THE 11TH WORLD PUZZLE
CHAMPIONSHIP & CONGRESS

Oulu 24.-29.9.2002

Instructions

Part 1

1. Word FI (nd)
15 points

The words given are hidden in the grid in 8 directions, like in a word search with overlapping letters. But beware: we treated the letter combination FI as one symbol, namely the Finnish flag ( ). We removed those flags: can you put them back in?

Example

AFIKE
HAFIFU
KOFIA
KUFIFIA
KUFIKA
OFISA
OFISI

RAFIKI
SAFINA
SAFIRA
UFIKE
UFITO
VIFIJO

		O	T		U	H
		S	E	K		A
I	O	S	A	U	K	
S	J	S	A		E	F
			U		N	U
O	I	K		A	R	A
		V		K	O		A
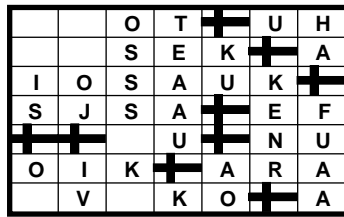
2. Houses and Trees
5 + 6 points

In each numbered square there is either a house (O) or a tree (X). The squares with no number are empty.

If a square has an X in it, the number tells you how many O's there are in 8 of its neighbor squares. If a square has an O in it, the number tells you how many X's there are in 8 of its neighbor squares. In the second puzzle, numbers have been replaced by letters A and B.
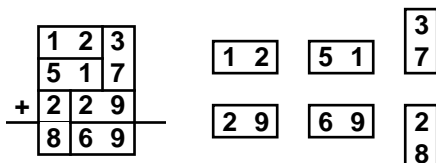
Example

		^{1}O
^{1}X	^{4}O	^{3}X
	^{3}X	^{4}X	^{2}O
	^{2}O	^{2}O	
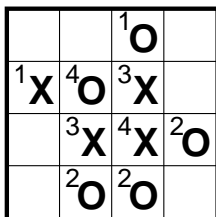
3. Dominetics
3 + 4 + 5 points

Move the pieces into the diagram to make the correct addition. Pieces may not be rotated or turned over.
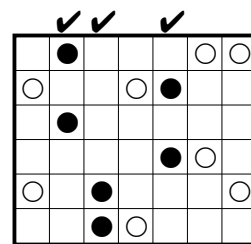
Example

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

+

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

4. Rows and Columns
7 points

Mark the three vertical columns in the grid that will produce exactly one circle in each horizontal row.

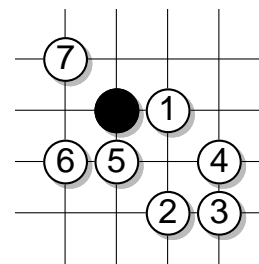**Example**

5. Hiroimono
5 points

Hiroimono ("picking up") is a puzzle on a Go board with stones.

Start at the black stone and move along the lines picking up every stone while you move. When you encounter a stone, you must pick it up, leaving its place empty.

When you pick up a stone, you may continue straight ahead or turn 90 degrees right or left. A turn of 180 degrees is not allowed. If there is no stone at the intersection – or if it has already been picked up – you may not change direction.

Place a number in sequence into each stone as you pick it up, to indicate your path.

Example

6. Fill-in Crossword
12 points

Fill the words into the grid across and down.

Example

BEI   UDI   YAO
KWA   WEE   ZAB
OGA   YAK   ZEU

Y	A	K		Z	A	B
A		W	E	E		E
O	G	A		U	D	I

7. Tangram
3 points

The figures below have been created using the given pieces. Draw the complete shape of each piece inside the outlines.

Note! The outlines have been made bigger or smaller at random so measuring exact sizes of the pieces does not work!

(no example)

8. Upright
8 points

Place numbers in the grid so that all the rows, columns and outlined areas consist of numbers 1–6.
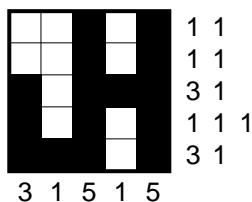
Example (with numbers 1–3):

1	3	2
2	1	3
3	2	1

9. Closed Order
8 points

This is similar to "Paint by Numbers" but you don't know the order of the clues. Each square is either black or white, and the clues show the sequences of consecutive black squares, but not necessarily in that order. Between the black sequences, there is at least one white square.
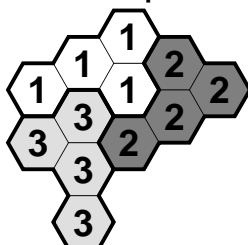
Example

				1 1
				1 1
				3 1
				1 1 1
				3 1

3 1 5 1 5

10. Hex Dissection
7 points

Divide the figure into three identical regions following the grid lines. The regions must have the same size and shape, but may be rotated and/or mirrored.
Place a 1, 2, or 3 in each cell to indicate which region it belongs to.

Example

11. Easy as 1 2 3 4
3 points

Place numbers 1–4 into each row and column. Two squares will remain empty in each row and column. Numbers at the sides tell you which number you'll encounter first.

Example

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

12. Pentamining
4 points

Divide the grid with horizontal and vertical lines into 20 contiguous blocks. Each block must have all numbers 1–5.

Example

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

13. A Closer Look
12 points

Mark the position of pieces A–L in the picture by drawing each piece's square outlines. Write the corresponding letter next to each outline.

(no example)

14. Jump Start
5 + 5 + 5 points

Try to put the given words into a 5x4 grid so that they can be spelled out as on a Boggle board. You may jump in eight directions to a neighboring square. You may use the letter in a square more than once but not before you have visited another square.

You have to put more than four words into the grid to score. Five words gets you 5 points. Adding the sixth gets you another 5 points. An empty square in your six-word solution gets you a 5 point bonus. We could not find a six-word solution in which there is more than one empty square.

Write your answer into the 5x4 solution grid and cross out the words you have used.

Example (3x3 grid)

☒ YKSI
☒ KAKSI
☐ KOLME
☒ VIISI

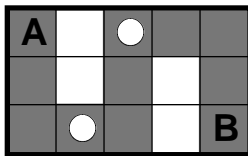| Y	K	
A	S	
I	I	V

Translation: *One, two, three, five.*

15. Take Circles
8 points

Find a path from the top left corner (A) to the bottom right (B) so that you pass through every circle once. The path may not touch itself, not even diagonally.
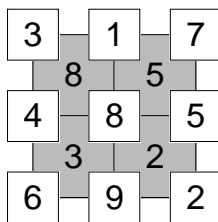
Example

16. Square Numbers
3 + 5 points

Place numbers 1–9 into the white squares so that the numbers in the gray squares indicate the difference between the sum of the numbers in the two corners above each gray square and the two corners below it.

Example

17. Different Dominoes
8 points

A special domino set of 16 pieces is placed in the diagram. Draw the sides in the diagram so that the position of each domino piece can be seen.
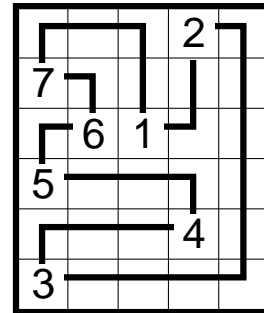
(no example)

18. One2seven
7 points

Make a continuous loop that travels in numerical order from 1 to 7. Number 7 is followed by number 1. You may move vertically or horizontally, but not diagonally. Each square must be visited exactly once. The loop may not cross over itself.

Example

19. Patchwork Quilt
15 points

Find a path from left to right by moving from one colored block to another. The colors in your path must be a repeated sequence of three colors, e.g., RED–GREEN–BLUE–RED–GREEN–BLUE–...

Your path must end on the third color of the sequence.

(no example)

(Black and white version of the previous page.)
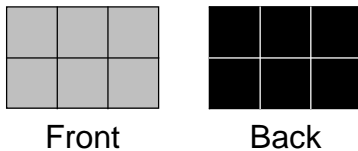
end of part 1

Part 2

Competitors do not need to cut any pieces.

1. Two-Piece Folding Puzzle
5 points

Fold the given two pieces along the lines and put them together to make a rectangle of 2x3 squares. One side of the rectangle should be black and the other side gray.

The figure below shows the result of the folding, not the two pieces.
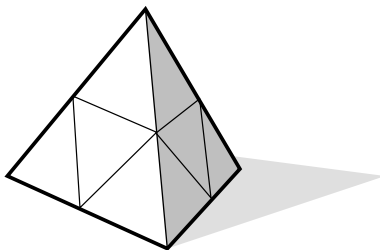
Front   Back

(no example)

Gray square on the other side.
Cut off the center
Piece 1
Piece 2

2. Pyramid Folding
5 points

Fold along the thin lines and make a 3-dimensional four-sided pyramid (tetrahedron).
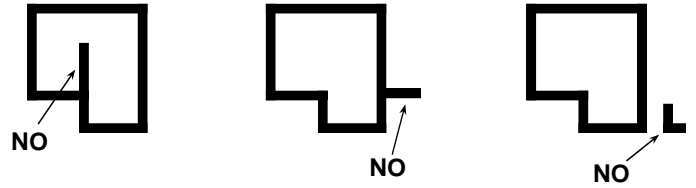
(no example)

(Cut along the dotted lines.)

3. Hole Loop
15 (5) points

Form a continuous loop made of the thick line parts of the pieces. The loop must consist of line parts from every piece. Line parts that are not part of the loop may not be seen in the solution.

You may not fold the pieces.

You may ask for a hint but then you can score only 5 points.

NO   NO   NO

(no example)

(Cut along the thin lines. Cut the gray 1x1 areas off.)

4. Tower of Oulu
5 points

Using a set of building blocks, construct the Tower of Oulu so that the word OULU can be read exactly four times. We will show you the outline (structure) of the Tower of Oulu and tell you the allowed directions of the word OULU.

(no example)

Tower of Oulu

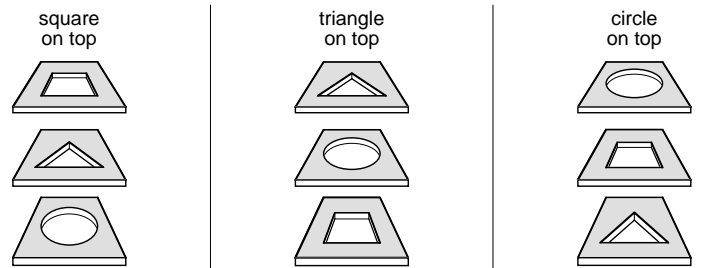**Allowed directions of the word OULU**
DOWN
ACROSS
UPSIDE ACROSS
UPSIDE DOWN

5. Three-Level Stack
10 points

Stack the given pieces in 3 levels on a 3x3 grid. Pieces may be rotated but **NOT** turned over.

A square can only be on top of a triangle.
A triangle can only be on top of a circle.
A circle can only be on top of a square.

square on top   triangle on top   circle on top

(no example)

(Cut along the thin lines.)

6. Twelve-Face Cube
5 points

Arrange 8 small cubes to form a big cube (2x2x2) so that on all its six faces, there is a complete picture made of four parts.

When you cut the big cube in top and bottom halves, you must see two more pictures. When you cut the big cube vertically, you must see yet another two pictures. Note that there are two ways to cut the cube vertically.

So in total, there are twelve pictures in the big cube, six outside and the other six inside the cube. You will be shown the 12 pictures before you start.
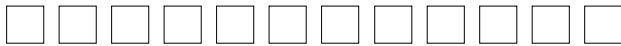
2x2x2 cube
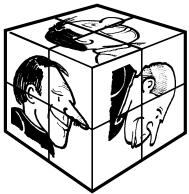
2x2x2 cube
cut in half
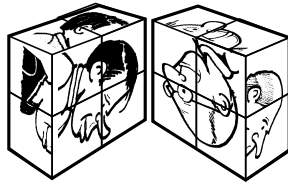
(no example)

The 12 pictures found in the 2x2x2 cube

The eight cubes (opened)

7. Multi-Level Graph
**20 (10) (5) points**

Put the transparent pieces on top of each other to form a graph so that all white dots are connected with black lines. The lines may not overlap. There may not be loops in the graph. The solution is a tree structure with 25 white dots and 24 connecting black lines.

The pieces may be rotated 90, 180, or 270 degrees and turned over. The square outlines of the pieces must be aligned (on top of each other).

Two hints are available. If you ask for the first, you can get only 10 points. If you then ask for the second, you can get only 5 points.

A line connecting two white circles:

Example
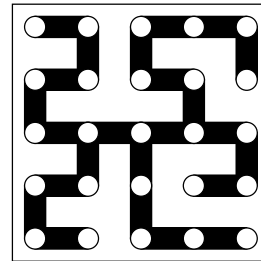
Piece 1 A
Piece 2 A
...
etc.

end of part 2

Part 3

1. Moving Battleships
20 x 1 point/ship

A fleet of ships is located in a grid. After a while, the ships have moved 3 units forward or backward. Submarines (1-unit ships) may have moved sideways, too. Diagonal moves were not allowed.

The numbers outside the grids indicate how many squares are occupied in each row and column. The ships do not touch each other, not even diagonally. (While moving, they may touch.)

Draw the initial position of the ships in grid A and the final position in grid B.

Example



A   **B**

2. Changing Block Maze
1 point for each correct number *from the start*

Move a 1x2 block through the maze. When moving the block, you may not change the orientation of the block but must move it either a) forward or b) sideways.

Moving   Moving

Every time the block passes through a numbered 2x2 cell, it changes shape from 1x2 to 2x1 (or vice versa). When you enter a cell from one side, you must exit it through a different side.

Passing through a numbered square
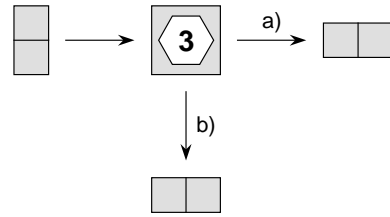
You may pass through the same cell more than once but you may not re-enter it before first passing through another cell. You do not have to pass through every cell. One-way paths are marked with arrows. Enter and exit points are indicated by arrows.

Show your path by entering the cell numbers in the order you pass through them.

3. Cornering Ability
25 points

This crisscross is like a regular crisscross except that either the first or last letter of each entry must go around the corner to make the words fit, thus:

Possible orientations of the word SAMPLE
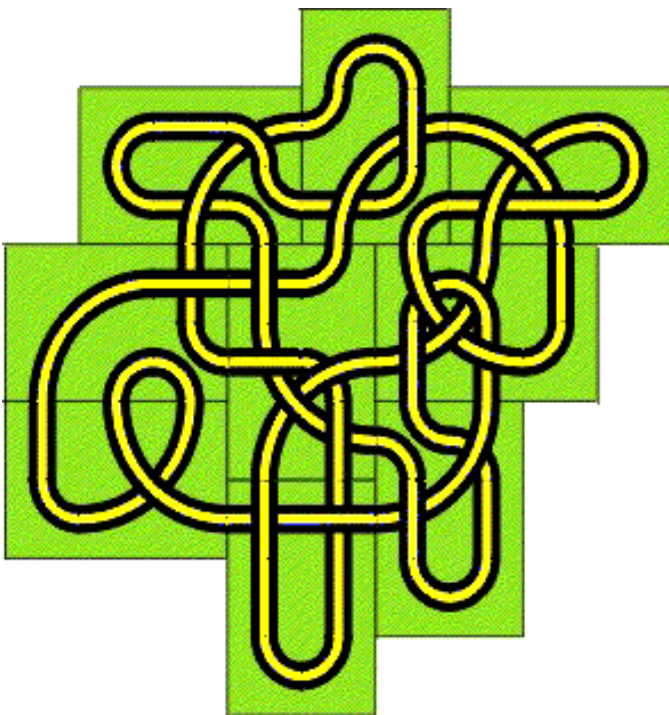

end of part 3

Part 4

1. Celtic Knots

A Celtic knot is a single continuous loop that threads over and under itself alternately.

Make three Celtic knots of 18 pieces so that every piece in one knot has different background color. The knots must be made of 5, 6, and 7 pieces.
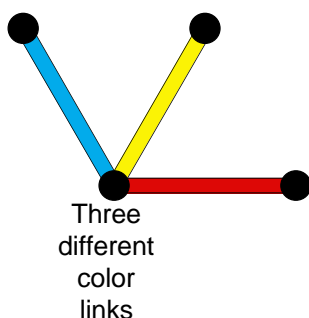
**Example knot with 9 pieces
(same background color)**

2. Tri-Lines

There are 17 black circles. Connect 14 of them so that each circle is connected to three other circles with three links of different colors. The links may not cross each other. Three circles are not connected to any other circles.

Example
(not complete)

Three
different
color
links

3. OULU Blocks

Arrange 13 cubes on a 4x4 board so that the word OULU can be read five times: once from the top and once from each of the 4 sides.

The letters of OULU must be on a straight horizontal line and no extra letters may be seen.

Cubes can be put one over each other.

O U L U

Correct

O U L U   O   L U
      U   U

Incorrect   Incorrect
(extra letter)   (not on a straight line)

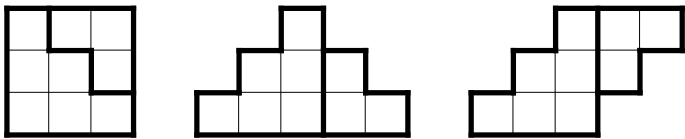**(A complete example will be shown.)**

end of part 3

Part 5

1. Pieceful
6 points

Add division lines to a grid to make five pieces. The pieces you create must fit into every other grid. Add the division lines to other grids, too. The pieces may be rotated and mirrored.

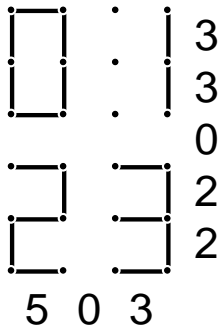**Example (three grids divided into two pieces)**

2. Dig It?
8 points

Place nine of ten digits in the grid. One digit must be left out. The digits cannot touch each other, and cannot be mirrored or rotated. Numbers show how many lines you'll encounter in rows and columns.

Example (with 0–3) and sample digits

$$3$$
$$3$$
$$0$$
$$2$$
$$2$$
$$5 \quad 0 \quad 3$$

3. Put Numbers
5 points

Put the given number pairs into the grid (one digit in each square) in such a way that in each marked area, all squares have the same digit.

Example

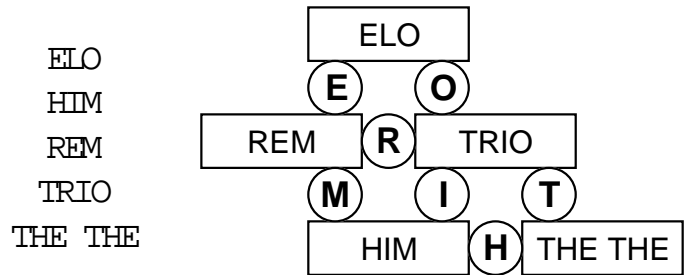| 4 | 4 | 4 | 5 | | 2 1 | 4 1 |
4	1	3	5		2 6	4 4
2	1	3	6		3 5	4 5
2	6	6	6		3 6	6 6

4. Band It
15 points

Insert the given names of music bands and artists into rectangles of the graph. Into each circle connecting two rectangles, put one letter or number that is common to the names on either side of it.

All circles connected to one rectangle must have different letter or number.

Example

ELO
HIM
REM
TRIO
THE THE

5. Elastic Bands
5 points

Twelve pegs are placed in a circle like the numbers on a clock. The pegs are connected to each other with elastic bands. When you move a peg, the bands that are connected to it stretch or shrink depending on where the other end is connected.

Figure A shows the initial positions of the pegs and their connections. After moving some or all pegs to a new position, the elastic band network looked like figure B. We then removed the numbers from the pegs in figure B. Put the numbers back.

Example (with 6 pegs; numbers have been put back)
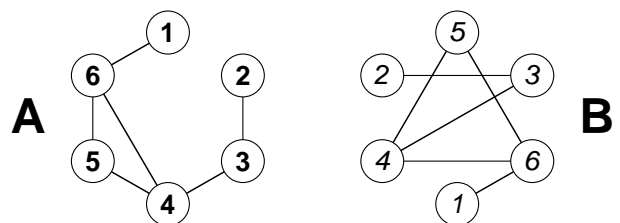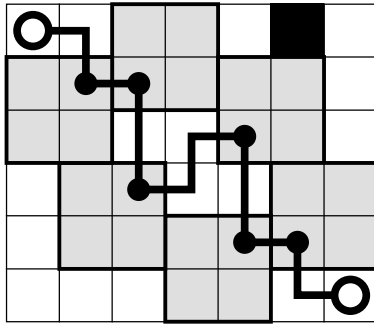
6. Pass Squares
4 points

Connect the two white circles with a line that passes throught exactly one cell of each gray 2x2 square.

You may move only horizontally or vertically. The path may not touch (or cross) itself, nor pass through a black square.
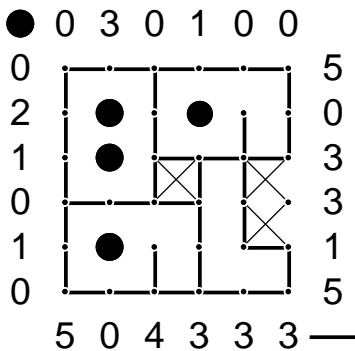
7. Big Figures
12 points

Place all the given digits in the grid. You may rotate but not mirror them. The numbers on top and on the left show the number of "black holes" in each row and column. The numbers at the bottom and on the right show the number of lines in each row and column.
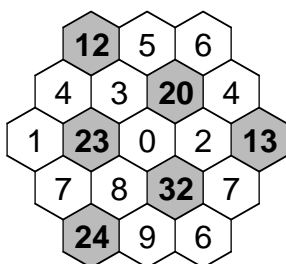
Example (with 6–9) and sample digits

8. Hexum
10 points

Fill empty cells with digits from 0 to 9. The number in a clue cell must be the sum of digits surrounding it. The digits around a clue cell must all be different.

Example

9. Black Spot Maze
6 points

Enter the maze and continue straight ahead. You may not turn unless you reach a black spot or hit a wall, and then you must turn 90 degrees to the left or to the right. No other turns are allowed.

Find your way through the maze to the exit so that you encounter every black spot at least once. If you encounter black spots more than the minimum, you lose one point for each additional spot. Enter and exit points are indicated by arrows.
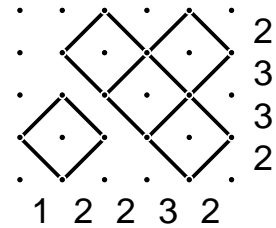
(no example)

10. Skewer
9 points

Place "diamonds" (squares that have been rotated 45 degrees) in the grid. The numbers show how many half-diamonds are found in each row and column.

Example

11. Krypto
15 points

Krypto is a crossword puzzle that uses a basic form of encryption in which each letter of the solution is replaced by a number.

In our Krypto, there are 46 words and 24 different letters are used. Ten of the words are: APOLO, JAMBO, KWAKO, MTAWAUA, NACHO, NATOA, NYAVU, PANGU, SHUJAA, and WACHA.

Letter D is used in 3 words.
Letter R is used in 5 words.
Letter Z is used one more time than letter F.
Letter A and letter I are both missing from only 2 words.

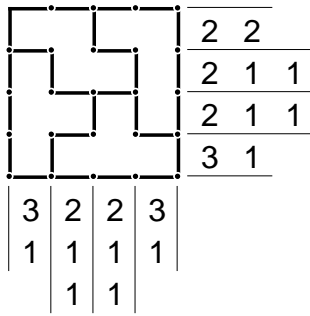Solve the Krypto and write your decryption key.

12. All Fours
6 points

Divide the grid into adjacent blocks of four squares. Numbers tell you how many parts of blocks there are in each row and column, but not necessarily in the correct order.

13. Number Tables
5 + 5 points

Divide each row of digits into three numbers and place them into the grid so that every digit is part of one vertical and one horizontal number.

Example

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

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

14. Foursome
10 points

Divide the grid into adjacent blocks of four squares so that each square in a block contains the same number chosen from 1–4. A block cannot touch another block with the same number, not even diagonally. Clues show the sums of numbers in rows and columns, and the number of blocks encountered.
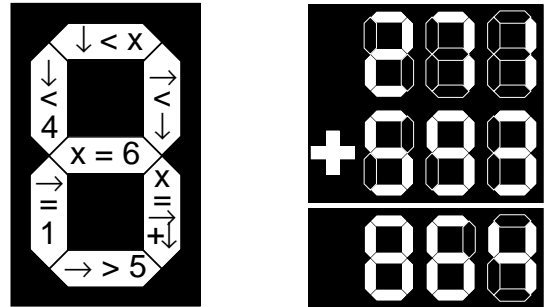
Example

15. Digital Calculation
15 points

Solve the digital calculation by blackening the segments with an incorrect proposition.

- x   refers to the digit itself
- ↓   refers to the digit below x
- ←   refers to the digit to the left of x
- ↑   refers to the digit above x
- →   refers to the digit to the right of x

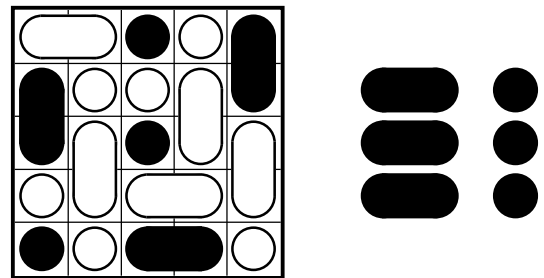**Example (and sample digits, except zero)**

16. Retrigrade Battleships
10 points

In this variation of the Battleship puzzle, possible positions of the ships are given. Find the position of the ships in the grid. Ships do not touch each other, not even diagonally.

Example

17. Scrambled
2 points

Put the pictures of the cartoon in correct order.

(no example)

end of part 5

Part 6

1. Criss-Cross

Construct a criss-cross puzzle with the given words using standard crossword rules. The goal is to get as many crossing letters as possible.

If two letters are in adjacent cells, they must be part of the same word. All words in the grid must be connected to each other.

points = (2 × C) – W, where

    C = number of crossing letters
    W = number of words in the grid

(no example)

2. Number Crunching

You are walking on a grid and picking up numbers from the cells. When you pick up a number, the cell becomes empty. You may select your starting cell and first step as you wish, but after the start your path depends on the numbers in the grid:

- if the number in the cell is **negative** (< 0), you walk to the **left**
- if the number in the cell is **positive** (> 0), you walk to the **right**
- if the cell is **empty**, you **jump** to some other (non-empty) cell and start again. You can only jump once.

Your score is the sum of all numbers you pick up.

Example (without the jump)
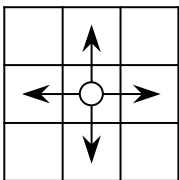
neighbors   start ← (WEST)

1	-2	3	2	1
-1	1	2	-1	-1
-1	2	1	-2	1
-3	-1	-2	1	-3

1–1–1+2–1–2+1–2–1+2+3+2 = 3 points
(WEST–left–left–right–left–left–right–left–left–right–right–right)

Mark clearly your starting cell, the direction of the first step (with an arrow), the cell where you jumped and your new direction (with an arrow).

----
neighbors   start ↓ (SOUTH)
1+3+2-1 = 5 points
(SOUTH–right–right–left)

3. Battle Ships

Put battleships in a given grid to get the maximum amount of points. The ships cannot touch each other, not even diagonally.

Each kind of battleship has its own point value. We will tell the values when you start.

Your points depend on the best score. We will subtract **X** points from the best score to give the best solver(s) 20 points. We then subtract that same **X** from every other score. If you score is $\leq$ **X**, you get zero points (i.e., not negative points).
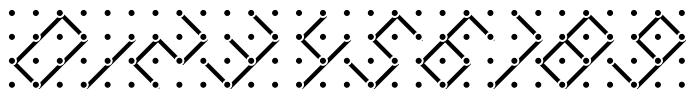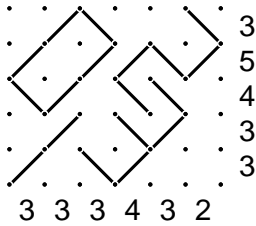
(no example)

---

end of part 6

Part 7

1. Lopsided
25 points

Place the given digits, except one of them, in the grid. Digits cannot touch each other, and cannot be rotated or mirrored. Numbers show how many lines you'll encounter in each row and column.
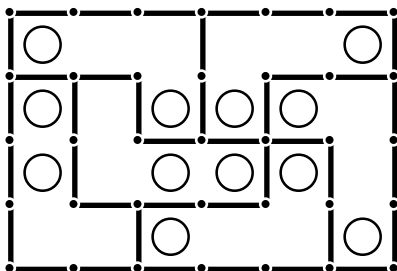
Example (with 0–3) and sample digits

2. Circular Reasoning
14 points

Divide the grid into L-shaped pieces of the same size so that each piece contains exactly two white circles.
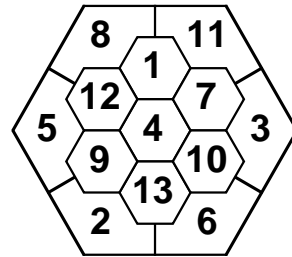
Example

3. Honeycomb Numbers
6 + 8 points

Place numbers 1–13 into the cells so that the difference between neighboring numbers is ≥ 3 (greater than or equal to 3).

Example

4. @ Crossword
15 points

Fill the grid with words reading across and down, crossword-style. When you are finished, all of the squares in the grid should contain a letter. Words will never overlap, but of course they will intersect. Every word intersects with at least two other words.

After you place the crossing pairs into the grid, add a bar at the start and end of each word unless they fall at the edge of the grid (see example). Some letters will be part of only an across word or a down word. The words are listed in crossing pairs below, separated by an @ sign. The across word is always listed first. All G's and M's have already been placed into the grid.

Example (5x5 diagram)
[The circles indicate where the two "@words" cross.]
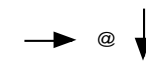
ARENA @ PSALM
FERAL @ SHAFT
HYPES @ TYRE
STOP @ OPERA
PALM @ PENAL
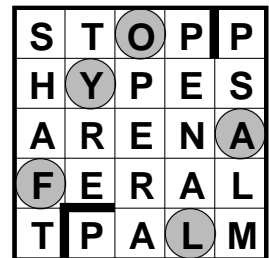
5. Fragments
11 points

Place the pieces into the grid to make one black and one white area of squares. Do not rotate the pieces.

Example

6. Six-packs
10 points

Put groups of six beverage cans in the grid. Groups cannot touch each other. Numbers at the sides tell how many cans you'll encounter in the direction of the arrow.

Example

7. Hex by Numbers
6 points

The numbers at the sides of the hexagonal grid tell the length of the first sequence of consecutive black hexagons in each direction.

Black in the cells to make the numbers correct.

Example

8. Black-Out Math
8 x 1 points

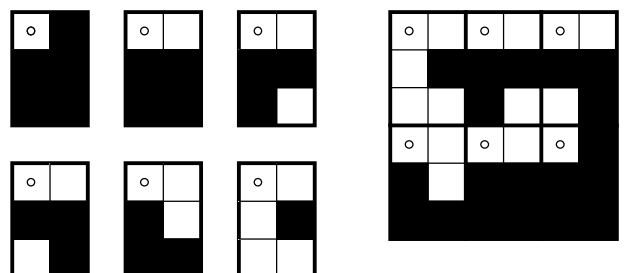In each row, paint two cells black to make the equation correct. Standard algebra rules are followed, so multiplication (x) and division (/) go before addition (+) and subtraction (−). Also, operations between brackets go first.

Example

12 + 24 = 36

9. Crossword Pieces
15 points

Two crossword puzzle solutions have been cut into pieces and scrambled. The words in both puzzles are exactly the same. Put the solutions back together.

Example

10. Sequence 1–7
10 points

Which figure (A–G) is missing from square 7? The first square is logically followed by the second, third, fourth, etc. So, the squares form a linear sequence, not two or more interlaced subsequences.

Why did you make your selection? Explain it to us, but do not do it in writing. Draw your reasoning in a way that practically anybody (over 10 years) can understand – otherwise you do not score any points.

(no example)

11. Match Maker
10 points

Make seven pairs of the 14 cards so that each pair has one symbol in common. There are no two cards with more than one symbol in common.

(no example)

## end of part 7

Part 8

1. Making Faces

There are 48 different faces. Most of them appear three times but a few only twice. Each face is numbered. Tell us the numbers of the faces that appear only twice.
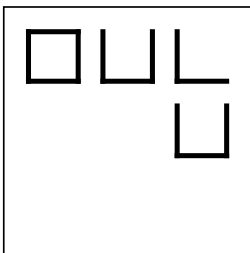
(no example)

2. OULU-tronic

OULU-tronic is an electronic game with a display and four buttons to change the display. The goal is to get as many OULU's as possible on the display. The word OULU must be read at least from two directions.
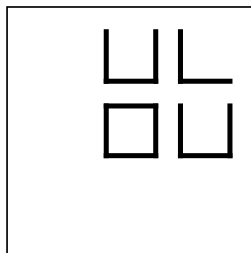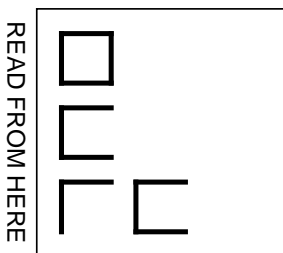
Example
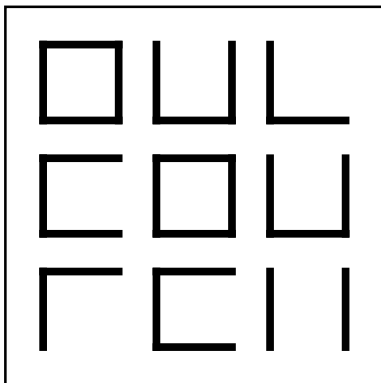
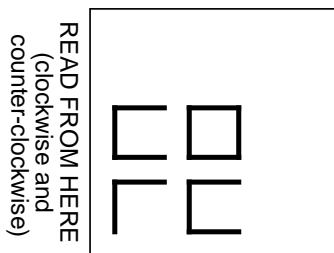**Three OULU's can be read from the front**

READ FROM HERE

READ FROM HERE
(clockwise and
counter-clockwise)

READ FROM HERE

READ FROM HERE
(clockwise and
counter-clockwise)

Three OULU's can be read from the left

3. Color Paint-by-Numbers

The numbers tell the length of consecutive colored cells on rows and columns. If two sets of the same color are in succession, at least one white cell must separate them.

Put the pieces in correct places to reveal the picture.

(no example)

end of part 8

Rules of the Final Round

The 3 contestants with the highest scores from the first two days of competition will compete in a playoff round to determine their final ranking.

The playoff will consist of 10 puzzles. The instructions for them will be distributed an hour before the playoff begins.

The contestant in 1st place after the initial rounds will have 30 minutes to solve the puzzles. The contestants in 2nd and 3rd places will each have proportionately less time to solve based on their scores on the initial rounds. For example, if the contestant in 3rd place has 5% fewer points than the contestant in 1st place, then the 3rd contestant will have 5% less time than the 1st contestant to solve the playoff puzzles.

The diagrams and art for 9 of the 10 playoff puzzles will be presented on large sheets of paper for the audience to see. The contestants will mark their solutions on the sheets. When a contestant finishes a puzzle, the contestant will hand the sheet to an official, who will record the contestant's time and take the sheet to the judges.

The 10th puzzle is a mechanical puzzle. When a contestant finishes it, the contestant will hand the solved puzzle to an official.

The puzzles can be solved in any order. All parts of the solution must be filled in and accurate to be considered correct.

Once a solution has been handed to an official, it cannot be changed.

The playoff contestants will wear headphones to block outside noises. The contestants must not look at another person's solutions or receive help of any kind.

Final ranking of the playoff contestants will be based on their accuracy in the playoff round, starting with the person who correctly solves the most puzzles. Ties, if any, will be broken by time, starting with the person whose last correct solution is the earliest.

Final

1. Alternate Corners

Find a path that passes through every square exactly once, ends in the same square in which it begins, and never crosses itself. The path travels horizontally and vertically, but never diagonally. Every second turn in the path will be in a square containing a circle, and every square containing a circle will have a turn.

2. Digititis

Complete this long division problem correctly by inserting numbers into the empty squares. No number starts with a zero.

3. Easy as 1234

Place the digits 1 through 4 in the diagram so that every number appears exactly once in each row and column. (Two of the squares in each row and column will remain blank.) The numbers around the edge of the diagram indicate the nearest number to the edge in that respective row or column.

4. Hex Loops

Find a path that travels from hexagon to adjoining hexagon, ends where it starts, and never touches or crosses itself. The path may not make a "sharp" turn of 60°. The numbers placed in some of the hexagons indicate the number of adjacent hexagons through which the path passes. The path cannot pass through a numbered hexagon.

5. Cross Sums

Enter a digit (from 1 to 9) in each white square so the sum of the digits in each Across answer equals the value given to the left, and the sum of the digits in each Down answer equals the value given above. No digit is repeated within a single answer.

6. Animal Search

Fifteen of the following 16 animal names (in Swahili) can be found in the word search grid. Circle their letters. Which name is left over?

7. Crisscross

Fit these 32 five-letter Swahili words in the crisscross grid reading across and down. To help you, the Across and Down words have been listed separately.

8. Battleships

Locate the position of the 10-ship fleet in the grid. The fleet, as shown, consists of: one battleship (four cells), two cruisers (three cells), three destroyers (two cells), and four submarines (one cell). Each segment of a ship occupies a single cell. Ships are oriented either horizontally or vertically. Ships do not touch each other, not even diagonally. The numbers along the bottom and right edges of the grid indicate the total number of ship segments that appear in the respective columns and rows. Cells with water (indicated by lines) do not contain ships.
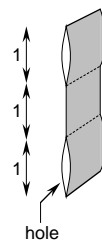
9. Ice Fishing

One of these 16 pictures (A to P) is an original drawing, in which one change was made to produce each of the other 15 pictures. Circle the 15 changes and identify the original drawing.
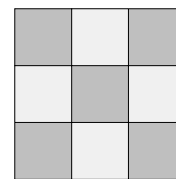
10. Ribbons

Slide six ribbons through each other to form a checkered 3x3 grid so that **both** sides are identical.

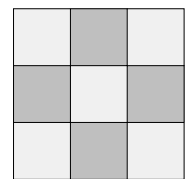(The ribbons are quite rigid and do not bend much.)

sample ribbon

both sides look like this **or** both sides look like this

1

1

1

hole

end of final