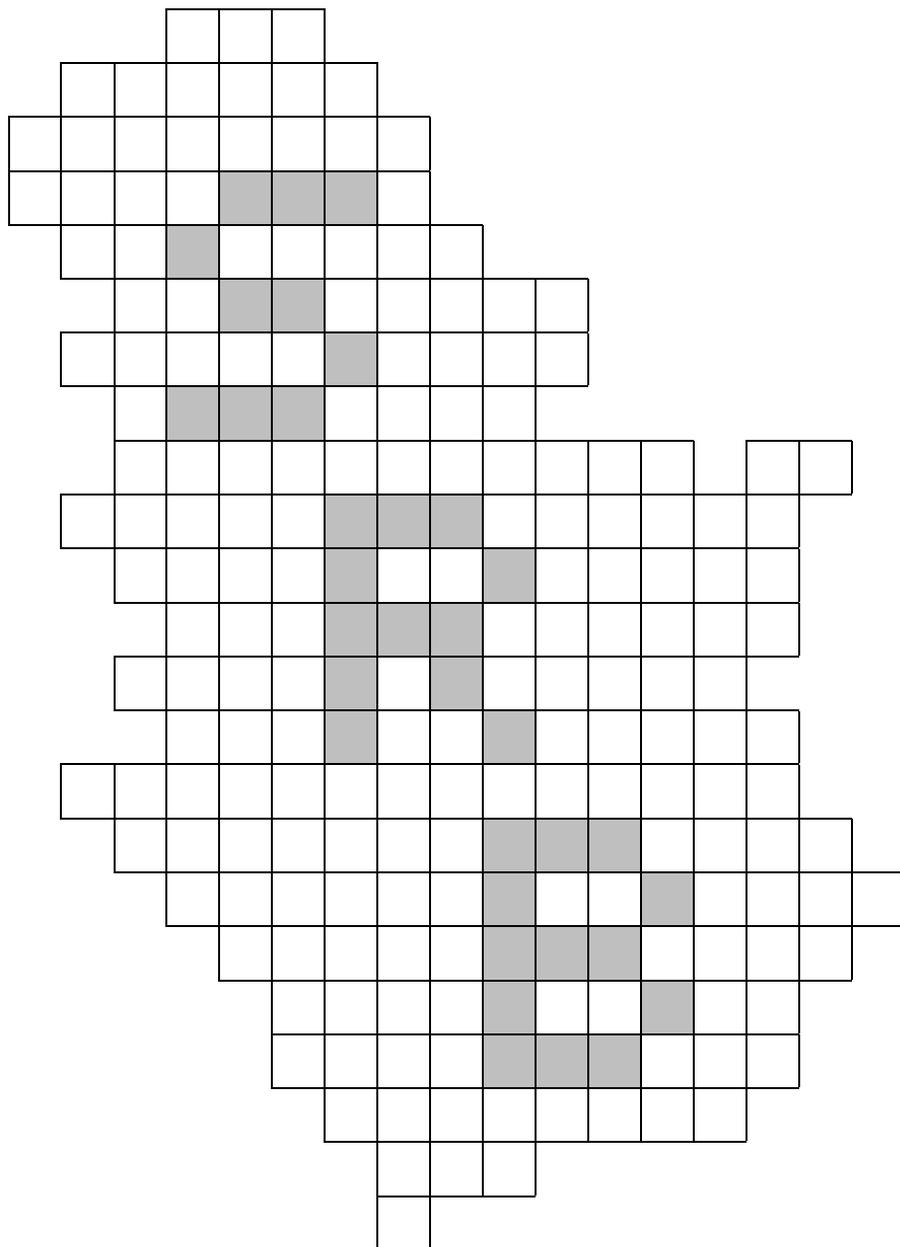
12. CHESS POSITIONS

13. FOUR EQUATIONS

14. ABCD FALLING BALLS

Puzzle 8 **FOUR IN A ROW AROUND SERBIA**

Place in the grid 111 letters "X" and 111 letters "O". More than four identical letters in line (horizontally, vertically or diagonally) cannot appear anywhere in the grid. No 3x3 square can contain all 9 letters of one kind. A sequence of four identical letters (horizontally, vertically or diagonally) is worth one point. A sequence of four identical letters that passes through at least one coloured square is worth two points. Maximize your result.



example:

		X	X	X	X	O	
			O	X	X	O	O
	X	X	O	O	X	O	X
	O	X	O	O	O		
X	X	X	X	O	X	O	X
	X	O	X	X	O	O	X
	X	O	O	X	O	O	X
X	X	O	O	O			X
X	O	O	O	O			
	O	X	O				

Answer format: Write your result, followed by the content of the grid, left to right, top to bottom. For the given example, the answer would be: 19; XXXXO, OXXOO, XXOOXOX, OXOOO, XXXXOXOX, XXXXOOX, XXXXOOX, XXXXOOX, XXXXOOX, XOOOO, XOOOO, OXO.

Puzzle 9

SUDOKU PALINDROME

Fill in the grid so that every row, column and 3x3 box contains all different digits from 1 to 9. All squares must be filled. Draw a palindromic path that goes only horizontally and vertically, and cannot cross or overlap itself. The sequence of numbers on the path must be identical in both directions. Maximize the length of the path.

									1
									2
									3
									4
									5
									6
									7
									8
									9
A	B	C	D	E	F	G	H	I	

example:

4	2	6	1	5	3	1
3	5	1	2	4	6	2
6	4	2	3	1	5	3
5	1	3	4	6	2	4
2	6	4	5	3	1	5
1	3	5	6	2	4	6
A	B	C	D	E	F	

Answer format: Write the length of the path, followed by the content of the grid, left to right, top to bottom, followed by the coordinates of: starting square, all turns in order of visiting and ending square. For the given example, the answer would be: 25; 426153, 351246, 642315, 513462, 264531, 135254; C6, A6, A2, B2, B5, C5, C4, E4, E1, F1, F5, D5.

Puzzle 10

DOMINO 7

Place full set of dominoes 1-6 (1-1 to 6-6) in a 7x6 grid. Find in the grid pairs of horizontally or vertically neighbouring numbers whose sum is equal to 7. Maximize the number of these pairs.

example:

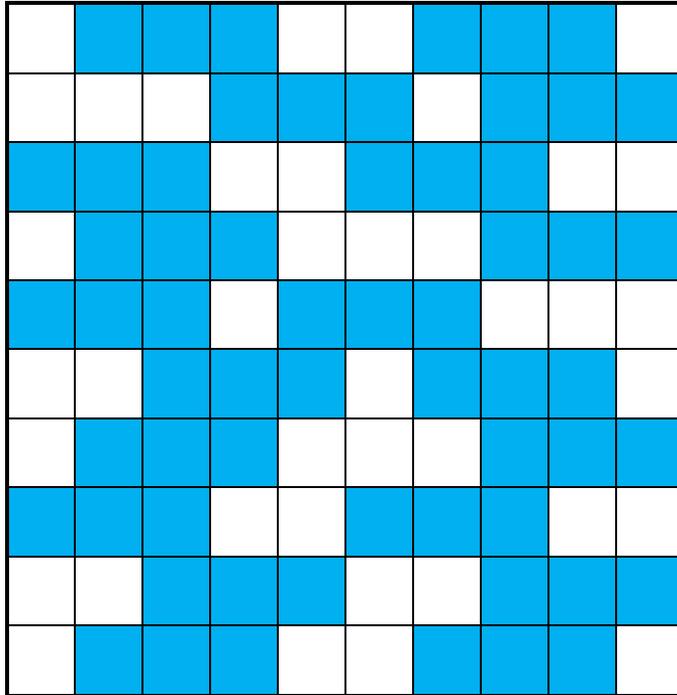
1	1	1	2	1	3
1	4	1	5	1	6
2	2	2	3	2	4
2	5	2	6	3	3
3	4	3	5	3	6
4	4	4	5	4	6
5	5	5	6	6	6

Answer format: Write the number of pairs, followed by the content of the grid, left to right, top to bottom. Put the horizontal dominoes in the bracket. For the given example, the answer would be: 11; (11)(12)(13), (14)(15)(16), (22)(23)(24), (25)(26)(33), (34)(35)(36), (44)(45)(46), (55)(56)(66).

Puzzle 11

MAGIC PENTA BATTLESHIPS

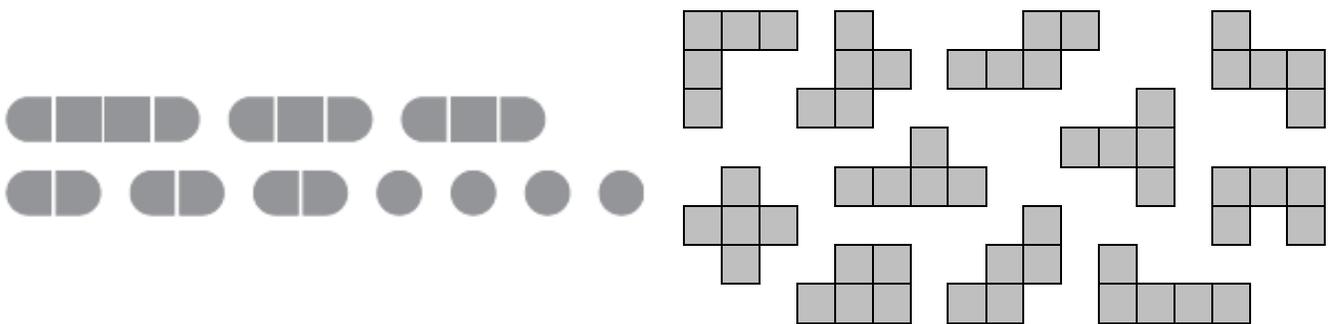
Place in the grid complete set of battleships and four different pentominoes (choose from given 11 pentominoes). The ships and pentominoes must occupy exactly four squares in each row and column. The ships cannot touch each other, not even diagonally. Also, the pentominoes cannot touch each other, not even diagonally. However, the ships and the pentominoes can touch each other. Pentominoes can be rotated and/or reflected. Fill in the remaining squares the numbers from 1 to 6 so that no number appears more than once in a row or a column. In 20 horizontal blue triplets you will get one-digit, two-digit, or three-digit numbers. Maximize the sum of these numbers.



example:

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

$$613+652+352+41+162+6+123+513+6+4 + 213+52+3+456+2+253=3451$$



Answer format: Write the sum, followed by the content of the grid, left to right, top to bottom. Use "B" for battleships and "P" for pentominoes. For the given example, the answer would be: 3451; B61325BBB4, B43PPP1652, 352PBP416B, 416253BPPB, 6BBB1234P5, 2P51346BPP, PPP4B65213, 52P6BPP341, 13456PPP2B, BBBB412536.

Puzzle 12

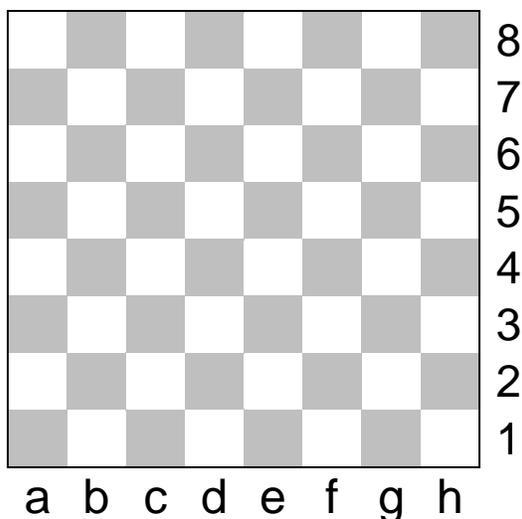
CHESS POSITIONS

Place on the chessboard all 16 white pieces: one king (K), one queen (Q), two rooks (R), two bishops (B) (on squares of the opposite colours), two knights (N) and eight pawns (p) so that in each row and column appear exactly two pieces. Pawns cannot be placed on the first and the eighth row. Construct the position so that:

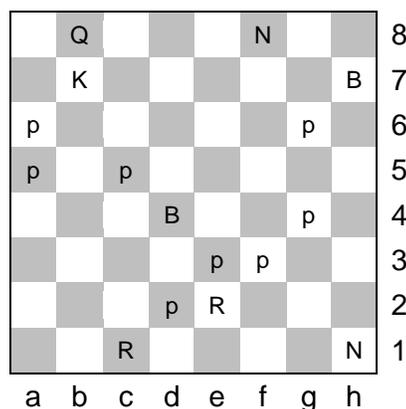
- (a) white can make as many moves as possible (M)
- (b) white can make as little moves as possible (L)

Maximize the difference M-L.

Note: If the pawn is on the square a7 and a8 is empty, white can play four moves: pa8Q, pa8R, pa8B, and pa8N. If the pawn is on the square a2, and a3 and a4 are empty, white can play two moves: pa3 and pa4.



example:



Answer format: Write your result, followed by the coordinates of each piece for part (a), followed by the coordinates of each piece for part (b). For the given example, the answer would be: (a) 51; Kb7, Qb8, Rc1, Re2, Bd4, Bh7, Nf8, Nh1, pa5, a6, c5, d2, e3, f3, g4, g6. (b) ...

Puzzle 13

FOUR EQUATIONS

Place the numbers from 1 to 9 in all four expressions. Each number can be used only once in each expression. Results of expressions must be integers. Minimize the difference between the greatest and the smallest result.

$$\boxed{}\boxed{}\boxed{}\boxed{}\boxed{} - \boxed{}\boxed{}\boxed{}\boxed{} =$$

$$\boxed{}\boxed{} \times \boxed{}\boxed{} + \boxed{}\boxed{}\boxed{}\boxed{} - \boxed{} =$$

$$\boxed{}\boxed{} \times (\boxed{}\boxed{}\boxed{} - \boxed{}\boxed{}) + \boxed{}\boxed{} =$$

$$\boxed{}\boxed{}\boxed{} \times (\boxed{}\boxed{} + \boxed{}\boxed{} + \boxed{}) : \boxed{} =$$

example (1-5):

$$\boxed{1}\boxed{5}\boxed{4} : \boxed{2} - \boxed{3} = 80$$

$$\boxed{4} \times \boxed{2}\boxed{1} - \boxed{5} - \boxed{3} = 76$$

$$\boxed{5} \times \boxed{4} \times \boxed{3} + \boxed{2}\boxed{1} = 81$$

$$\boxed{2} \times (\boxed{5}\boxed{3} - \boxed{1}\boxed{4}) = 78$$

81-76=5

Answer format: Write your result, followed by the sequence of numbers in each expression. For the given example, the answer would be: 5; 15423, 42153, 54321, 53142.

Puzzle 14

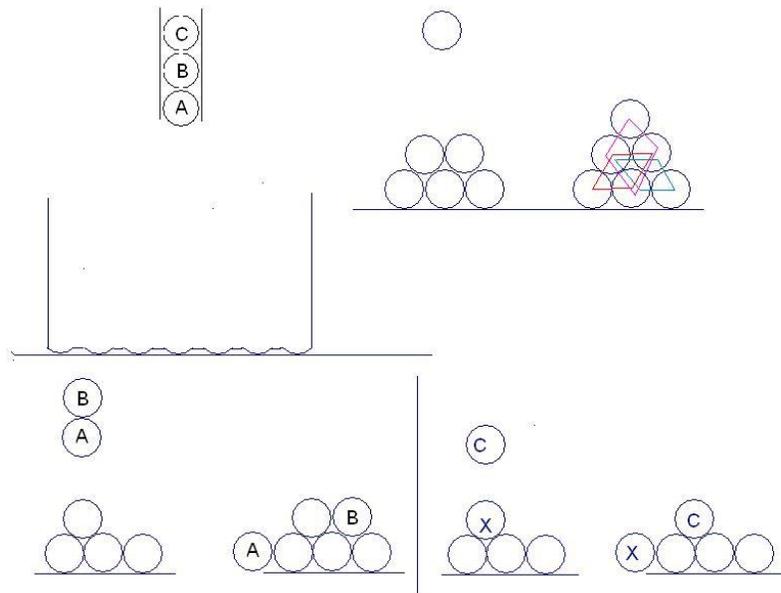
ABCD FALLING BALLS

Small balls marked with letters A, B, C or D are falling through a vertical pipe into a glass box, one by one. The first ball drops and stays at the bottom right below the pipe. The succeeding balls drop according to the following rules:

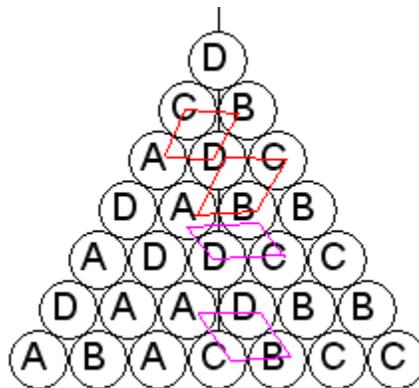
- 1) If a ball falls between two balls, it stays there.
- 2) If a ball falls on another ball not directly on the top of it, but on one side, it rolls down to that side.
- 3) If a ball falls directly on the top of another ball (X in the example) then:
 - 3.1) ball A rolls to the left.
 - 3.2) ball B rolls to the right.
 - 3.3) ball C pushes X to the left and takes its place, if possible. If not, than ball C rolls to the left.
 - 3.4) ball D pushes X to the right and takes its place, if possible. If not, than ball D rolls to the right.

The bottom of the box is long enough, so that the balls can roll freely in both directions. Any construction made of these balls is stable, it will not slide or collapse under the pressure of dropping balls.

You have 28 balls (7 of each letter - A, B, C or D). Choose the order in which the balls fall through the pipe. Maximize the number of 2x2 rhombs which have all four different letters.



example:



Answer format: Write the number of rhombs, followed by the order in which the balls fall. For the given example, the answer would be: 4; ABCDABCDABCDABCDABCDABCD.