

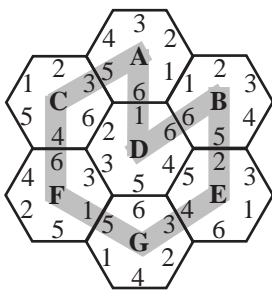
PUZZLE DESIGN TOURNAMENT 2003

PUZZLE 01

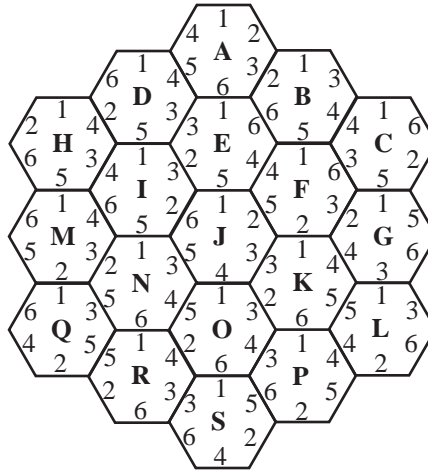
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Rotate the tiles in the grid, and draw a path to produce the highest score. The path produced must move to an adjacent tile and you don't have to visit all the tiles. No tile may be visited more than once, and it is not a requirement to return to the starting tile. Touching numbers of adjacent tiles along the path are multiplied together. Your score is the sum of the individual products produced. Maximize this score.

Example:



$$(5 \times 3 + 4 \times 6 + 1 \times 5 + 3 \times 4 + 2 \times 5 + 6 \times 6 + 1 \times 6 = 108)$$



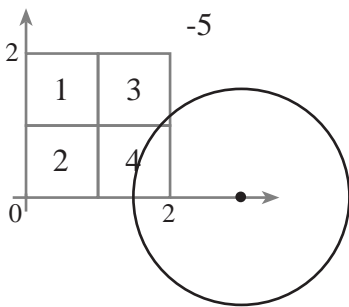
Answer key: Write your score first. Then list the tiles visited in order. The tiles visited must be listed as their letter, followed by their orientation (indicated by the uppermost digit in your rotation of the tile). For the example, the answer key would be: 108: A3,C2,F6,G6,E2,B2,D1,A3

PUZZLE 02

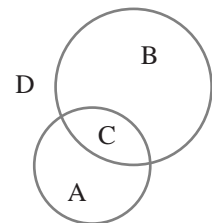
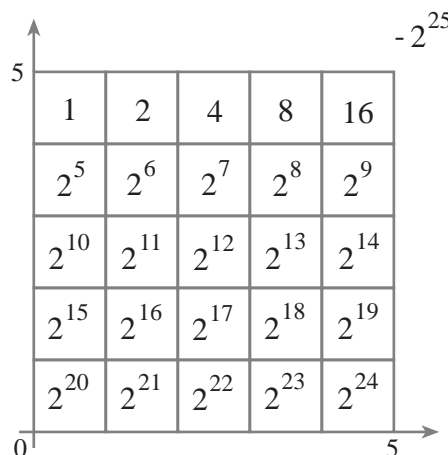
Andreas Bolota andreas@campeuronet.com

The given diagram contains areas of various values (positive inside the grid, negative outside). Two circles will cover the diagram resulting in four different zones as shown; the circle coordinates and diameters must be considered in terms of grid nodes with integral numbers precision. Note that the four zones can still be identified even in particular cases: a big circle containing a small circle (B=C), non-intersecting circles (C=0), etc. Considering the total sum of grid-values covered by each of the four circle-zones, your task is to minimize the total of differences between these totals (i.e. cumulated absolute values of $|A-B| + |A-C| + |A-D| + |B-C| + |B-D| + |C-D|$).

Example with one circle:



Circle (A): $3+4-5=2$
 Outside (D): $1+2+3+4-5=5$
 Difference: 3



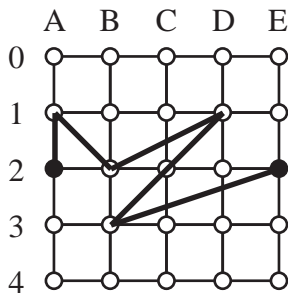
Answer key: Write your score first. Then write the totals for each of the four zones, and for each circle give its center coordinates and diameter. For the example the answer key would be: 3: A=2, D=5, (3, 0), 3

PUZZLE 05

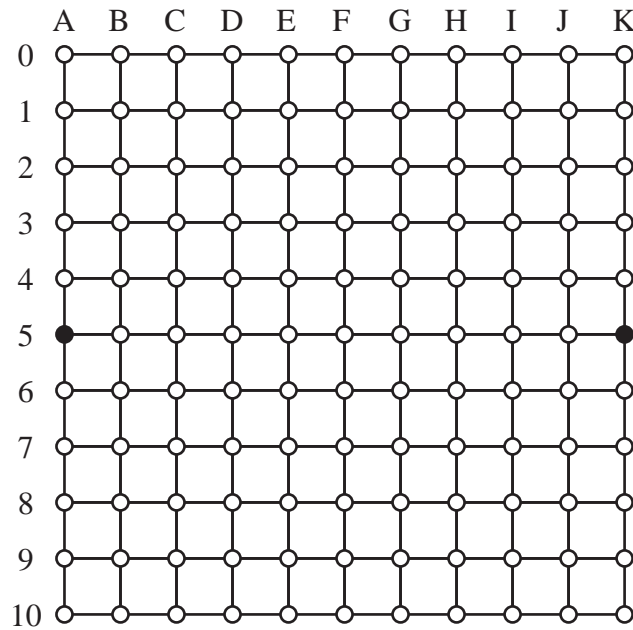
Guillermo Verger ingverger@yahoo.com.ar

There are 121 points in the grid below. The aim of the puzzle is to set the longest continuous path from point A5 to point K5. Each step (line segment between successive points) must be longer than the previous one. Path can not cross or touch itself. Length of each individual line will be calculated up to two decimal digits.

Example:



Lengths of lines in order:
1.00, 1.41, 2.24, 2.83, 3.16
Total: 10.64



Answer key: Write your length first. Then write the coordinates of the points forming the path in the order they are connected. For the example, the answer key would be: 10.64: A2,A1,B2,D1,B3,E2

PUZZLE 06

Joseph DeVincentis devjoe@bellatlantic.net

This is a game involving prime numbers less than 1000. On each of nine turns you will place a different digit 1 through 9 into one of the squares of the 3x3 grid. On the first turn, place a prime digit into the center square (E). Score this number of points. On each subsequent turn, place an unused digit into an empty square so as to form a prime 2 or 3 digit number in the grid, reading up, down, left, right, or in any of 4 diagonal directions, and either starting or ending with the digit you just placed. For each direction in which there is a digit adjacent to the one you just placed, score the largest prime number formed in this fashion. Your score for the game is the sum of the scores for 9 turns. Maximize this score.

Example:

4	5	8
6	3	2
9	7	1

E 3
I 31
H 71+73 = 144
G 971
A 431
C 839
B 53
D 67
F 23
Total: 2562

Grid for notation:

A	B	C
D	E	F
G	H	I

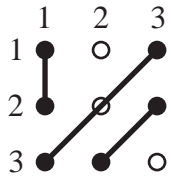
Answer key: Write your score first. Then write the plays for the nine turns, each written using the letter of that square and the digit you placed in the square. For the example, the answer key would be: 2562: E3 I1 H7 G9 A4 C8 B5 D6 F2

PUZZLE 07

Ken Duisenberg kduis@yahoo.com

On a 6x7 grid, place non-intersecting line segments, each beginning and ending on a unique grid point. A line ending on another line is considered to intersect. For example, a line ending on either (1,1) or (2,2) intersects the line from (1,1) to (3,3). Each line must be a different length from every other. Maximize the total length of lines.

Example:



Total length: 5.243

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

Answer key: Write your total length first, followed by the number of lines. Then list your lines in the form of (Ax,Ay,Bx,By). For the example, the answer key would be: 5.243, 3, (1,1,1,2), (3,1,1,3), (3,2,2,3)

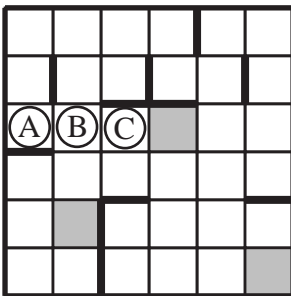
PUZZLE 08

Mark Rich richm@cs.wisc.edu

You have a 9x9 board with walls surrounding the perimeter and interspersed inside the board. Four robots, A, B, C and D, have been placed on the board along with four grey Goal squares. A robot can be shifted in four directions, Up, Down, Left or Right. A move consists of shifting a robot in one direction until that robot hits a wall or another robot.

Let a be the total length of the path created by moving robot A, likewise with b, c and d. Each robot has a different cost of movement. Your goal is to move the robots sequentially until all robots rest in a grey square and minimize the total = 2a + 3b + 5c + 7d.

Example:



After these moves:

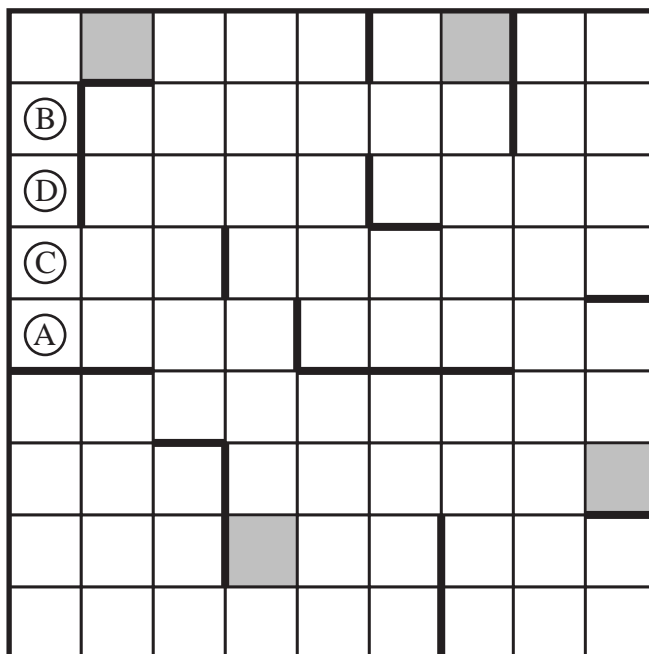
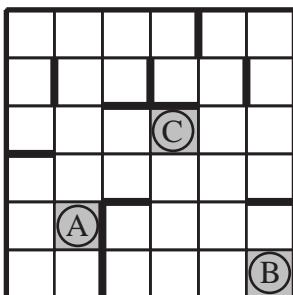
B: D

A: R D

B: L U R U L D

C: D R U L D L D R U

B: R



Answer key: Write your total followed by the sequence of moves used. For the example, the answer key would be: 164: BD, AR, AD, BL, BU, BR, BU, BL, BD, CD, CR, CU, CL, CD, CL, CD, CR, CU, BR

PUZZLE 09 Deepashanthi Srinivasan deepashanthi_m@yahoo.com

We have a set of 28 dominoes (0-0, 0-1, 0-2, ..., 6-6). Place as many dominoes in the 5x5 grid without any blank place left. You can only place a domino (except first domino) in the grid if one edge of the domino is sharing the same number with placed domino (no matter whether the placed domino has already shared the same edge or not) and must be one blank to place the other edge. While placing the dominoes make sure each row/column sum is less than or equal to 15. Your score is the sum of all the numbers in the dominoes which have not been placed in the grid plus the sum of all row/column values. Maximize this score.

Example:

(10 is the maximum row/column sum)

	A	B	C	D	
1	1	1	5	3	10
2	2	3	4	1	10
3	2	3	1	2	8
4	5	2	0	0	7
	10	9	10	6	

	A	B	C	D	E
1					
2					
3					
4					
5					

0 0	1 1	2 2	3 3	4 4	5 5	6 6
0 1	1 2	2 3	3 4	4 5	5 6	
0 2	1 3	2 4	3 5	4 6		
0 3	1 4	2 5	3 6			
0 4	1 5	2 6				
0 5	1 6					
0 6						

Total of dominoes left: 99

Total of row/column values: 70

Score: 99+70=169

Answer key: Write your score first, followed by all the dominoes in the order to place along with the coordinates. For the example, the answer key would be: 169: 35:DC1, 15:BC1, 11:AB1, 12:A12, 22:A23, 25:A34, 45:C21, 14:DC2, 34:BC2, 33:B23, 23:B43, 13:CB3, 01:C43, 00:CD4, 02:D43

PUZZLE 10

Travis Taylor travis_r_taylor@hotmail.com

Create a 5x5 magic square (that is a square with each row's, column's and each of the two main diagonal's sum is the same number) with the digits 1 through 25. Put a knight on any square to start. As the knight moves, points are collected as such: at the starting square, you gain the amount of points in that square, in the second square, you gain twice the amount of points in that square, in the third, you gain three times, and so on. A knight moves drawing an L-shape, as shown in the 3x3 example below. The knight's path cannot visit any square twice, and need not visit every square. Maximize your points.

Example:

8	1	6
3	5	7
4	9	2

Knight's path: 8963214

Answer key: Write your score first. Then write the numbers in the magic square row by row. And add the numbers knight visits, in order. For the example, the answer key would be: 100: 816,357,492;8,9,6,3,2,1,4

END