WPC 2009
INSTRUCTION BOOKLET

18th
WORLD
PUZZLE
Championship
Antalya 2009
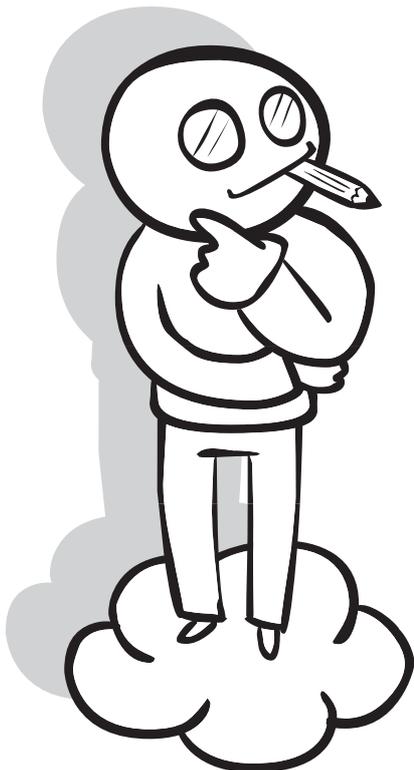
3-8 November 2009, Antalya - TURKEY

Version 1.0.

Schedule

01 November 2009 Sunday
19:00 - 23.00   WPC Pre-Party in Istanbul – Prokopi Restaurant

03 November 2009 Tuesday
All Day   Arrivals
20:00 - 23.00   Welcome Party

04 November 2009 Wednesday
07:00 - 09:30   Breakfast
10:00 - 19:00   Excursion with photo session
19:00 - 20:30   Dinner
21:00 - 22:00   Technical Meeting

05 November 2009 Thursday
07:00 - 09:30   Breakfast
09:30 - 12:55   Competition and WPF Congress
12:55 - 14:15   Lunch
14:15 - 18:00   Competition and WPF Congress
19:00 - 20:30   Dinner
21:00 - 22:30   Antalya Karala Cup

06 November 2009 Friday
07:00 - 09:30   Breakfast
09:30 - 12:30   Competition and WPF Congress
12:30 - 14:00   Lunch
14:00 - 16:45   Competition and WPF Congress
16:45 - 17:10   Coffee Break
17:10 - 18:30   Competition and WPF Congress
19:00 - 20:30   Dinner
20:30 - 22:00   Antalya Sudoku Cup
22.15 - 23:00   Technical meeting for the finalists

07 November 2009 Saturday
07:00 - 09:30   Breakfast
10:00 - 12:00   Team Finals
12:00 - 13:00   Lunch
13:00 - 15:00   Individual Finals
15:30 - 16:30   Press conference
19:00 - 23:00   Awarding Ceremony

08 November 2009 Sunday
07:00 - 09:30   Breakfast
All Day   Departures

BONUS RULES:

A)Time Bonus: Except for parts 1, 4, 6 and 9, competitors/teams who correctly solve all the puzzles in any part before the allocated time will be eligible to receive time bonuses. The time bonuses will be 3 points per full minutes saved for individuals and 10 points per full minutes saved for teams.

B)Order Bonus: In parts 7, 10, 11, 13 and 15, the first eight individuals who correctly solve all the puzzles in the part will receive 20, 16, 13, 10, 8, 6, 4, 2 points respectively. In parts 12 and 16, the first five teams who correctly solve all the puzzles in the part will receive 70, 50, 35, 20, 10 points respectively. In Part 8 (The Weakest Link), the first five teams who correctly solve at least 15 puzzles out of 16, as well as the team puzzle, will receive 70, 50, 35, 20, 10 points respectively.

C)Welcome Part Bonus: In Part 1 (Welcome), the best five solutions shall receive 30, 24, 19, 14, 10 points respectively. If two or more teams reach the same result subject to bonus, they will receive the same bonus amount, and the next available bonus will remain unchanged.

RANKING:

Individuals: The individual scores shall be calculated as the total of all points obtained by the individuals from all the individual championship parts in days 1 and 2. **The top 12 individual competitors after Day 2 will compete in the individual playoffs in Day 3.**

Teams: The team scores shall be calculated as the the total of all points obtained by the teams from all the team championship parts in days 1 and 2 PLUS the total of the individual scores of the four competitors in the team. **The top 4 teams after Day 2 will compete in the team playoffs in Day 3.**

The instructions for the individual and team playoffs will be discussed in the technical meeting at the end of Day 2.

TIE BREAKING RULES:

Individuals: At the end of Day 2, if two or more individuals are tied in terms of total points obtained (including all bonuses), the criteria to determine the higher placed competitor will be, in order:

- points received (including all bonuses) from Part 14 (Best of OAPC),
- points received (including all bonuses) from Part 3 (Classics),
- points received (including all bonuses) from Part 5 (Innovative),
- points received (including all bonuses) from Part 11 (Matchmaker).

Teams: At the end of Day 2, if two or more teams are tied in terms of total points obtained (including all bonuses), the criteria to determine the higher placed team will be, in order:

- total points received (including all bonuses) from the team parts,
- the team with the lower total of placement positions of its members in the individual standings,
- the team whose lowest ranked competitor is placed higher.

*The points displayed on this instruction booklet may be subject to change.
* Except where distinctly stated, there won't be any partial points awarded for incomplete solutions.

Snake In The Woods

Use the given pieces to form the longest snake that doesn't touch itself, not even diagonally. Pieces may be folded along the given lines. The snake's width should be one unit square long, except at the turning points. Any point on the grid can be shared by at most 3 snake parts. Red squares can not be occupied by the snake.

Point: Length of the snake x 4 points

In case a team forms a snake that touches itself, the longer of the parts from head or tail to the first touching point will be considered as the length of the snake.
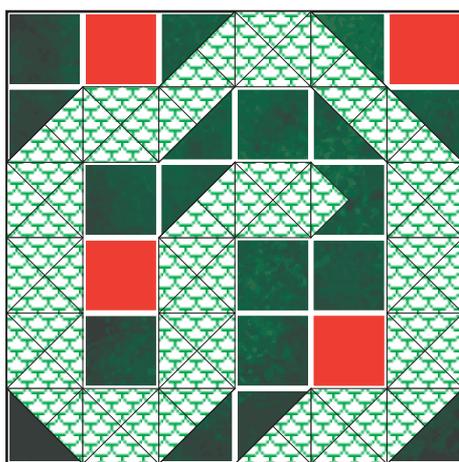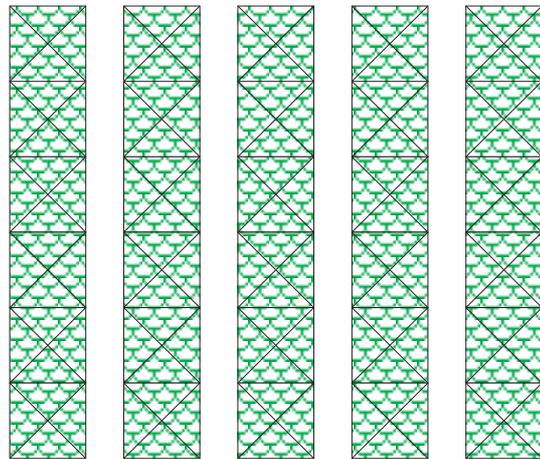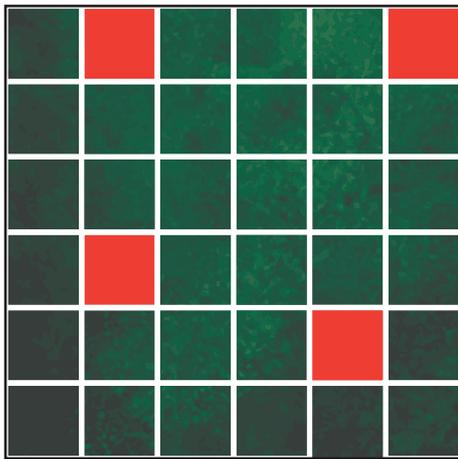
Snake with 25 unit length, 100 points
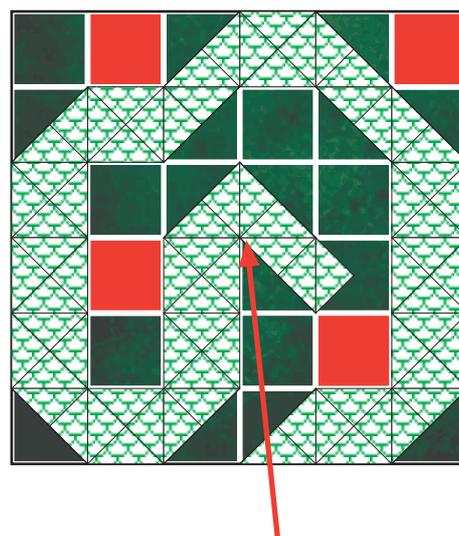
Snake touching itself
Marked point is touched by 4 snake parts.

24x4= 96 points

Part 2: Sprint - Individuals
November 5th, Thursday 10:10 - 10:30
20 Minutes - 100 Points

* There is a 5-point penalty for incorrect answer to puzzle 9.

The individual score in this part will depend on the number of correctly solved puzzles. The scores based on the number of solved puzzles are 3, 6, 10, 14, 19, 24, 30, 36, 43, 50, 57, 65, 73, 81, 90 and 100 points respectively.

1. ABC Connection

Connect the same letters using only horizontal and vertical lines. Lines should not cross each other and all cells should be used.
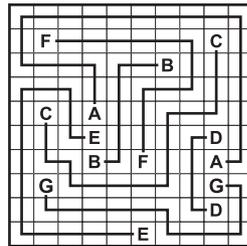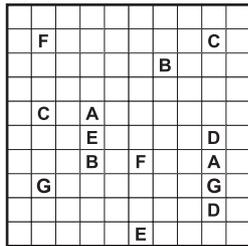
2. Clog The Shape

Place the minimum number of given pieces into the grid without overlapping each other and avoiding black cells so that no further pieces may be placed. Pieces may be rotated and/or mirrored.
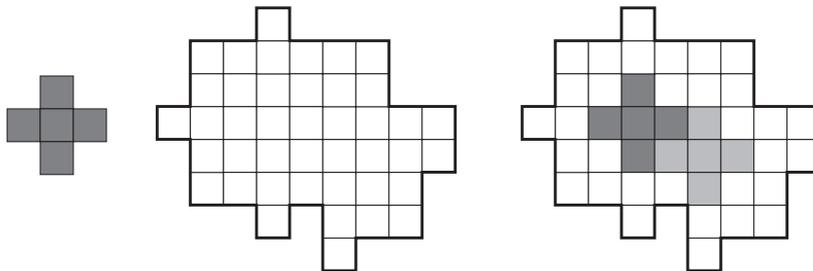
3. Digital Mess

Digits 1-5 (0-3 for the example) are located in the grid without overlapping each other. Find the position of all digits. Digits may be rotated but not mirrored. Show the positions of 3 and 4 in your answer.
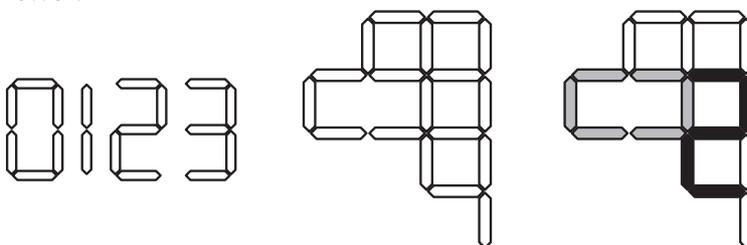
4. Pack Up

Place a letter into each cell so that the given expression can be read starting from a cell and moving along the lines in between cells.

KARE KARALAMA
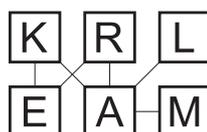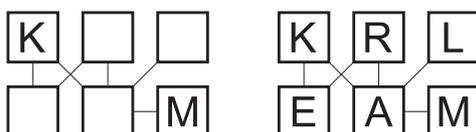
5.Windows

Blacken exactly two cells in each outlined 2x2 window to form one connected set of black cells which doesn't touch itself, not even diagonally. There cannot be a 2x2 square of four cells with the same colour (black or white) anywhere in the grid.
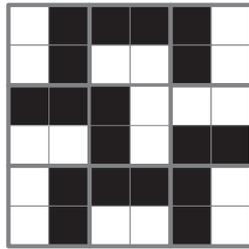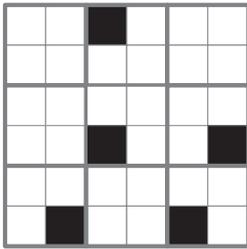
6.Offspring

Place a digit from 1 to 9 into each cell of the grid so that identical digits don't touch each other, not even diagonally. Every digit – except 1 – must have all the digits that are smaller than itself in its immediate neighborhood.
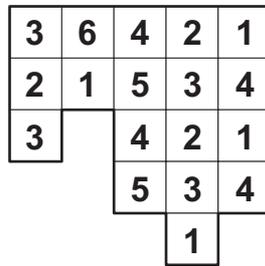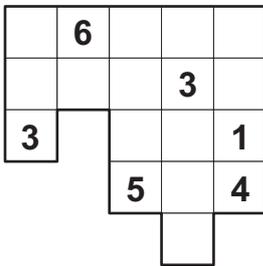
7.Yajilin

Paint some cells black so that every arrow points to exactly the corresponding number of black squares. Black squares cannot touch each other from the sides but they may touch diagonally, and all remaining white cells not occupied by an arrow or not blackened should be traversed by a single closed loop which connects the centers of adjacent squares and doesn't cross itself. Draw the loop and blacken all the necessary squares.
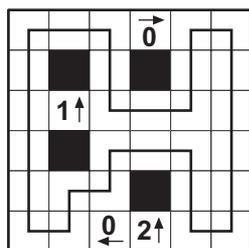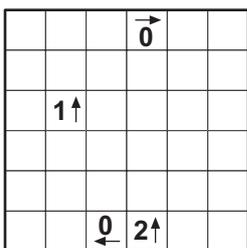
8.Rotational Sudoku

Place digits 1-6 in the diagram (1-9 for the example) and divide the grid along the given grid lines into some regions (1x1 and larger), where the given circles represent the point of symmetry. No digit is repeated within any row, column or region. Pairs of cells within the same region which are symmetrical with respect to the circle in the region should always contain consecutive digits. All regions should contain a circle and all circles are given.
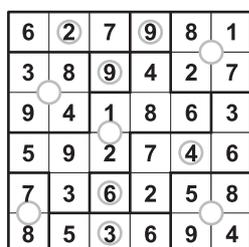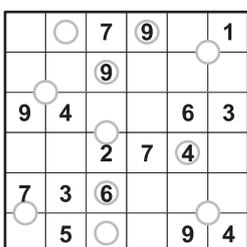
9.How Many Solutions?

How many different solutions can be found for the given Battleships Puzzle? Enter the given fleet into the diagram. The ships may not touch each other, not even diagonally. The numbers outside the grid indicate the number of ship segments in the corresponding row or column.

Incorrect answers will be penalized by a 5-point penalty. However, the total points of any individual will not be allowed to fall below zero in the sprint part; any negative totals will be converted into 'zero' points.
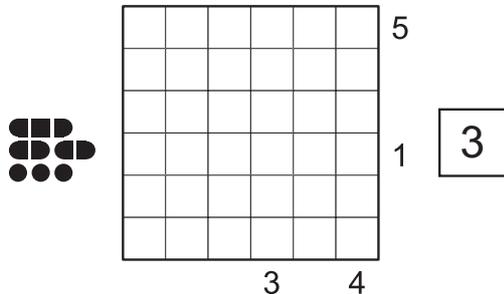
10.Puzzle

Read the word 'PUZZLE' (as shown) in the grid, starting anywhere and moving like the knight in a game of chess. The path can cross itself. Pay attention to the difference between two possible 'Z's, where the lower type 'Z' should be encountered before the higher type 'Z', and the word 'PUZZLE' should not contain two 'Z's of the same orientation. Show your path.
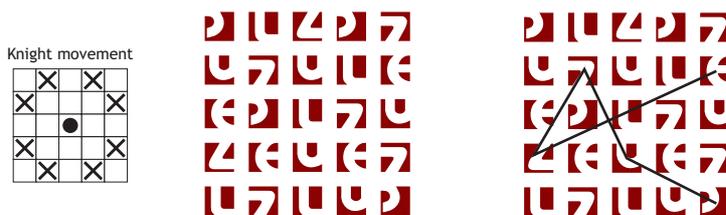
11.Fifty Fifty

Blacken some triangles so that each hexagon formed by six triangles contains exactly three blackened triangles.
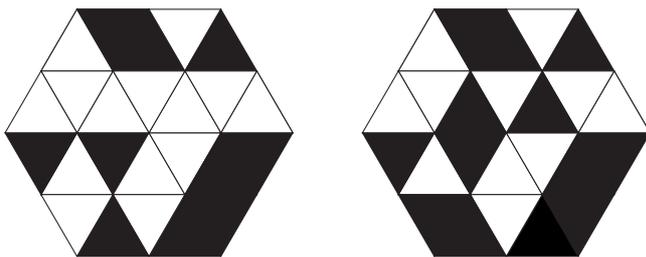
12.OpHoop

Cut the hoop on a given line and remove one cell so that there will be a correct arithmetic equation beginning from the cut and reading counterclockwise. The equation cannot start with a sign and two signs cannot be adjacent. The usual priorities of arithmetic operations do not hold, and operations are performed in the order in which they are encountered. You may encounter fractions along your way, but the value on both sides must be a positive or negative integer.

27+3-23=4x5÷2-3
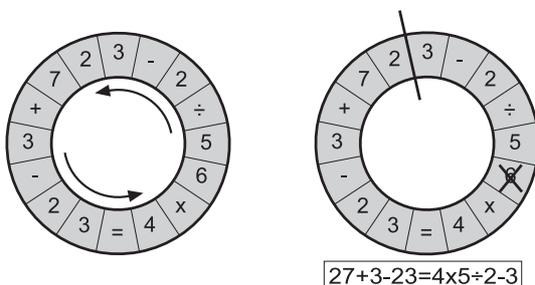
13.Foton

Connect some of the intersection points with straight lines of one unit length. Numbers in the grid indicate how many lines will be drawn from that intersection point. Shaded parts are walls, and lines cannot lie along the walls. When all the lines are drawn, all white areas of the grid should remain interconnected (in other words, no separate closed regions should be formed).
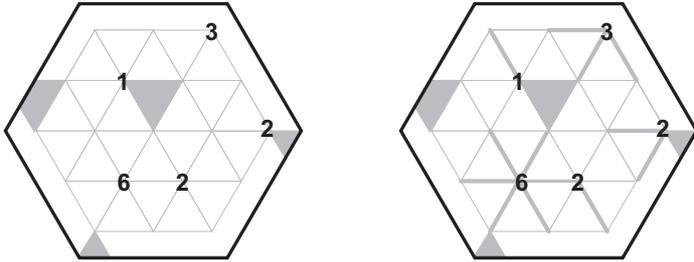
14.Gappy Skyscrapers

Fill the grid with digits 1-4 (1-3 for the example) so that each digit appears exactly once in each row and in each column. Each digit inside the grid represents a building with the height of the digit itself. Numbers outside the grid indicate the number of buildings that can be seen by an observer looking into the grid in the corresponding direction, taking into account that higher buildings block the view of lower buildings from the observer. Exactly one cell will remain empty in each row and in each column.
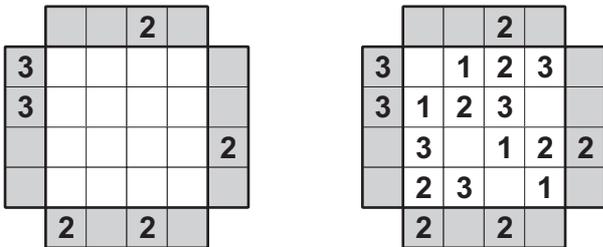
15.Retro Tetro

Locate the five given tetrominoes (three in the example) in the grid so that tetrominoes do not touch each other, not even at a point. Tetrominoes may be rotated and/or mirrored.
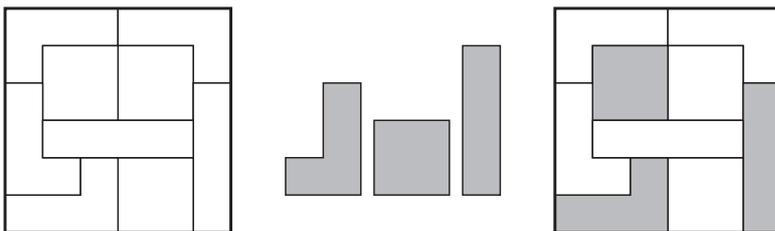
16.Hedef

Place a digit 1 to 6 in each layer of the four groups of six layers. Each group of six layers consists of three couples of layers symmetrical with respect to the center point of the figure and each layer within a group should contain exactly one of each digit 1 to 6. If a number inside a layer is greater than all of the numbers inside its neighbouring layers sharing sides, that area should be shaded; and all shaded layers are given. Neighbouring layers sharing sides cannot contain the same numbers. Identical (same size and shape) layers cannot contain the same numbers.
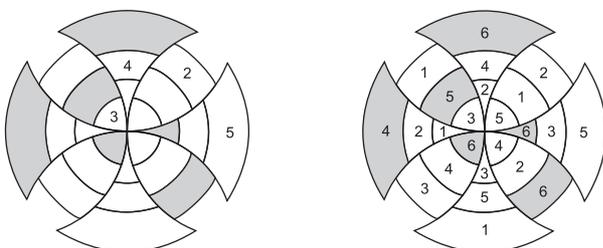
1. Easy As ABC (15+35 Points)

Place the letters given in parentheses into the grid so that each letter occurs exactly once in each row and in each column. The letters given outside the grid indicate the letters seen first in the corresponding direction.
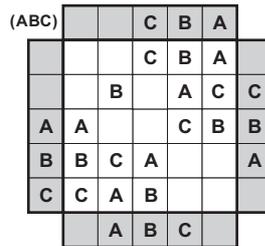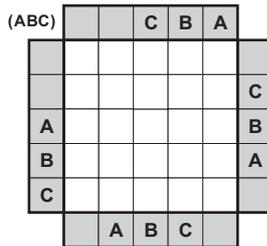
2. Star Battle (25 Points)

Place exactly two stars in each row, each column and each outlined area. Stars have the size of one cell and cannot touch each other, not even diagonally.
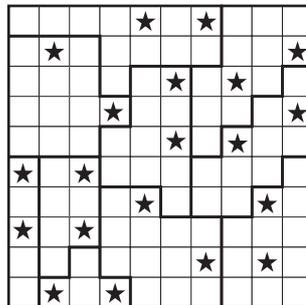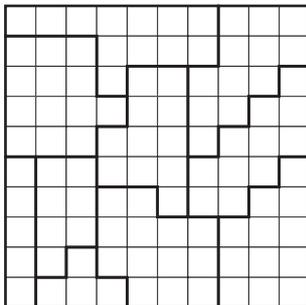
3. Equations (10+10 Points)

Place each of the numbers given in parentheses exactly once into the relevant spaces in the grid so that the equations in each row are correct. The usual priorities of arithmetic operations do not hold, and operations are evaluated from left to right.
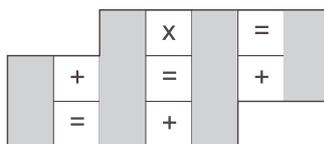
(2,3,5,6)
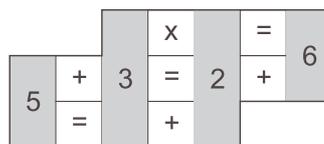
3x2=6
5+3=2+6
5=3+2

4. Ungerade Innenzahlen Rundweg (15 Points)

Draw a single continuous loop by connecting neighbouring dots horizontally or vertically. The numbers inside the grid indicate how many edges of a cell are used for the loop. <u>All odd numbers inside the loop are given.</u> The loop cannot touch or cross itself.
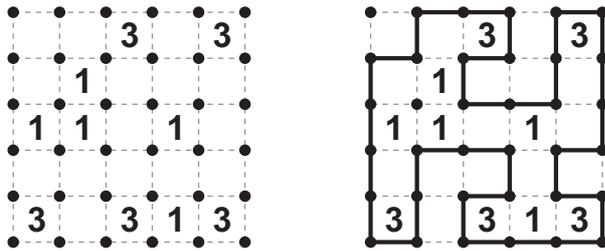
5. Clouds (15+35 Points)

Place some clouds into the grid. Clouds are in the shape of rectangles and squares, and at least two squares wide and two squares long. The clouds cannot touch each other, not even diagonally. The numbers outside the grid indicate the total number of cells covered by clouds in the corresponding direction.
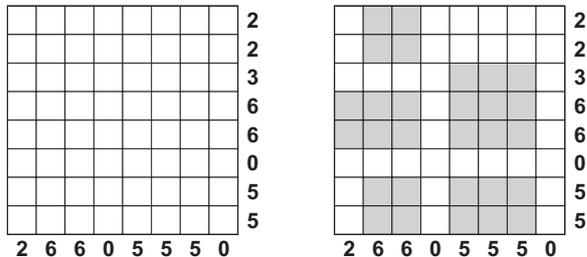
6. 2009 Domino Castle (20 Points)

Place the given set of dominoes into the 2009 figure using each domino exactly once. Half dominoes sharing an edge should contain the same numbers. Numbers outside the grid indicate all of the numbers that are used in the corresponding direction, without order.
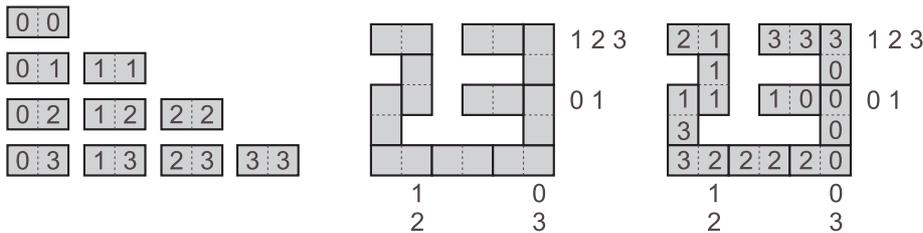
7. Four Winds (18 Points)

Draw one or more lines from each numbered cell so that each number indicates the total length of lines that are drawn from that cell, excluding the cell itself. Lines are either horizontal or vertical and connect the centers of adjacent cells without crossing or overlapping each other and the given numbers.
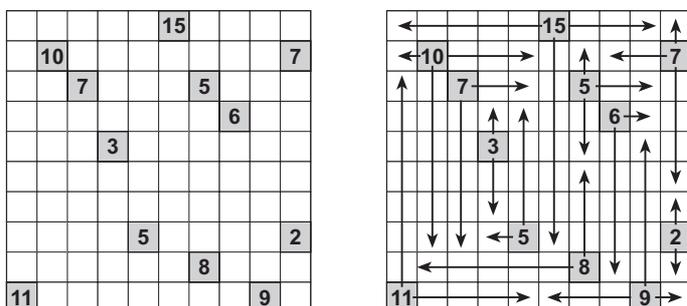
8.Skyscrapers (27+33 Points)

Fill in each cell of the grid with digits 1-6/1-7 as given (1-5 for the example), so that each digit appears exactly once in each row and in each column. Each digit inside the grid represents a building with the height of the digit itself. Numbers outside the grid indicate the number of buildings that can be seen by an observer looking into the grid in the corresponding direction, taking into account that higher buildings block the view of lower buildings from the observer.

			5		
					3
					3
4					
3					
	4	2			

			5		
	4	5	3	1	2	3
	5	4	1	2	3	3
4	1	2	4	3	5	
3	2	3	5	4	1	
	3	1	2	5	4	
		4	2			
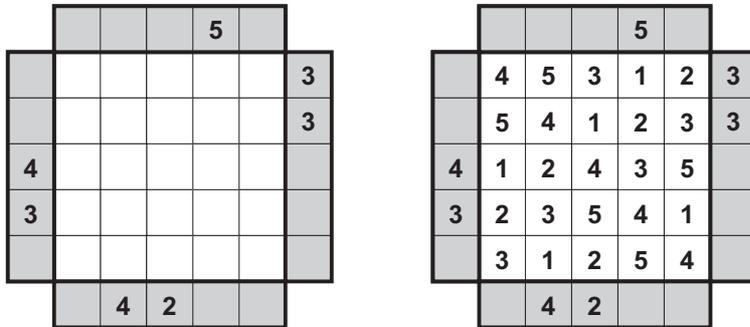
9.Kropki Sudoku (20 Points)

Fill the whole grid with digits 1 to 9 (1 to 6 in the example), so that each digit appears exactly once in each row, each column and each outlined box. All adjacent cells containing consecutive digits are separated by a white dot, and all adjacent cells where one digit is exactly half of the other in value are separated by a black dot. The dot between 1 and 2 may be black or white, and not necessarily consistent throughout the puzzle.

5	1	4	2	3	6
6	3	2	1	4	5
1	4	5	6	2	3
3	2	6	4	5	1
2	6	3	5	1	4
4	5	1	3	6	2
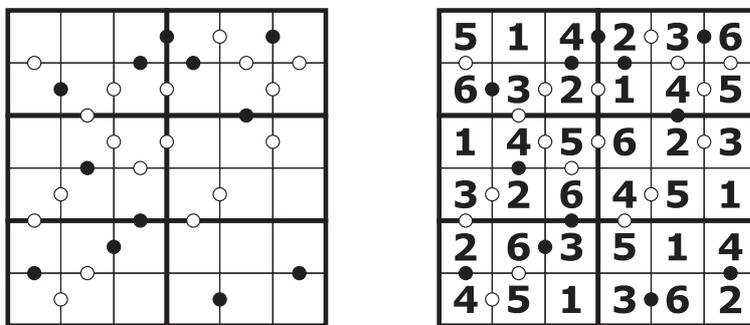
10.Hexa Fences (45 Points)

Draw a continuous loop in the grid, following the grid lines. Numbers in the grid indicate how many edges of that cell are used by the loop. The loop cannot touch or cross itself.
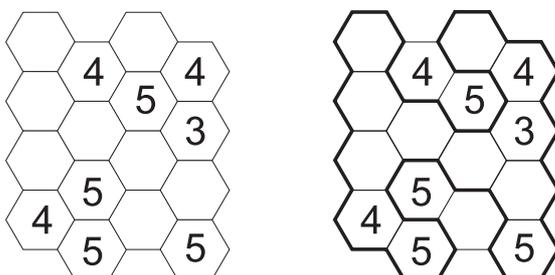
11. Magnets (20+30 Points)

The grid consists of magnetic and non-magnetic 2x1 plates. Each magnetic plate has two halves: one positive (+) and one negative (-). Halves containing the same symbol cannot be adjacent. The numbers in the extreme outside belt (right and below) of the grid indicate the number of negative magnetic halves in the corresponding row or column, and the numbers in the inner belt (right and below) of the grid indicate the number of positive magnetic halves in the corresponding row or column. Show the positions of the magnetic plates, indicating the symbols in each one of the halves.
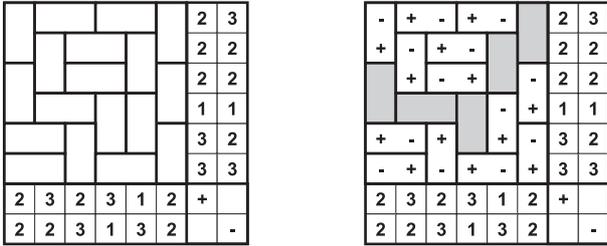
12. Division (25 Points)

Fill each empty cell with a digit from 0 to 9 so that the shown division operation is correct. Numbers consisting of multiple digits cannot begin with zero.
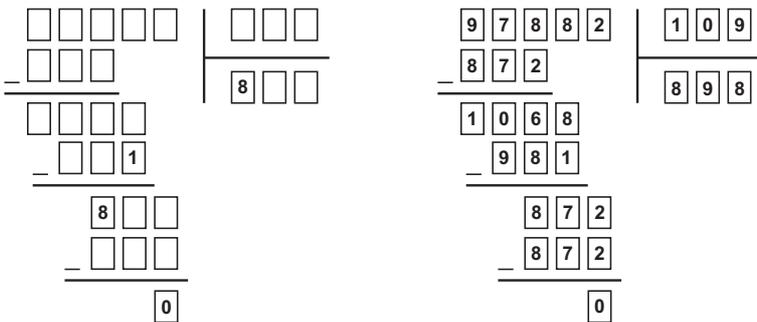
13. Moonstar (12 Points)

Paint the maximum number of moonstars which don't overlap each other. Moonstar and painted moonstar figures are shown below. The moonstar figure is a solid figure where the positions of moon and star are fixed as shown. Note that only the solution with the maximum possible number of painted moonstars will be deemed correct.
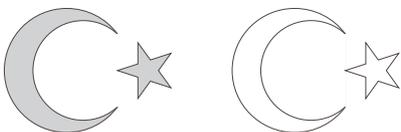
14. Ying Yang (20+20 Points)

Fill each empty cell with either a black circle or a white circle. All white circles should form a single interconnected area and similarly all black circles should form a single interconnected area. There cannot exist any 2x2 cell region consisting of same colour circles anywhere in the grid.
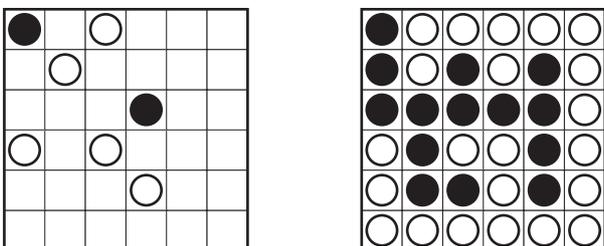
The raw scores will be converted into points through methods that will be revealed at a later time.

Optimization 1: Operation

Your goal is to obtain the given target numbers by using the given number set and arithmetic expressions. Only basic arithmetic operations and parentheses may be used. No numbers can be written together to obtain higher-digit numbers. Each given number can be used at most once and each given number can be used only in one expression. Usual priorities of arithmetic expressions hold, so use parantheses where necessary. Show your operations and the unused numbers.

Maximize the score: sum of obtained target numbers – sum of not obtained target numbers + unused given numbers

Example:

Given numbers: 1,2,3,4,5,6   Target numbers: 12,13,14

12= 3x4   14= 2x(1+6)   Score: 12+14-13+5 = 18

Optimization 2: Words

Enter at most one letter into the empty cells in order to read the given two words. Words can be read moving between neighbouring cells, even diagonally. A letter in the grid can be used several times for both words.

Handicap point: 2 x (Amount of the word read more/ Amount of the word read less)

Maximize the score: 3 x (Amount of word 1 read + Amount of word 2 read) – Handicap point

Example:

WPC
PVC

C	W	C
V	P	V
P	W	C

Amount of WPC: 6 Amount of PVC: 4   Handicap point: 2 x (6/4) = 3

Score: 3 x (6 + 4) – 3 = 27

Optimization 3: Path

Find the longest path that starts at the top left corner and ends at the bottom right corner. You should follow a route that reads one of the two given words moving between neighbouring cells (even diagonally) at a time. The path cannot cross itself. Empty cells may be filled with any letters which can be used as part of the path.

Maximize the score: Length of the path + number of unfilled empty cells

Example: **WPC PVC**

Score: 39+2 = 41

1. Diamond Islands (10+16 Points)

Identify and mark some regions as islands to obtain the given number of islands in the grid. Islands may not touch each other, not even diagonally. There are no islands on given black regions.

6 Diamond Islands
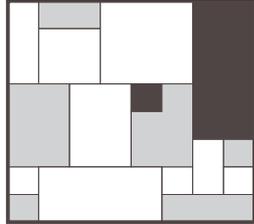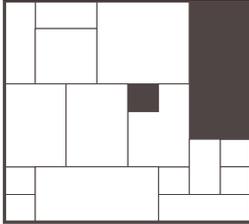
2. Octagon Fences (22 Points)

Draw a continuous loop in the grid, following the grid lines. Numbers in the grid indicate how many edges of that cell are used by the loop. The loop cannot touch or cross itself.
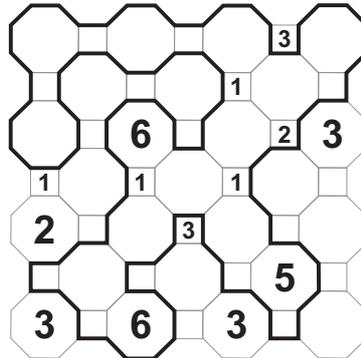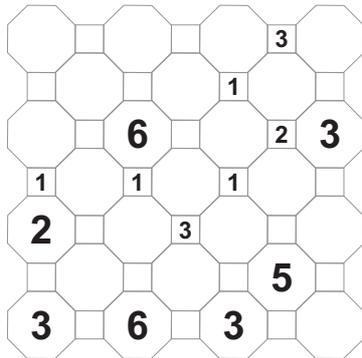
3. The Persistence Of Memory (6+9 Points)

Locate a snake in the grid that starts and ends in the cells which contain the black dots, that travels horizontally and vertically without touching itself at any point. All given highlighted regions contain parts of the snake. The regions having the same shape should have the same appearance with regard to the snake parts going through them, without any rotations. Note: all identical (same shape and same size) highlighted regions are oriented the same way in the puzzle grid.
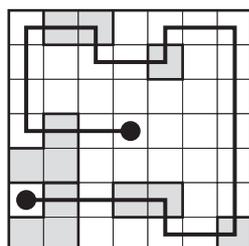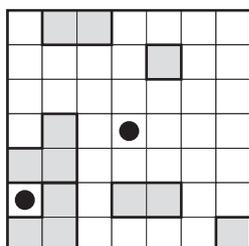
4.Skyscrapers Either Or (17+17 Points)

Fill in each cell of the grid with digits 1-6 (1-4 for the example), so that each digit appears exactly once in each row and in each column. Each digit inside the grid represents a building with the height of the digit itself. Numbers outside the grid indicate EITHER a)the number of buildings that can be seen by an observer looking into the grid in the corresponding direction, taking into account that higher buildings block the view of lower buildings from the observer, OR b)the height of the first visible building in that direction.
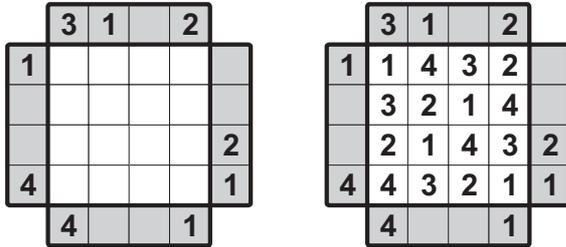
5.First Letter (22 Points)

Place the given words in the diagram, reading either from left to right or from top to bottom. All words should be interconnected and there cannot exist any word which is not on the given list. The circles in the diagram indicate the first letters of the words and all circles are given.

ANTALYA
PUZZLE
CORAP
PAZI

6.Circle Division (15+23 Points)

Draw given number of straight lines in the circle so that the sum of the numbers in all formed regions are the same. Lines should start and end on the circle perimeter and all formed regions should contain numbers.
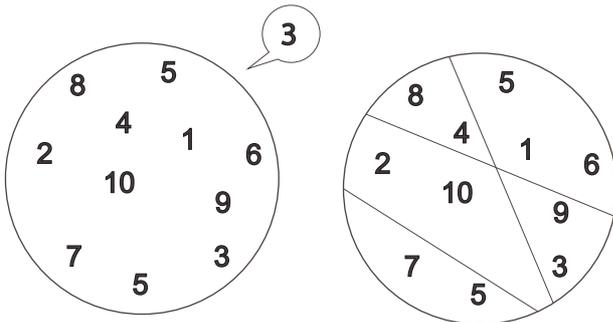
7.LITS (17+20 Points)

Blacken four cells in each outlined area so that each area includes one tetromino shape. Tetrominoes may be rotated and/or mirrored. Blackened cells should form a single interconnected area which does not have any 2x2 square fully painted black. Same tetrominoes cannot touch each other from the sides, but they may touch each other diagonally.
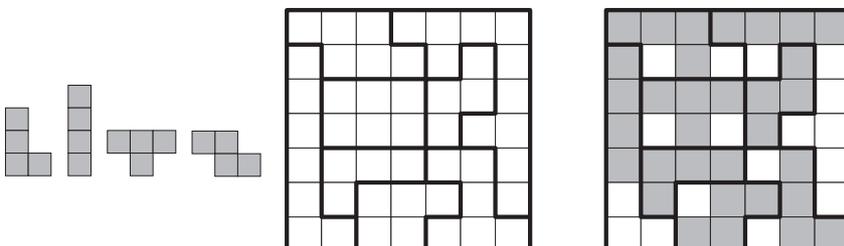
8.Primesnake (43 Points)

Fill in every circle inside and outside the grid with one of the given prime numbers. Prime numbers larger than those given are not needed. Locations of all prime numbers inside and outside the grid are given as circles.

Draw a snake of numbers in the diagram that starts with 1, grows in value with every visited adjacent square and ends at a prime number. The snake goes through all circles inside the grid and does not touch itself, not even diagonally. The numbers outside the grid indicate the number of squares that are occupied by the snake in the corresponding direction.

2,3,5,7,11
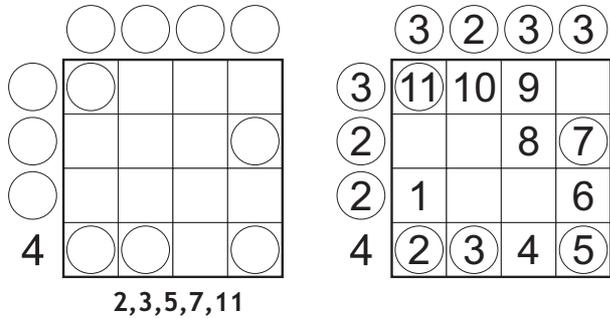
9.Hang Up (35 Points)

Hang a rectangle (possibly a square) from its corner on each nail. All rectangles should have different perimeter lengths (not necessarily different areas) and their center of gravity should always be on the line going down from that nail. Rectangles cannot touch each other, not even diagonally.
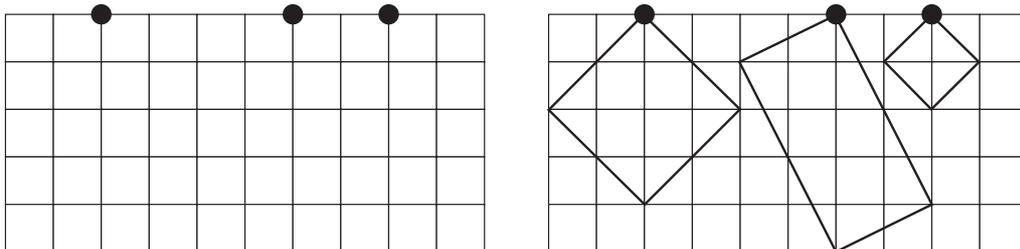
10.Common Group Max (15+27 Points)

In each puzzle, you will be given three groups (A, B, C) consisting of some positive integers. You will also be given a fourth group (D) which will consist of exactly three positive integers, which you will distribute into groups A, B and C. Within each group of numbers (A, B and C), you are allowed to perform a series of arithmetical operations (= SAROP) (+ , - , x , /) in order to reach new numbers. You can use each group member only once during these operations, but you may elect not to use some of the numbers in a group at all. You don't need to use each type of arithmetical operation within a SAROP; you may even elect to use only one type of operation. The outcome of one operation may be input into a new operation. The outcome of each and every operation is only allowed to be a positive integer, and no fractional results are allowed.

Your task is to select which number in group D should be put into group A, which one into group B and which one into group C, such that the HIGHEST COMMON attainable integer (through SAROP) in all three groups is a maximum (= MAXI). The correct solution should include all three completed groups (A, B and C) , the integer MAXI, and each of the three mathematical expressions (A, B and C) used to reach the integer MAXI. No partial points will be given to incomplete solutions, and no negative points will be given to incorrect solutions.

> A = 1, 2   ; B = 3, 6   ; C = 4, 5   ; D = 7, 8, 9
> Solution: A = 1, 2, 9 ; B = 3, 6, 7 ; C = 4, 5, 8   ; MAXI = 27
> Expression A: (2 +1) x 9 = 27 , or   2 + 1 = 3 , 3 x 9 = 27
> Expression B: (3 x 7) + 6 = 27 , or   3 x 7 = 21 , 21 + 6 = 27
> Expression C: (4 x 8) - 5 = 27 , or   4 x 8 = 32 , 32 - 5 = 27

11. Akkara Loop (12+20 Points)

Paint some cells black to form a single closed loop that does not touch itself even at a point. Numbers in painted cells indicate the number of unpainted cells in neighbouring squares. Numbers in unpainted cells indicate the number of painted cells in neighbouring squares.

3			1
2			2
	1	4	

3			1
2			2
	1	4	
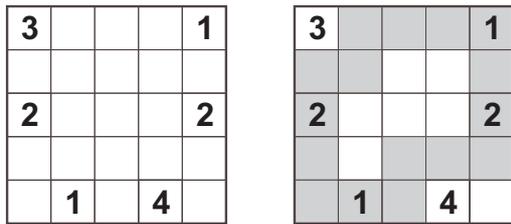
12. Stardust (10+16 Points)

Place some squares in the grid, each having the size of 3x3 unit squares. When all squares are placed, each star should be surrounded by exactly one square. Some cells of the squares can be outside the grid, but the central cell should always be inside the grid. Squares cannot overlap each other, but they can share edges. Central cells of squares cannot overlap the stars.
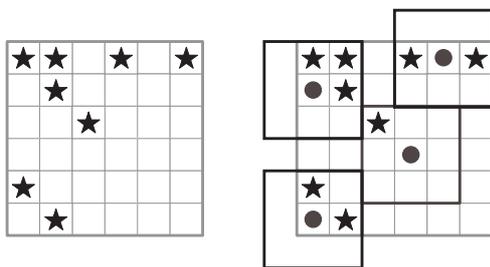
13. Easy As Jigsaw ABC (14 Points)

Place letters A-E (A-C for the example) so that in each row, in each column, in each outlined area and in the remaining grey cells inside the grid there will exist exactly one of each letter A, B, C, D, E (A, B, C for the example). The letters outside the grid indicate the letter seen first in the corresponding direction.
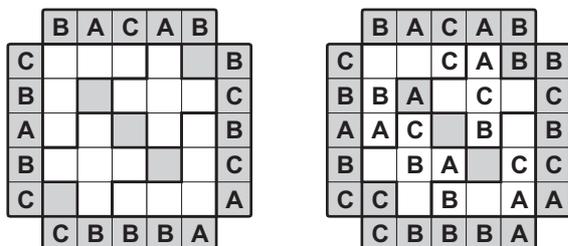
14. Diagramless Kakuro (24+40 Points)

Place digits 1-7 and some black squares into the grid to form a valid classic Kakuro puzzle. No digit may be repeated within a sum. The black squares in the grid have 180-degree rotational symmetry, all white squares are connected, and all digits belong to a sum of two or more numbes in both directions.

Clues given next to the grid indicate the sums that are formed in the grid. For the row clues, this means all clues in the first row (from left to right) are listed before clues in the second row, and so on. For the column clues, all sums that have their uppermost cell in the first row (from left to right) are listed before clues that have their uppermost cell in the second row, and so on.

Across (in order):
8,6,7,21,7,7,10,11,8,12,15,9,16,4

Down (in order):
3,28,9,9,28,4,8,8,9,14,11,10
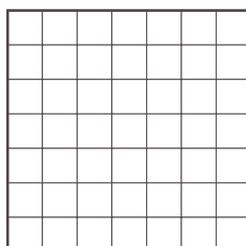
		3		8	9	9		4	
		9	28	11	14	8	28	10	
8	6	1	7		1	2	3		
7	21	2	5		6	7	5	3	
7	7		4	1	2		6	1	
10	11		3	7			7	4	
8	12	6	2		4	1	7		
15	9	3	1	4	7		2	7	
16	4		6	7	3		1	3	

This part consists of 15 puzzles projected on a screen. Competitors will have a limited period of time (as displayed on the screen) to examine each puzzle.

All puzzles are based on correcting the given equations written with matches. Matches will be numbered for using in writing the answers.
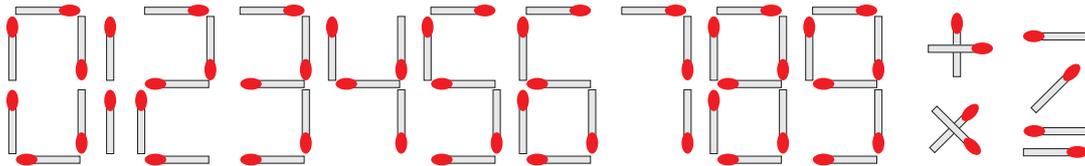
Type 1: Remove Matches

Remove one or two matches to correct the given equation.
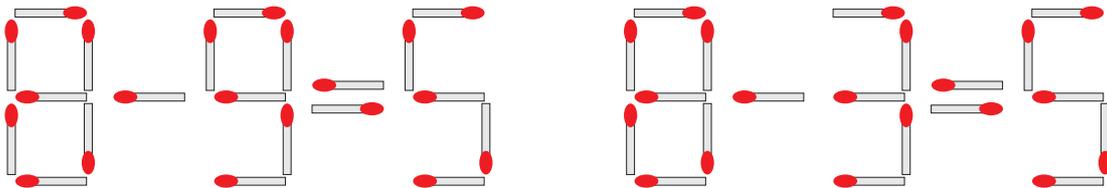
Answer format: Write the numbers of the matches that should be removed.

Type 2: Add Matches

Add one or two matches to correct the given equation.
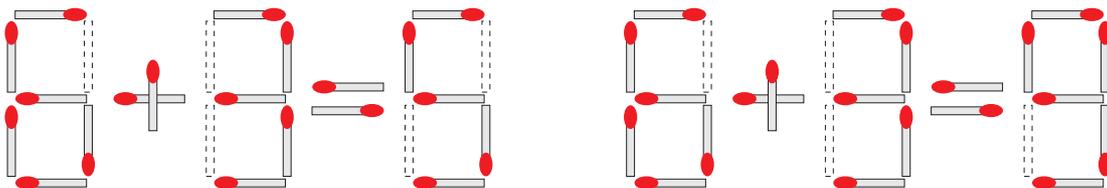
Answer format: Write the letters of the empty spaces where the matches should be added.

Type 3: Move matches

Move one or two matches to correct the given equation.
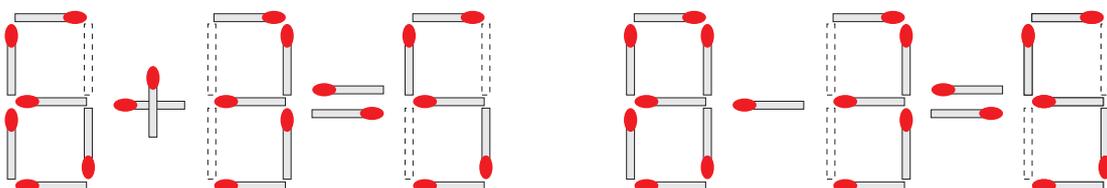
Answer format: Write the numbers of the matches that should be moved, and the letters of the empty spaces where the matches should be added.

Four Battleships puzzles will be distributed separately. Your goal is to overlap these four puzzles in the correct order and to solve each puzzle. The grids will have holes, through which the lower layer can be seen. The holes in the lowermost grid will have no meaning. The orientation of the grids should be such that the letters representing each grid will overlap with respect to each other.

Each competitor that correctly solves all four puzzles with the correct order receives 140 points. 30 points will be given for each grid completed correctly, only in the case that it is part of the complete solution.

Battleships: Enter the given fleet into the diagram. The ships may not touch, not even diagonally. The numbers outside the grid indicate the number of ship segments in the corresponding row or column.
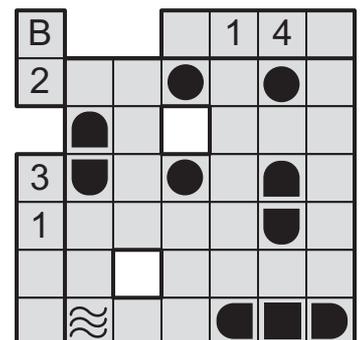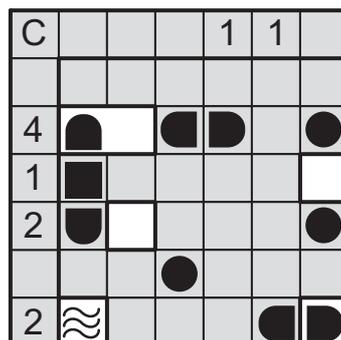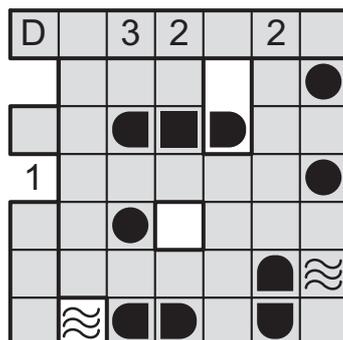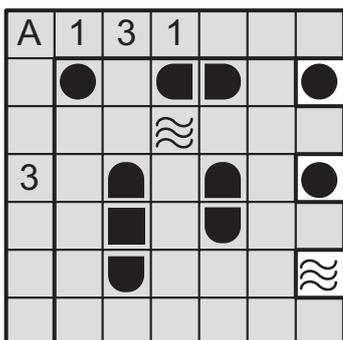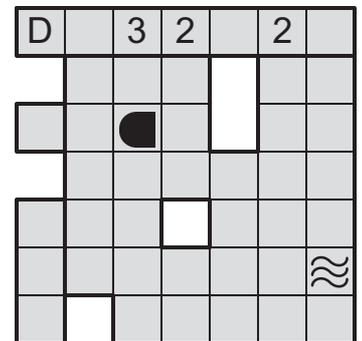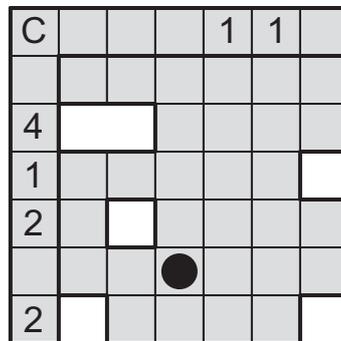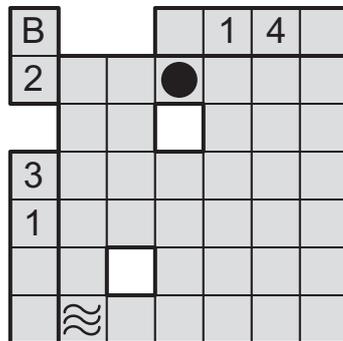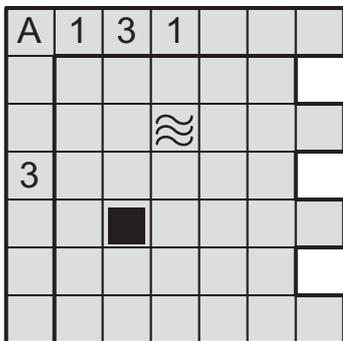
In this part, the competition room will be separated into two sections. In one section there will be individual tables, where each team member will solve four individual puzzles. In another section there will be team tables, where all members of the team will solve one team puzzle together. Any member can proceed to the team table at any time, with or without solving the four individual puzzles, after submitting his/her individual puzzle sheet. Once a team member proceeds to the team table, he/she cannot go back to continue solving the individual puzzles. Each time a member proceeds to the team table, he/she will be given clues for the team puzzle.

Each individual team member will receive 40 points for every correctly solved individual puzzle. Each team will receive 260 points for the correctly solved team puzzle.

Order Bonus: The first five teams to correctly solve the team puzzle shall receive 70, 50, 35, 20, 10 points respectively. Any team whose members has solved less than 15 individual puzzles out of 16 in total cannot receive any Time Bonus or Order Bonus points.

The Weakest Link

Four Kakuro variations are linked to each other as follows: Each letter from A to J is crypted with a digit from 0 to 9. Same letters represent the same digit, different letters represent different digits.

1.False Kakuro (40 Points)

Enter a single digit from **1 to 9** into each of the empty cells so that the sum of numbers in each Across and Down answer equals the value given to the left or above, respectively. No digit may repeat within a single answer.

All given numbers and letters in this puzzle are wrong. The correct numbers should be 1 greater or 1 lower than the given clue. The correct letters should be alphabetically 1 before or 1 after the given clue. A and J are not connected to each other.

2. Domino Kakuro

Enter a single digit from **1 to 7** (1-5 for the example) into each of the empty cells so that the sum of numbers in each Across and Down answer equals the value given to the left or above, respectively. No digit may repeat within a single answer.

All placed numbers should form the given domino set. All cells should be occupied with dominoes and all dominoes should be used exactly once.

3. Sudokuro

Enter a single digit from **1 to 7** (1-5 for the example) into each of the empty cells so that the sum of numbers in each Across and Down answer equals the value given to the left or above, respectively. <u>No digit may repeat within a single row, column and outlined area.</u>
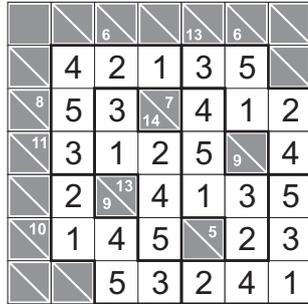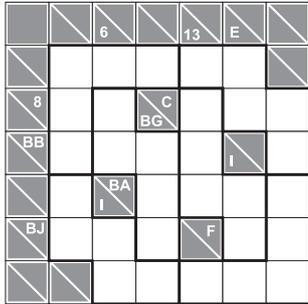
4. Dikuro

Enter a single digit from **1 to 9** into each of the empty cells so that the sum of numbers in each Across and Down answer equals the value given to the left or above, respectively. No digit may repeat within a single answer.
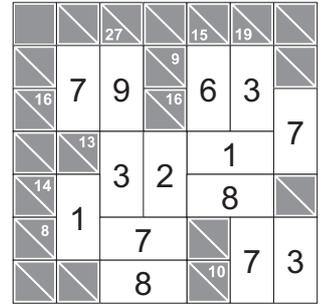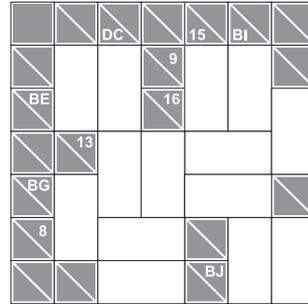
A	B	C	D	E	F	G	H	I	J
3	1	7	2	6	5	4	8	9	0

Team Puzzle: ORu Kakuro

Enter a single digit from **1 to 9** into each of the empty cells so that the sum of numbers in each Across answer equals one of the values given to the left and right, and the sum of numbers in each Down answer equals one of the values given to the above and below.
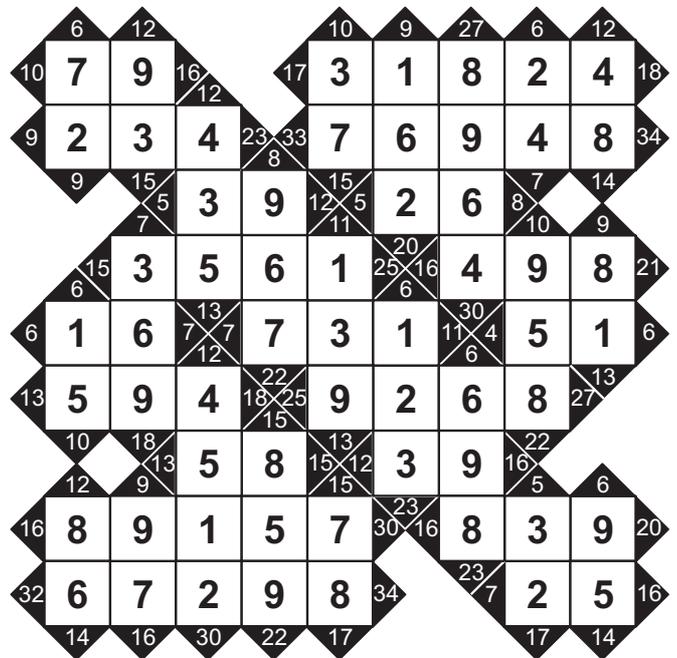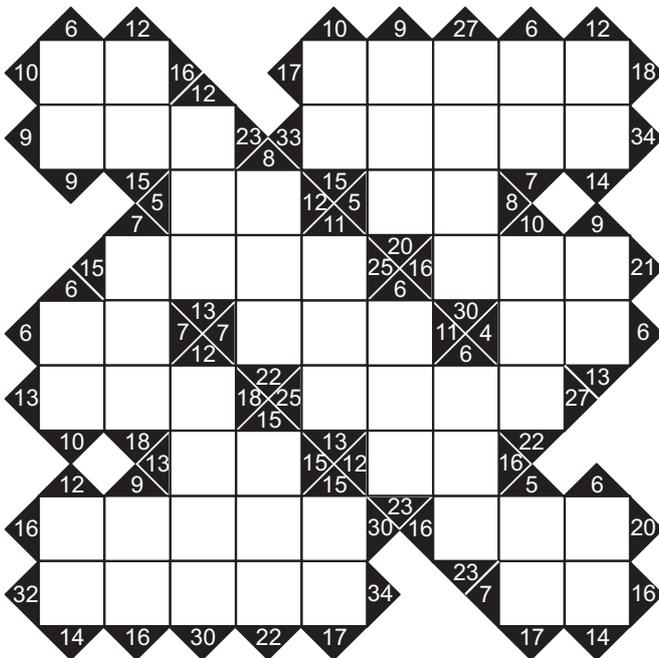
Each team member who proceeds to the team table will be given some clues for the team puzzle, indicating the correct sum values for certain answers.

This part consists of several puzzles projected on a screen. Competitors will have a limited period of time (as displayed on the screen) to examine each puzzle.

- What is the number of single closed areas inside the shape, enclosed with red lines?

- How many red balls are needed to balance the system?

?=2
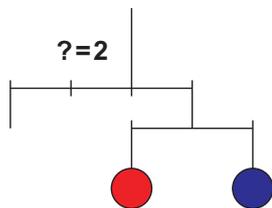
- Which die is different from the others?

- Which shape is the exact match of the unfolded cube?

- Which number follows the sequence?

- Which shape follows the sequence?

- Which picture gives the correct shadow of the figure?

- Four of the given shapes can form a 3x3x3 cube. Which shape is the odd-one-out?

- Find the only entrance that can reach the exit.

- The pictures can be arranged in pairs. Which one is left out?

- Find the value of the question mark.

- How many WPC can be read in the table, moving between neighbouring letters?

a)15 b)16 c)17 d)18

W	P	C
W	P	C
W	P	C

- Which set of operation signs should be used to obtain the target number?

    Target number: 22   Given numbers: 1, 2, 3, 5
    a)+ + x   b)x + -   c)x x -   d)x x +

- Examine the picture given for 15 seconds. Find the missing figure in the following scene.

- Examine the picture given for 15 seconds. Find the same figure in the following scene.

1. Tapa (15+20 Points)

Paint some squares black to create a continuous wall. Number(s) in a square indicate the length of black cell blocks on its neighbouring cells. If there is more than one number in a square, there must be at least one white cell between the black cell blocks. Painted cells cannot form a 2x2 square or larger field. There are no wall segments on cells containing numbers.
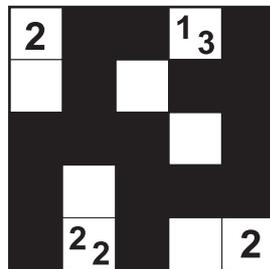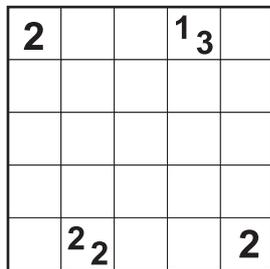
2. Hexa Tapa (10+25 Points)

Paint some cells black to create a continuous wall. Number(s) in a cell indicate the length of black cell blocks on its neighbouring cells. If there is more than one number in a cell, there must be at least one white cell between the black cell blocks. Painted cells cannot form three hexagons meeting at a point. There are no wall segments on cells containing numbers.
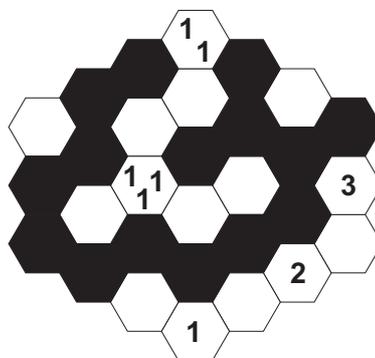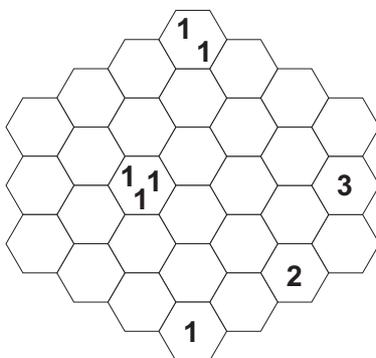
3. Tapa Distiller (20/20/20/20 Points)

Paint some squares black to create a continuous wall. Number(s) in a square indicate the length of black cell blocks on its neighbouring cells. If there is more than one number in a square, there must be at least one white cell between the black cell blocks. Painted cells cannot form a 2x2 square or larger field. There are no wall segments on cells containing numbers.

Clues of four separate puzzles are given in one grid. Distribute the clues to four grids and solve each puzzle. The cells with clues do not overlap, each clue cell should be fully visible in one grid only.

The scoring depends on the number of correctly solved grids. A solved grid shall receive points only in the case where the individual grid is part of the complete correct solution.

4. TAPA LOGIC (50 Points)

Paint some squares black to create a continuous wall. Number(s) in a square indicate the length of black cell blocks on its neighbouring cells. If there is more than one number in a square, there must be at least one white cell between the black cell blocks. Painted cells cannot form a 2x2 square or larger field. There are no wall segments on cells containing the crypted letters.

Each letter in "TAPA LOGIC" is encrypted with a digit from 0 to 8 (letters OAPC and digits 0-4 for the example). Same letters mean the same digit, different letters mean different digits.

OAPC : 0 - 4

The individual score in this part will depend on the number of correctly solved puzzles. The scores based on the number of solved puzzles are 50, 100, 150, 200, 250, 315 points respectively.

Matchmaker

Your goal is to solve six puzzles. You're given seven different grids and eight different instructions. Match the grids with the instructions and solve the puzzles. One grid and two instructions will be unused.
Any grid may have several solutions for any type, but the six puzzles can all be solved only in one way.
Partial points will be given only for every correctly solved grid which is part of the complete solution.

Hamle

Move every numbered square in one of the four directions, so that numbers in the cells indicate the length of their moves. <u>When all moves are done</u>, all white cells should be interconnected and numbered cells should not touch each other from the sides.
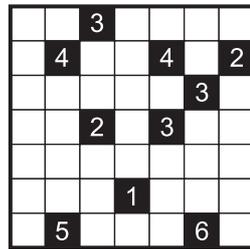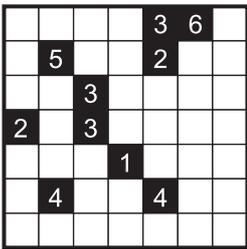
Islands

Create white areas (islands), surrounded with blackened cells which are linked to a continuous sea. The numbers in the grid indicate the size of the corresponding white areas. An area should contain at least one number and all numbers are given. The sea cannot form any 2x2 square. White areas may touch each other only diagonally.
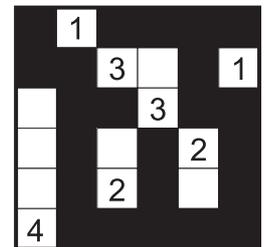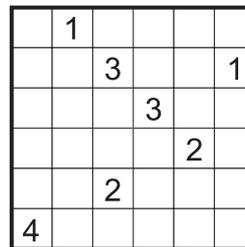
Kuromasu

Blacken some of the empty cells so that all remaining white cells form a single interconnected area. Numbers in the grid indicate the total of white cells that can be seen from that cell, <u>excluding</u> the cell itself. Blackened cells cannot touch each other from the sides.
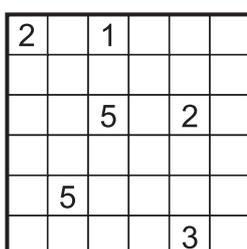
Masyu

Moving between edge-to-edge neighbouring cells, draw a closed path that passes through every digit and doesn't cross itself. The path must turn at every <u>even digit</u>, but can not turn immediately before or after. And the path can not turn at any <u>odd digit</u>, but must turn immediately before and/or after.

Pills Sum

Locate some capsules in the grid, each containing the digits 1,2,3. Capsules cannot touch each other even at a point. Numbers in the diagram indicate the sum of numbers touching that cell from the sides.

	5				
			5		
3					
1				3	
		2			

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

Tapa

Paint some squares black to create a continuous wall. Numbers in the grid indicate the length of black cell blocks on its neighbouring cells. Painted cells cannot form a 2x2 square or larger. There are no wall segments on cells containing numbers.

2			¹3		
	²2			2	

Tetro Minesweeper

Blacken some cells to obtain all the given different tetromino pieces. The numbers inside the grid indicate the amount of blackened cells in neighbouring cells. The tetrominoes cannot touch each other even at a point.

		1		
	4			
	2			

Top - Heavy Number Place

Fill the grid with digits 1-5 (1-4 for the example) so that each digits appears exactly once in every row/column. Where the digits adjoin vertically, the upper digit must be bigger.

	1			
		3		4
	4	1		3
3				
		3		2

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

Each team will receive one large puzzle sheet containing 4 groups of 4 linked puzzles, 16 puzzles in total. The teams are entirely free to decide how they will solve these puzzle groups. If they so desire, one or two or three or four team members may be working on the same puzzle at any given time. Teams with complete and correct solutions to all sixteen puzzles of this part will be eligible to obtain Time and Order bonuses.

1.4x4 Minesweeper

Place some mines in each diagram so that the numbers inside the grid indicate the number of mines in their neighbouring (including diagonal neighbours) cells. When all four puzzles are solved, every single coordinate should contain exactly one mine. The example is for only two grids.
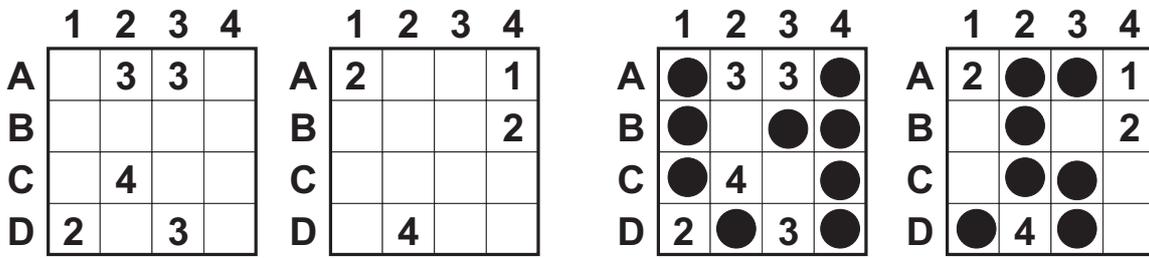
2.Black Or White

Two of the given puzzles are Masyu and two of them are Loop puzzles. You need to determine which puzzle is from which type for solving.

Deformable Masyu:
Moving between edge-to-edge neighbouring cells, draw a closed path that passes through every circle and doesn't cross itself. The path must turn at every black circle, but can not turn immediately before or after; and the path can not turn at any white circle, but must turn immediately before and/or after. You are allowed to blacken any number of the given white circles, deforming them into black circles.

Loop:
Draw a closed loop in the grid moving horizontally and vertically, avoiding all cells containing black circles, and passing through every cell except for those containing black circles. The loop cannot change direction on cells with white circles.

Masyu　　　**Loop**
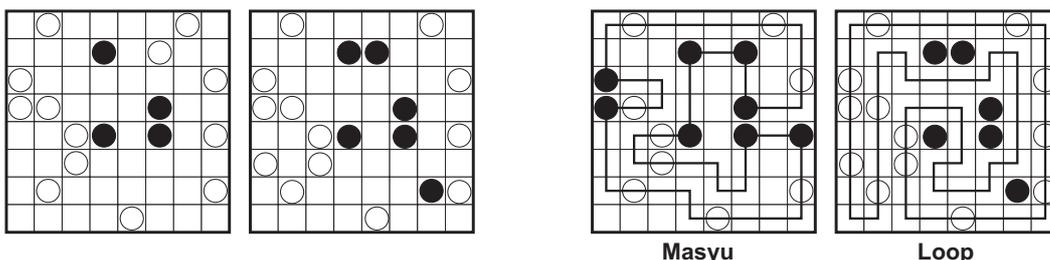
3. Mr. Universe

Locate a snake in the grid, that travels only horizontally and vertically, without touching itself even at a point. The snake travels along four grids, each of the grids belonging to a different puzzle. The instructions for each grid are listed below. Each rule in the instructions is valid only for the cells of the corresponding grid. The head and tail of the snake may be anywhere in any grid.

1. Obtain snake segments with linking all the given pentomino pieces. The letters outside the grid indicate the pentominoes that can be seen first in the corresponding row / column. Pentominoes may be rotated and/or mirrored. There are no pentomino pieces in crossed cells.

2. Each tree in the diagram has a tent, connected to it from the side. Tents cannot touch each other even at a point. All cells which are not occupied by a tree or a tent are parts of the snake.

3. Blacken some cells to obtain snake segments. Numbers in the grid indicate the number of blackened cells in their neighbouring four squares.

4. Paint some squares black to obtain snake segments. Number(s) in a square indicate the length of black cell blocks on its neighbouring cells. If there is more than one number in a square, there must be at least one white cell between the black cell blocks. There are no snake segments on cells containing numbers.

4.Half-life

You are given four different puzzles linked to each other as follows: After solving each puzzle, carry the solution on grey cell blocks to the next one and place it anywhere on the grid. You can rotate this block but cannot mirror it. Do not carry the given clues, you should carry ONLY what you've placed or painted. If there is a digit to be carried, it should be carried to an empty cell.

1.Tapa: Paint some squares black to create a continuous wall. Number(s) in a square indicate the length of black cell blocks on its neighbouring cells. If there is more than one number in a square, there must be at least one white cell between the black cell blocks. Painted cells cannot form a 2x2 square or larger. There are no wall segments on cells containing numbers.

2. Coralfinder: Paint some cells black to reveal the location of the coral. The coral is formed of edge-to-edge neighbouring cells without any holes and cannot touch itself, not even diagonally. The numbers outside the grid indicate the number of painted cells in the corresponding row/column, not necessarily in order. Painted cells cannot form a 2x2 square.

3. Japanese Sums: Fill the grid with digits 1-7 (1-5 for the example) so that no digit is repeated within a row or a column, and blacken all the remaining cells of the grid. Numbers outside the grid indicate the sums of continuous number groups encountered in the corresponding directions, in order. A single number in a direction should also be considered as a number group. There must be at least one blackened square between different number groups. The sum information for some rows/columns may be missing.

4. Islands: Create white areas (islands), surrounded by blackened cells which are linked to form a continuous sea. The numbers in the grid indicate the size of the corresponding white areas. An area should contain at least one number and all numbers are given, except those to be possibly carried forward from the previous puzzle. The sea cannot form a 2x2 square or larger field. White areas may touch each other only diagonally.

This part will consist of new puzzles, which will be given without any instructions. You have to examine the examples of each puzzle and find the logic to solve each type.

The point distribution for puzzles will not be known by the solvers. After all answer sheets are checked, the puzzles will be valued considering their rate of being solved. The point distribution for the puzzles will be 15, 18, 22, 24, 26 and 30 increasingly from the most solved to the least solved one. There may be more than one of each type of puzzle, but individual puzzle values will be irrespective of puzzle type.

If a certain puzzle fails to be solved by any competitor, scoring will start from 18 points, and so on.

For each puzzle of this part, you are required to input the specified portion of your solution into your answer sheet. Since the puzzle booklets will not be collected at the end of the round, please pay extra attention to the accurate entry of solutions into the answer sheet. Even though your solution may be correct on your puzzle booklet, you will not get any points if the answer is entered incorrectly.

The spaces in which the answers will be entered in the championship will be as shown below:

Sigma Snake (66 points)

| 1 | | 6 | | 2 | | 12 | | Points |
| 3 | | 20 | | 4 | | 28 | | |

Step by step (73 points)

| 5 | | 8 | | 6 | | 15 | | Points |
| 7 | | 23 | | 8 | | 27 | | |

Polygraph (77 points)

| 9 | | 13 | | 10 | | 17 | | Points |
| 11 | | 20 | | 12 | | 27 | | |

Slash Pack (82 points)

| 13 | | 11 | | 14 | | 19 | | Points |
| 15 | | 24 | | 16 | | 28 | | |

Tripod Sudoku (78 points)

| 17 | | 13 | | 18 | | 18 | | Points |
| 19 | | 21 | | 20 | | 26 | | |

Four Squares (72 points)

| 21-24 | | 72 | | Points |

±1 (58 points)

| 25 | | 8 | | 26 | | 12 | | Points |
| 27 | | 18 | | 28 | | 20 | | |

Tapa Variations (72 points)

| 29 | | 10 | | 30 | | 18 | | Points |
| 31 | | 20 | | 32 | | 24 | | |

Magic Fence (78 points)

| 33 | | 12 | | 34 | | 15 | | Points |
| 35 | | 18 | | 36 | | 33 | | |

Pentomino Kakuro (94 points)

| 37 | | 20 | | 38 | | 23 | | Points |
| 39 | | 25 | | 40 | | 26 | | |

Total Points

1-4.Sigma Snake (6+12+20+28 Points)

Draw a snake of letters in the grid, whose head and tail are given in circles and that doesn't touch itself, not even diagonally. Avoid grey cells with numbers. The snake must be formed only of the worded form of numbers (as written in the given word list) in any order, starting from the head, moving along adjacent squares and ending on the tail (and NOT the opposite). A number on a grey cell gives the total value of the worded numbers that pass through its neighbouring cells, including the diagonal neighbours. You don't need to use all the words but you can use each word only once.

ONE
TWO
THREE
FOUR
FIVE

O		T	7	
				I
		9		
O	4			

O	W	T	7	
		E	V	I
		9		F
N	E	T		E
O	4	H	R	E

Answer Format:

Write all the numbers in order from the head to the tail of the snake.
The answer for the example would be: 1352

5-8.Step By Step (8+15+23+27 Points)

Starting with 1, fill the whole grid with numbers 1-n, jumping between the squares in any one of the four directions. If you are on an odd number, you must jump one cell away (to one of the adjacent cells). If you are on an even number, you must jump two cells away (only in one of the directions). You should follow the route 1, 2, 3, ..., n. Your route may not leave the grid at any time, and you may not use the black squares as part of your route.

1-13

1			
		13	

1-13

1	2		
	8	7	13	6
	3	4		5
	9		12	
	10		11	

Answer Format:

Write the content of the grey cells in increasing order. The answer for the example would be: 2,5,7,9,11,12

9-12. Polygraph (13+17+20+27 Points)

Draw a single continuous loop by connecting neighbouring dots horizontally or vertically. The clues inside the loop indicate the number of its edges used by the loop. The clues outside the loop indicate the number of its edges NOT used by the loop.
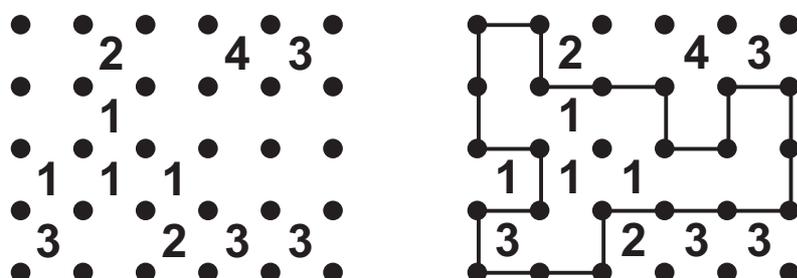
Answer Format:

Write the sum of the numbers inside the loop. The answer for the example would be: 6

13-16. Slash Pack (11+19+24+28 Points)

Divide the grid into shapes, using only the diagonals of the squares, without any loose ends. Each shape must contain numbers from 1 to 5 (1 to 3 for the example). Two diagonals cannot cross in one square.
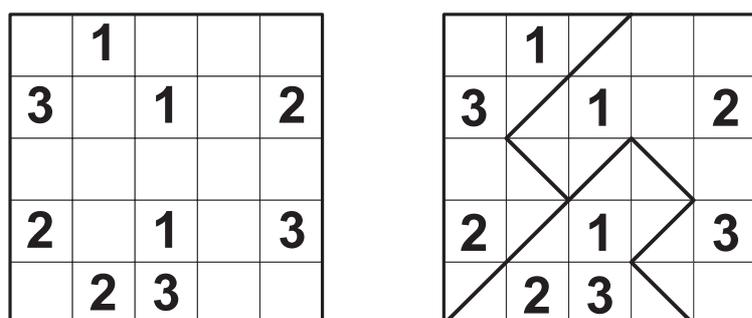
Answer Format:

Draw the content of the two main diagonals in the given cells using signs / and \ ; first from top left to bottom right, then from bottom left to top right. Use - for empty cells. The answer for the example would be:

-///-	///--

17-20. Tripod Sudoku (13+18+21+26 Points)

Fill the grid with digits 1-6/1-7 (1-6 for the example) and divide the grid into some regions, so that each digit appears exactly once in every row, column and region. All points where three lines meet are given. There are no points where four lines meet.

1-6
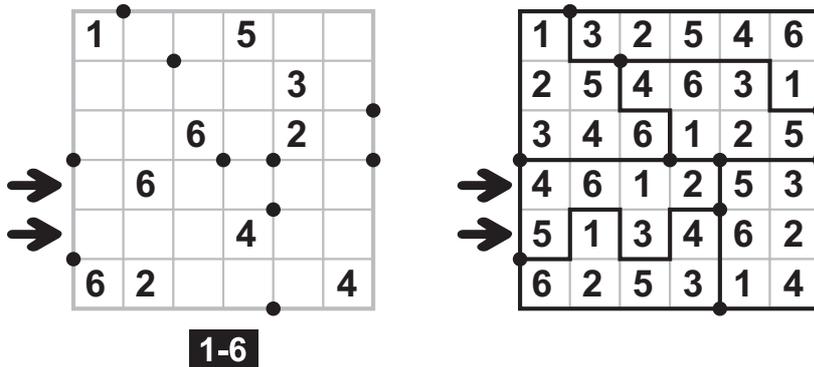
Answer Format:

Write the content of the marked rows / columns. The answer for the example would be: 461253, 513462

21-24. Four Squares (72 Points)

The four puzzle types in this part: Skyscrapers, Battleships, Tents and Snake all rely on clue numbers on the outside of the four puzzle grids. Find the missing clues that are shared between the grids so that all puzzles can be solved, and solve them.

Skyscrapers: Place digits 1-6 into the grid so that each digit appears exactly once in each row and in each column, and the clue numbers are the number of buildings that can be seen from the corresponding direction.

Battleships: Place the given fleet into the grid so that ships do not touch each other, not even diagonally. The clue numbers are the number of ship segments in the corresponding direction.

Tents: Locate the tents in the grid. Trees and tents appear in distinct pairs, in horizontally or vertically adjacent squares. Tents do not touch each other, not even diagonally. The clue numbers are the total number of tents in the corresponding direction.

Snake: Find a path of sequentially numbered and edge-connected squares starting from 1, passing through 10 and 24, and ending at 30 (1-12 for the example). The path cannot loop back or touch itself, not even diagonally. The clue numbers are the number of times the snake makes a 90-degree turn in the corresponding direction.
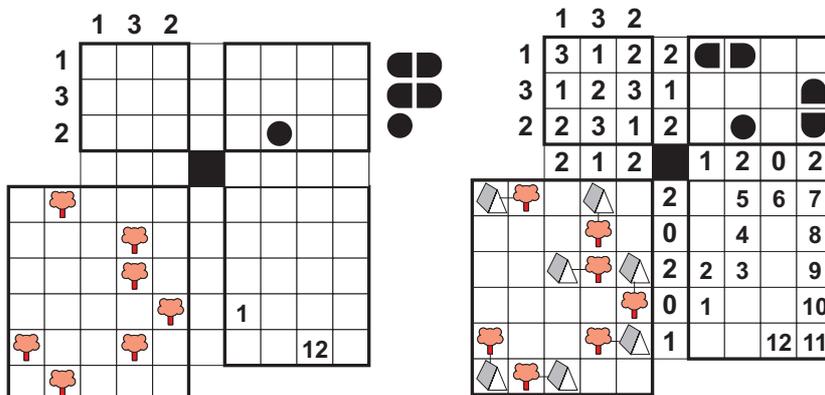
Answer Format:

Write the numbers of the snake that are in the column containing the 1-unit submarine, from top to bottom. Use – for empty cells. The answer for the example would be: 543--

25-28. ± 1 (8+12+18+20 Points)

One letter should be added to or taken out of each word in the clue list in order to obtain a valid crossword puzzle on the grid. The meanings of the words are not important at all. No cell may remain empty, and you may not add any more black squares than those already blackened. The given clues are not necessarily in order.

Across
1- TEA, GUZU
2- MEZKUR
3- LEGEN
4- KABAK
5- RAKAM
6- ARA, ILIK

Down
1- KUMBARA
2- ZER, BABA
3- ULAK
4- KEKLIK
5- MAL, ERKE
6- ANEMI

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

	1	2	3	4	5	6
1	U	Z	U	■	E	A
2	M	E	Z	K	R	■
3	B	■	L	E	E	N
4	A	B	A	K	■	E
5	R	A	K	L	A	M
6	A	A	■	I	L	I

Answer Format:

For each row, write the numbers of the columns where the letter 'A' exists. Use 0 for rows which do not contain the letter 'A'. The answer for the example would be: 6, 0, 0, 13, 25, 12.

29-32. Tapa Variations (10+18+20+24 Points)

Paint some squares black to create a continuous wall. Number(s) in a square indicate the length of black cell blocks on its neighbouring cells. If there is more than one number in a square, there must be at least one white cell between the black cell blocks. Painted cells cannot form a 2x2 square or a larger field. There are no wall segments on cells containing numbers.

29-30: Knapp Daneben Tapa: All given numbers are wrong. The correct number is either 1 higher or 1 lower, meaning a 1 can possibly turn into a zero.

31-32: Tapa Pentopool: All unpainted cells of the grid should form all of the given different pentominoes. The pentominoes may be rotated and/or mirrored, and cannot touch each other from the sides, but they may touch diagonally. There are no wall or pentomino pieces on cells containing numbers.

Answer Format:

Write the content of marked rows / columns. Use 1 for blackened cells and 0 for the rest.

29-30: The answer for the example would be: 11101,10111
31-32: The answer for the example would be: 01001111,01111000

33-36. Magic Fence (12+15+18+33 Points)

Fill the grey cells with digits so that no digit is repeated within any row and the numbers in all rows form a consecutive sequence, not necessarily in order. The numbers outside the grid indicate the range of digits in the corresponding row. Then draw a closed loop along the grid lines which does not cross itself. A digit in a cell indicates the number of the cell's edges that are used by the loop.
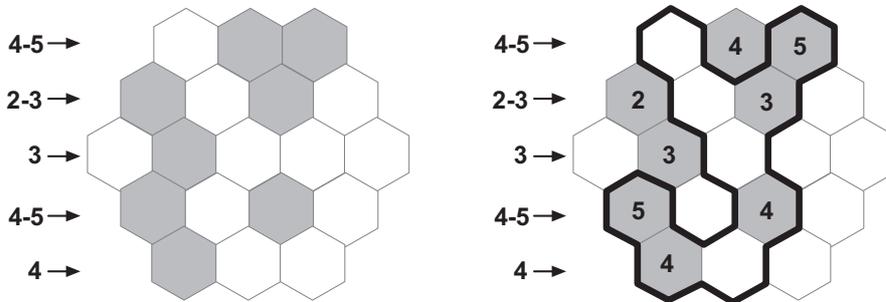
Answer Format:

Write the sizes of all the areas outside the loop in increasing order. You must write the same number more than once if there is more than one area with the same size. The answer for the example would be: 1,4,5

37-40. Pentomino Kakuro (20+23+25+26 Points)

Place the given pentomino pieces into the white cells of the grid to form a Kakuro puzzle: Enter a single digit from 1 to 9 into each of the remaining empty cells so that the sum of numbers in each Across sum equals the value given to the left of the sum and each Down sum equals the value given above it. No digit may repeat within a single sum. Pentominoes may be rotated but not mirrored and cannot touch each other, not even diagonally.
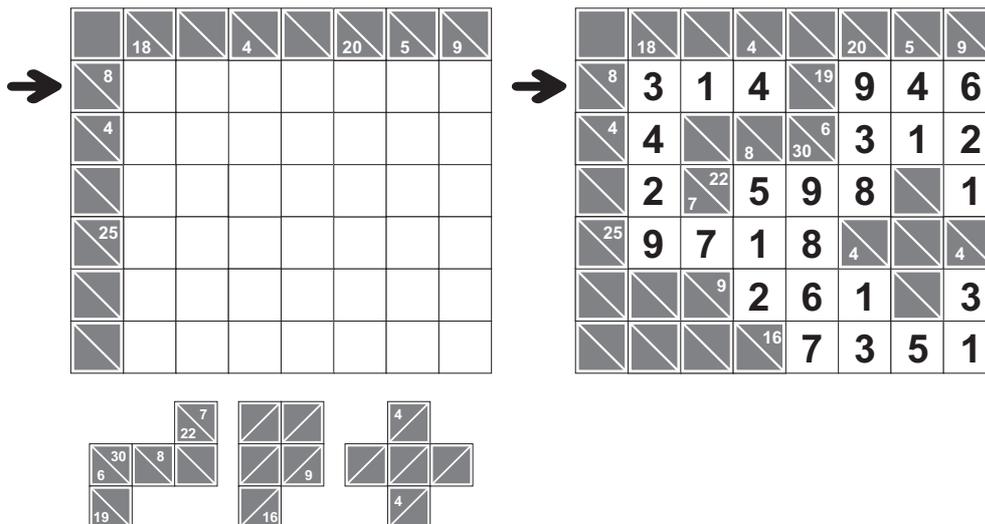
Answer Format:

Write the content of the marked row / column. Use 0 for cells with the pentominoes and ignore the outside borders of the grid containing the original given set of clues. The answer for the example would be: 3140946.

Upgrade

Upgrade the given 3x3 Skyscrapers puzzle to a 5x5 puzzle by placing ALL of the given cubes on the grid, at most one cube per square. Once a cube is placed on a cell, there are no longer 3 cells but there are 5 cells along the surfaces in the row or column containing the cube. The final puzzle should consist of three rows and three columns containing each digit from 1 to 5 once. Each digit inside the grid represents a building with the height of that digit itself. Numbers outside the grid indicate the number of buildings that can be seen by an observer looking into the grid in the corresponding direction, taking into account that higher buildings block the view of lower buildings from the observer.

Cubes only have the function to lengthen the rows or columns; they should not be considered as high buildings blocking the view. The digits under the cubes and the digits on the touching faces of adjacent cubes are not visible from any point.
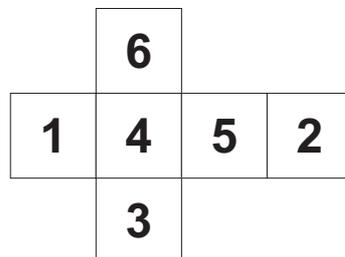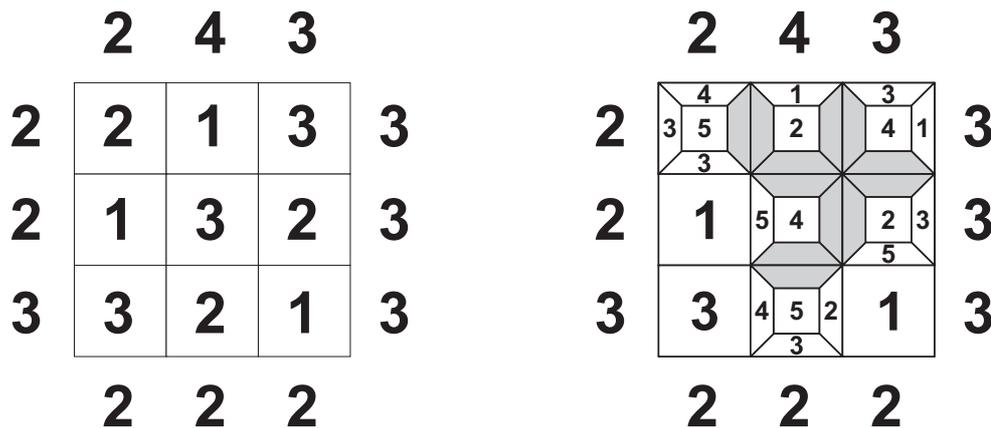
The cubes in the championship will be different from the cube in the example, and the given cubes will not necessarily be identical.

Construct a shape with the given blocks so that this shape can fit into a 3x3x3 box and stand alone without any support. The final shape must have the word "Puzzle" read on each face, moving between edge-to-edge connected visible unit squares. There should not be any unused letters visible on a certain face.Orientations of the letters should be ignored.

Each team that completes all six faces correctly shall receive 600 points. A team that cannot complete all six faces shall receive 80 points for each correctly completed face.

All puzzles are based on the puzzle ideas of the following names, respectively:

Welcome
Ferhat Çalapkulu
Sprint
ABC Connection - Nikoli
Clog The Shape - Anonymous
Digital Mess - Anonymous
Pack Up - Anonymous
Windows - Mehmet Murat Sevim
Offspring - Mehmet Murat Sevim
Yajilin - Nikoli
Rotational Sudoku - OAPC
How Many Solutions? - Anonymous
Puzzle - JPC
Fifty Fifty - Hungarian Puzzle
OpHoop - Hasan Yurtoğlu
Foton - OAPC
Gappy Skyscrapers - Anonymous
Retro Tetro - Anonymous
Hedef - Hasan Yurtoğlu
Classics
Easy As ABC - Anonymous
Star Battle - Anonymous
Equations - JPC
Ungerade Innenzahlen Rundweg - Nils Miehe
Clouds - Anonymous
2009 Domino Castle - Anonymous
Four Winds - Anonymous
Skyscrapers - Anonymous
Kropki Sudoku - Vladimir Portugalov
Hexa Fences - Anonymous
Magnets - Anonymous
Division - Anonymous
Moonstar - Anonymous
Ying Yang - Japanese Puzzle
Optimization
Operation - Ferhat Çalapkulu/Kamer Alyanakyan
Words - Anonymous
Path - Anonymous
Innovative
Diamond Islands - Hasan Yurtoğlu
Octagon Fences - Anonymous
The Persistence Of Memory - OAPC
Skyscrapers Either Or - Hasan Yaldız
First Letter - JPC
Circle Division - Hasan Yurtoğlu
LITS - Nikoli
Primesnake - Bernhard Seckinger
Hang Up - Hasan Yaldız
Common Group Max - Kamer Alyanakyan
Akkara Loop - Hasan Yurtoğlu
Stardust - JPC
Easy As Jigsaw ABC - Richard Stolk
Diagramless Kakuro - Thomas Snyder
Screen Test
Anonymous

Battleships
Puzzle: Anonymous; Puzzle Construction: Mehmet Murat Sevim
Weakest Link
False Kakuro - Japanese Puzzle; Construction: WPC 17
Domino Kakuro - Zoltan Jakabfi
Sudokuro - JPC
Dikuro - Riad Khanmagomedov
ORu Kakuro - Michael Rios
Screen Test
Anonymous/Ferhat Çalapkulu
Tapa
Serkan Yürekli
Matchmaker
Construction: OAPC
Hamle - OAPC
Islands - Nikoli
Kuromasu - Nikoli
Masyu - Nikoli
Pills Sum - Riad Khanmagomedov
Tapa - Serkan Yürekli
Tetro Minesweeper - Anonymous
Top - Heavy Number Place - JNPC
Four By Four For The Four
4x4 Minesweeper Puzzle: Anonymous;
Construction: Ali Aldaş
Black Or White Puzzles: Nikoli/ Anonymous;
Construction: OAPC
Mr. Universe Puzzles: Anonymous/Anonymous/
Serkan Yürekli/OAPC Construction: OAPC
Halflife Puzzles: Serkan Yürekli/Hungarian Puzzle/
Japanese Puzzle/Nikoli
Instructionless
Serkan Yürekli
Best Of OAPC
Sigma Snake - OAPC
Step By Step - Özgür Kişisel
Polygraph - OAPC
Slash Pack - JPC
Tripod Sudoku - OAPC
Four Squares - Aziz Ateş
±1 - Romanian Puzzle
Tapa Variations - Florian Kirch/OAPC
Magic Fence - Riad Khanmagomedov
Pentomino Kakuro - OAPC
Upgrade
Puzzle: Anonymous; Construction: Ferhat Çalapkulu
WPF
Ferhat Çalapkulu

Abbreviations:
JPC: Japan Puzzle Championship
JNPC: Japan Number Place Championship
OAPC: Oğuz Atay Puzzle Contest