Argentine Puzzle Championship

Final Test

Buenos Aires, July 5, 2000

http://www.geocities.com/campeonatodeingenio

English version by Wei-Hwa Huang

Welcome

(The actual test on July 5th had 129 participants. The following text appeared on the cover of their tests.)

This test consists of two parts. The first part will take 2 hours; the second will take 20 minutes. Write your name on this page immediately. Once you are told to start, open the packet and put your name on every page, as well on the Solution Sheet. There will probably be more problems than you can solve, so don't worry if you can't solve all of them in the amount of time given.
Questions about the puzzles will not be answered. If there are any problems with the testing conditions, raise your hand to get a judge's attention, and they will take care of it. Once the testing time is over, immediately stop all writing. Turn in your Solution Sheet. The rest (including the pages with the puzzles and any scratch paper you have) you may keep as a memento.

The second part of the test will be a single puzzle, given out after the first part of the test is over. The competition is individual; communication of information between participants is not allowed. The judges reserve the right to disqualify any participant if they determine that the participant did not follow these rules or any action that harms the conditions of the test.

Points
Each puzzle in the first part has a point value for a completely correct answer. A puzzle with a wrong answer will deduct five points from the participant's score. Unanswered puzzles will neither add nor subtract points.
The second part will be scored according to how well the participant does, which will be explained in due course.

Results
The correct answers and the list of the top ten scores and participants will be posted within the next ten days.

Puzzle Credits

1. Intercross	Jaime Poniachik.
2. Square Division	Ivan Skvarca.
3. Overlapping Pages	Ivan Skvarca.
4. Houses and Trees	Jaime Poniachik.
5. Skeleton Calculation	Jaime Poniachik.
6. Another Skeleton Calculation	Jaime Poniachik.
7. Square Fences	Ivan Skvarca.
8. Round-Robin	Ivan Skvarca.
9. Another Round-Robin	Ivan Skvarca.
10. Pillars	Ivan Skvarca.
11. Domino Path	Marcelo Iglesias.
12. Skyscrapers	Jaime Poniachik.
13. Sphinx Cut	Jaime Poniachik.
14. Anubis in Two	Ivan Skvarca.
15. Battledice	Ivan Skvarca.
16. Battleships	Jaime Poniachik.
17. Battleships with Mines	Marcelo Iglesias.
18. Cards	Ivan Skvarca.
19. The Postman	Ivan Skvarca.
20. The Necktie	Jaime Poniachik.
21. Straight Rays	Lea Gorodisky.
Ecosystem	Jaime Poniachik / Ivan Skvarca.

Part One

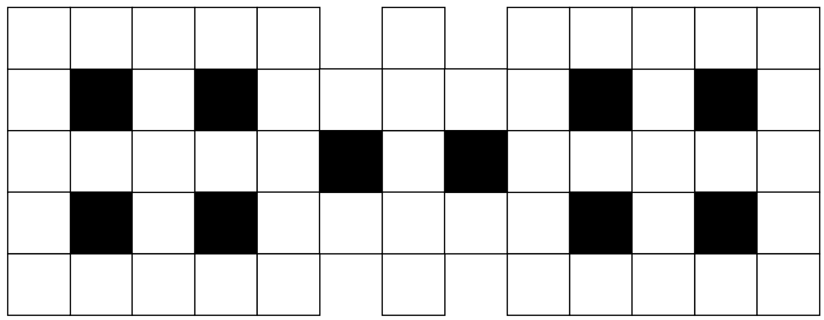
Two hours

1. Intercross

10 points

Put the fifteen words from the word list into the diagram. The horizontal words must go from left to right, and the vertical words must go from top to bottom.

ABREN
ANDEN
AREAS
ARNES
BROMO
COREA
CUECA
ENTRE
EVADE
PARIS
PLATA
POLAR
RADAR
RATAN
SANAN

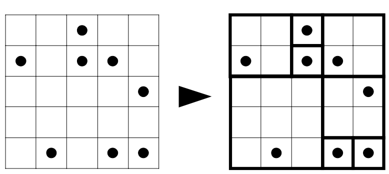


Solution Key: *Enter the words into the diagram.*

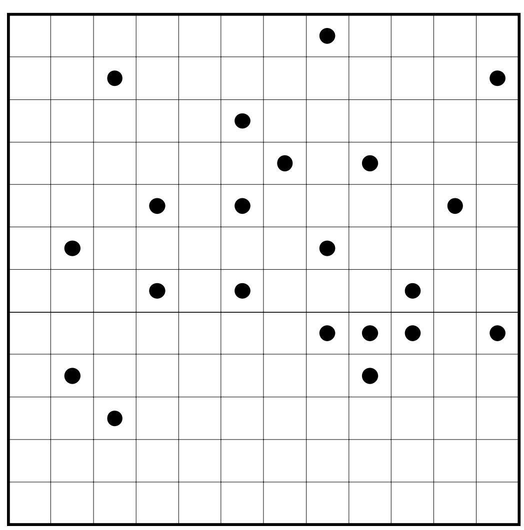
2. Square Division

10 points

Divide the grid into squares so that each square has exactly one dot. The squares must be whole squares and cannot overlap. The entire grid must be used.

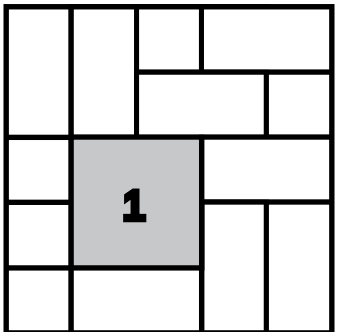


Example, on a smaller grid.



Solution Key: Divide the grid.

3. Overlapping Pages
5 points

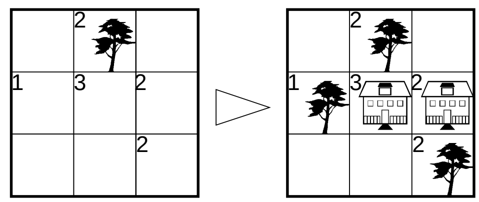


Fourteen sheets of paper were piled up on the table, all opaque squares of equal size. The sheet labeled "1" is on top. Number the others, from the top sheet to the bottom sheet (with the numbers 2 to 14).

Solution Key: *Complete the diagram with the numbers.*

4. Houses and Trees
15+15 points

Detemine the locations of houses and trees in each grid. Each square that contains a number contains a house or a tree. Each square that does not contain a number does not contain a house nor a tree. In each square where there is a house, the number indicates how many trees are adjacent to it; and in each square where there is a tree, the number indicates how many houses are adjacent to it. Two squares are adjacent if they touch horizontally, vertically, or diagonally. In each puzzle one house or tree has been located for you.



A. 15 points

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

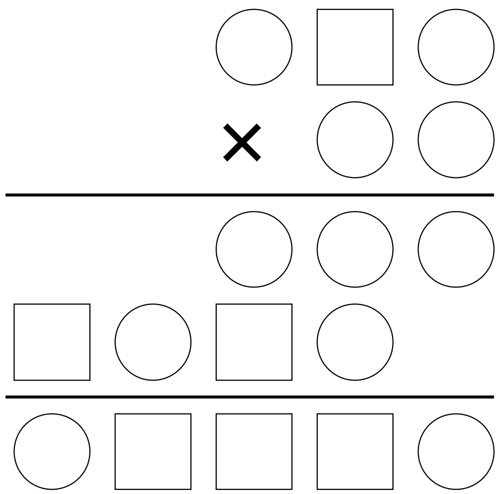
B. 15 points

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

Solution Key: *Mark the squares that contain trees.*

5. Skeleton Calculation
15 points

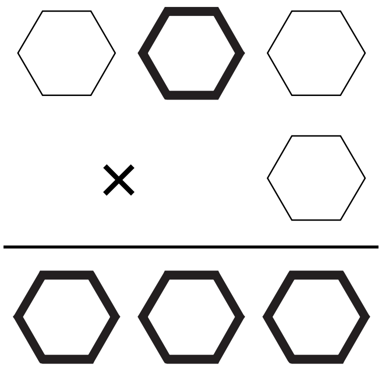
Reconstruct the multiplication by putting an even digit (0, 2, 4, 6, or 8) in each square and an odd digit (1, 3, 5, 7, or 9) in each circle. No number begins with 0.



Solution Key: *Just write down both multiplicands.*

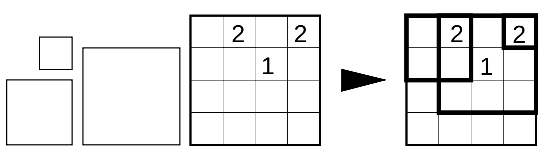
6. Another Skeleton Calculation
10 points

Reconstruct the multiplication. The four highlighted cells contain the same digit, which does not appear anywhere else in the multiplication. No other information about the other cells is needed. No number begins with 0.



Solution Key: *Just write down both multiplicands.*

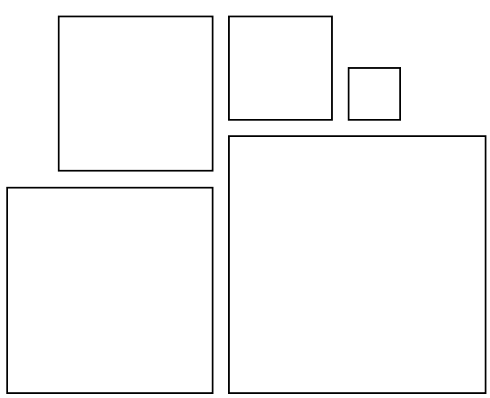
7. Square Fences
5 points

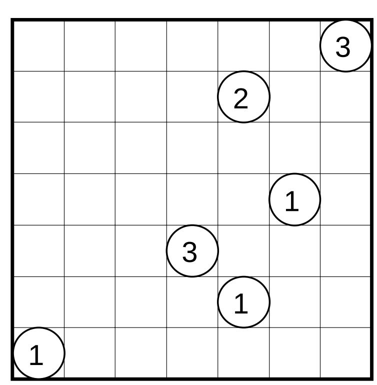


Example, with a smaller grid.

Draw five square along the lines of the grid: one 1x1, one 2x2, one 3x3, one 4x4, and one 5x5. Some squares contain numbers; the number indicates how many squares contain that number.

Solution Key: *Draw the squares in the grid.*





8. Round-Robin

10 points

Four teams compete in a round-robin soccer match, where each team plays one game against each other team. The team that wins a game gets 3 points. If a game is tied, each of the two teams gets one point. This table shows the final statistics of the match. Deduce the results of each game.

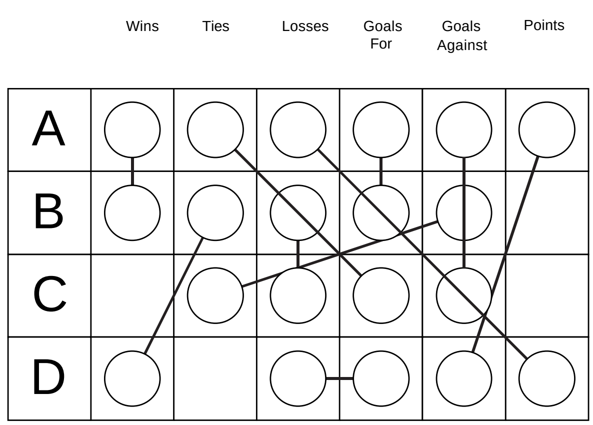
	Wins	Ties	Losses	Goals For	Goals Against	Points
A	2	1	0	5	2	7
B	1	2	0	3	0	5
C	1	0	2	2	4	3
D	0	1	2	2	6	1

Solution Key: *Write down the results of each game.*

9. Another Round-Robin

15 points

Four teams compete in a round-robin soccer match, where each team plays one game against each other team. The team that wins a game gets 3 points. If a game is tied, each of the two teams gets one point. This table shows the final statistics of the match. Team A is in first place, team B is in second, and so on. Place order is determined by how many points; if two teams have the same number of points, place order is determined by the difference of the team's goals for and goals against. In this puzzle, cells that have a line drawn between them contain the same number. (For some cells, no information is given.) Deduce the results of each game.

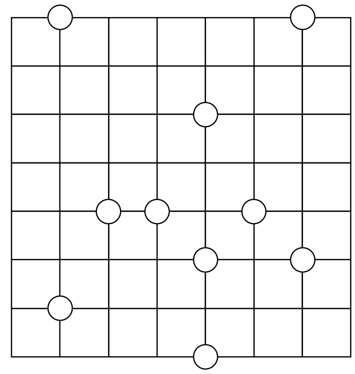


Solution Key: *Write down the results of each game.*

10. Pillars

10 points

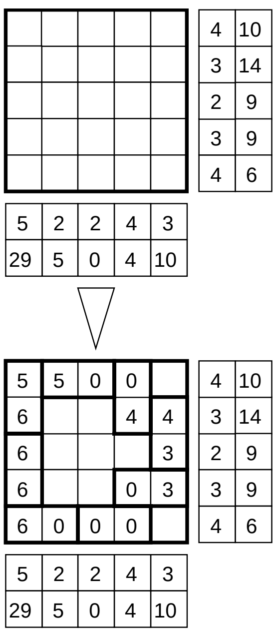
There are round pillars on some intersections in this grid, represented by circles. On one of the empty intersections there is an observer who can only see five pillars. Where is he?



Solution Key: *Mark the location of the observer.*

11. Domino Path

15 points



Example, on a smaller grid.

Some dominoes from a normal set of 28 (double-six) dominoes were taken and placed in the grid, forming a closed path and following the normal domino rules for touching (two dominoes can only touch at the same number). The empty grid below has two numbers for each row and column. The normal numbers indicate how many squares in that row or column are occupied. The **boldface** numbers indicate the sum of the domino numbers in that row or column. Determine the placement of the dominoes.

⇨									4	**8**
									5	**14**
⇨									3	**7**
									2	**3**
⇨									2	**6**
									2	**6**
⇨									7	**27**
									3	**5**
	6	2	2	4	2	3	4	5		
	3	**3**	**9**	**9**	**0**	**14**	**16**	**22**		

Solution Key: *Write down the numbers in the rows indicated by the arrows, from left to right and ignoring any empty spaces. In the example, the first row would be 5500 and the second would be 644.*

12. Skyscrapers

10+15 points

Each grid represents an array of square-based buildings. In each line (rows and columns) the buildings are all of different height (1 to 5 floors in the first puzzle; 1 to 6 floors in the second). The numbers along the edge of the grid indicate how many buildings are visible in that line from that direction. An example has been provided for clarity.

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

Example, on a smaller grid.

A. 10 points

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

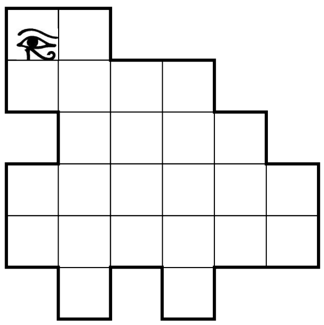
B. 15 points

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

Solution Key: *Locate the buildings of height 1 on the board.*

13. Sphinx Cut
10 points

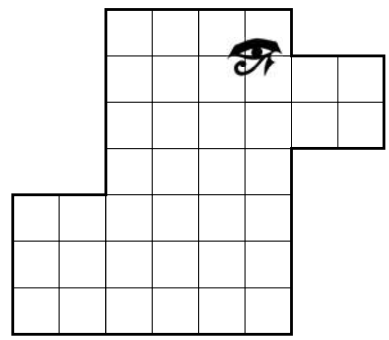
Divide the sphinx into three identical regions. The division lines will be aligned with the grid. The eye is only for cosmetic purposes. Two regions are considered identical if they can be superimposed by translation, rotation, and/or reflection.



Solution Key: *Divide the diagram.*

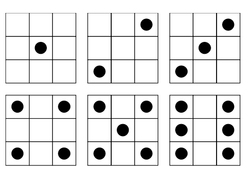
14. Anubis in Two
20 points

Divide the figure into two identical regions. The division lines will be aligned with the grid. The eye is only for cosmetic purposes. Two regions are considered identical if they can be superimposed by translation, rotation, and/or reflection.



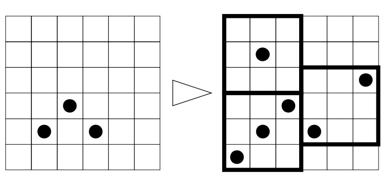
Solution Key: *Divide the diagram.*

15. Battledice
10 points

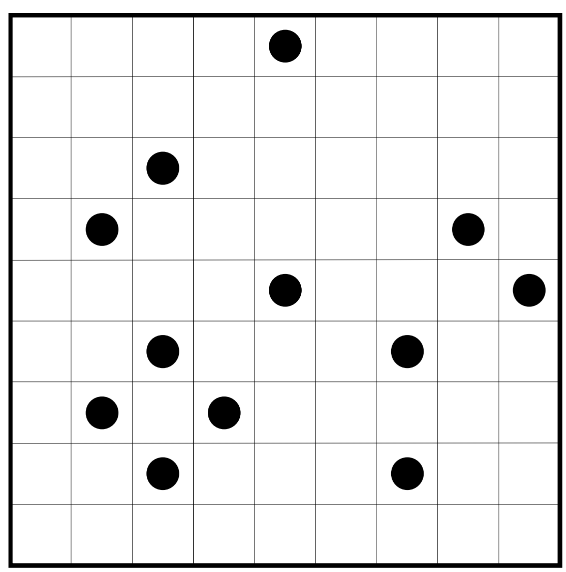


Numbers from 1 to 6, as seen on the face of a die.

The grid contains the numbers 1 through 6 as seen on the faces of a die. Each one occupies a three by three square. Faces are never superimposed on other faces. Locate where each face is. Only some of the pips are located for you, and every pip given is part of some face.



Example for a grid with only numbers 1, 2, and 3.

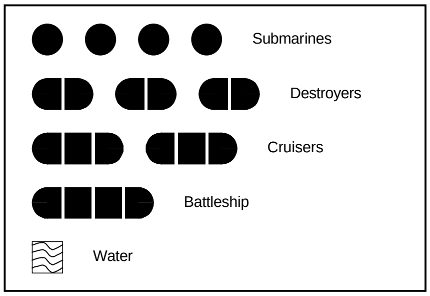


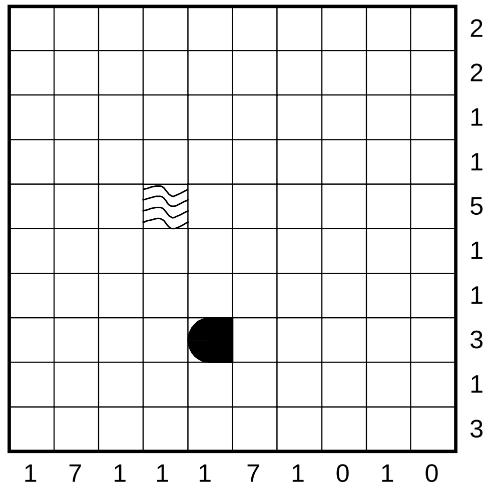
Solution Key: *Divide the grid.*

16. Battleships

15 points

Determine the location of the naval fleet (ten boats) in the grid. Each number indicates how many squares are occupied in the corresponding row or column. Two boats never occupy adjacent squares, not even diagonally adjacent squares.



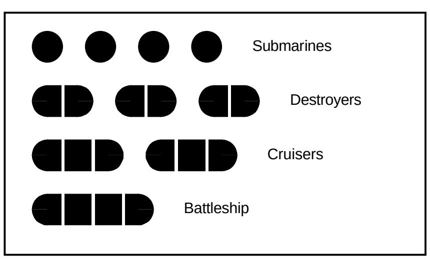


Solution Key: *Mark the location of the entire fleet.*

17. Battleships with Mines

15 points

Determine the location of the naval fleet (ten boats) in the grid. Each numbered square indicates how many adjacent (horizontally, vertically, or diagonally) squares are occupied by the fleet. No boat will occupy a numbered square. Two boats never occupy adjacent squares, not even diagonally adjacent squares.



					3		3		
		6	5						
							4	2	2
		4							
						3			
0		2							
			4		5				
					3				
		0							

Solution Key: *Mark the location of the entire fleet.*

18. Cards

20 points

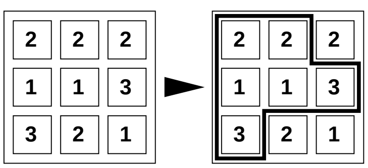
Cards 1, 2, 3, and 4 are white; cards 5, 6, 7, and 8 are black. Put the cards in order from first to last so that all the statements are true.

1 *The next two cards are black*	**2** *The next two cards have different colors*	**3** *The previous card has the same color as the next card*	**4** *There are as many black cards before this card as after this card*
5 *The previous card has the same color as the next card*	**6** *The previous card is white*	**7** *The next two cards have the same color*	**8** *The previous card is black*

Solution Key: *Write the numbers on the eight cards, from first to last.*

19. The Postman

10+15 points



Example with a smaller diagram

Each diagram represents a small district. Find a path that goes along the sections of the streets. The number in each block indicates how many sides of the block are in the path. Each street segment can only be used at most once.

A. 10 points

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

B. 15 points

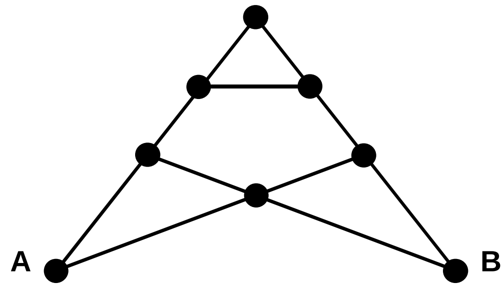
2	2	1	3	1
3	1	1	3	1
2	2	1	2	2
3	3	2	3	2
2	2	2	2	3

Solution Key: *Draw the paths on the diagrams.*

20. The Necktie

10 points

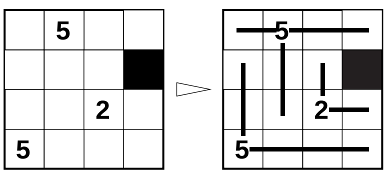
How many paths are there from A to B? You are allowed to go through the same point more than once, but you are not allowed to use the same line segment more than once.



Solution Key: *Write the number of paths in the box.*

21. Straight Rays

15 points



Example, with a smaller grid.

There are straight rays, horizontally and vertically, from each numbered square. The number gives the total number of squares covered by the rays that originate from the square, not counting the numbered square itself. The rays do not intersect or overlap. Each empty square is covered by exactly one ray. No black square is touched by a ray.

			13								
7				■							6
					7						■
											10
		6								3	
	9					■		2			
					8					3	
		■									
			3						5		
6						2		■			
	3						12				
				8							7

Solution Key: *Complete the board with all the rays.*

End of Part 1

Part Two

twenty minutes

Ecosystem

2 points for each card over 35
+20 points to be shared by all participants with the best solution

There are cards in the grid. Each card has a number that indicates how many neighboring cards there are to that card. Two squares are neighbors if they share an edge or a corner. Two cards with the same number are never neighboring. Try to construct as populated an ecosystem as possible (i.e., with as many cards as possible) in an 8x8 grid. In the sample ecosystem (in a 4x4 grid) there are ten cards.

2	3	4	2
	5		3
2		4	
	3	2	

A 4x4 ecosystem with ten cards

Solution Key: *Complete the diagram with the cards placed, and write down the total number of cards in the box.*

Your score in this part will be added to the number of points scored in Part One for your final score. Ties will be broken by the highest score in Ecosystem.

You can use the following boards for scratchwork.