

# PQRST 06 PUZZLE COMPETITION

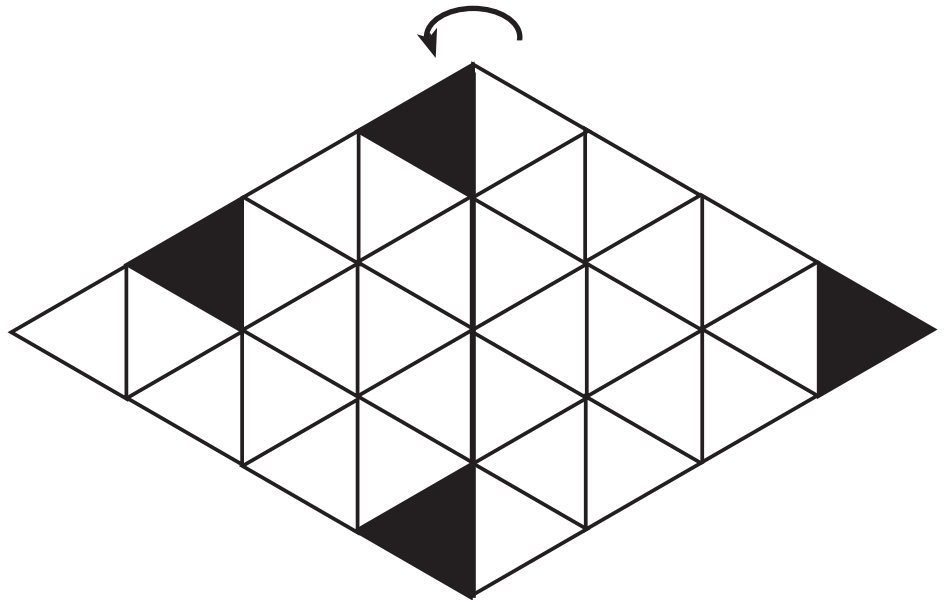
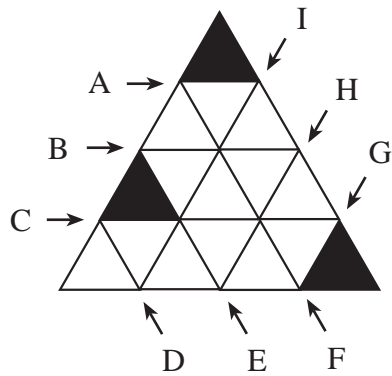
PUZZLE 01 (15 points penalty for a wrong answer)

55 points

## Lateral Fold

Cut out the diamond-shape figure below and fold the right half of it to the back of the other half. You'll get an equilateral triangle shown on the left with some black cells on both sides. Fold this triangle some number of times along the grid lines so that you end up with an equilateral triangle of side-length 2 with four black cells on one side. After each fold, the paper must be flat.

Start:



Finish:



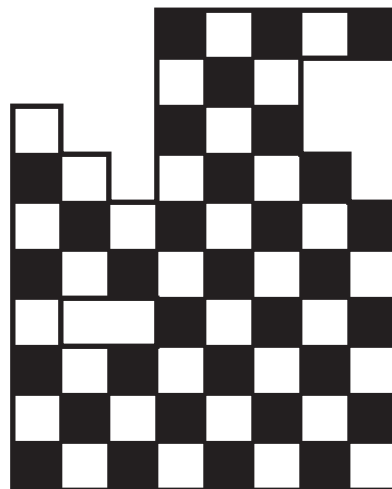
**Answer key:** Enter the letters representing the lines on which you made your folds, in alphabetical order, in the form of: ACE...

PUZZLE 02

45 points

## Chess Variant

Cut the board below along the grid lines into two pieces and bring them together to form a chess board. You can rotate the pieces, but can not reflect them.



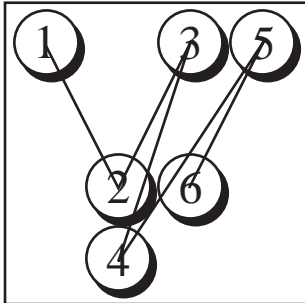
**Answer key:** Enter the number of black cells and the number of white cells in the smaller piece, in order.

PUZZLE 03 (10+10 points penalty for wrong answers) 45+70 points

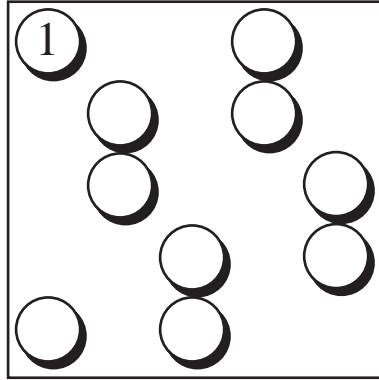
## No Neat Line

Connect the centers of all the circles in the diagram with a single continuous line that doesn't touch or cross itself. Start with circle-1 and number the circles as you go along. Adjacent numbers will be connected with straight lines. But these lines must not be horizontal, vertical or diagonal, ie making multiples of 45 degrees with the horizontal. Some numbers may already be given.

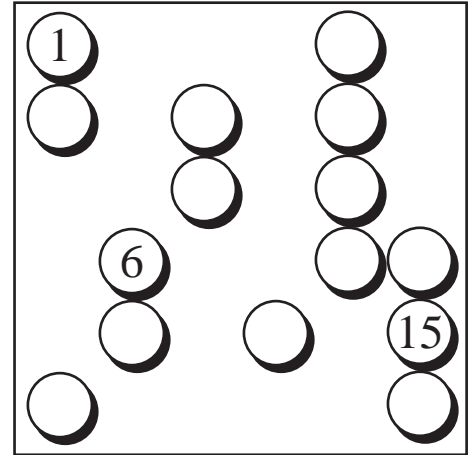
Example:



A) 45 points



B) 70 points

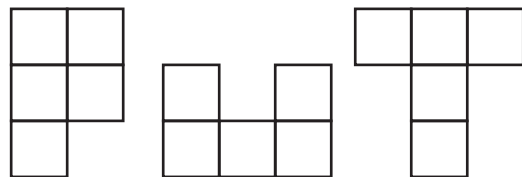
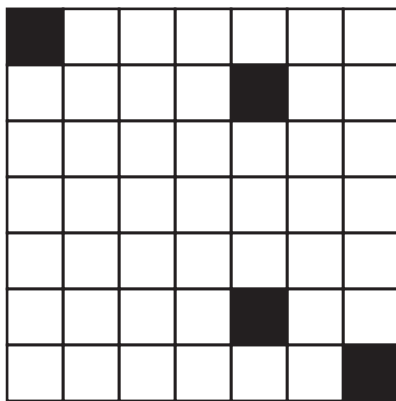


**Answer key:** Enter the numbers on; a) the third row from left to right, b) the fifth column from top to bottom. The answer key for the first row of the example would be: 1,3,5

PUZZLE 04 (10 points penalty for a wrong answer) 75 points

## PUT Pentominoes

Put three sets of P, U, T pentominoes into the diagram without overlapping each other or the black cells. You can rotate and/or reflect the pentominoes.



X

3

**Answer key:** Enter the letters representing the pentominoes on the middle row from left to right, in the form of: PPTTUUP

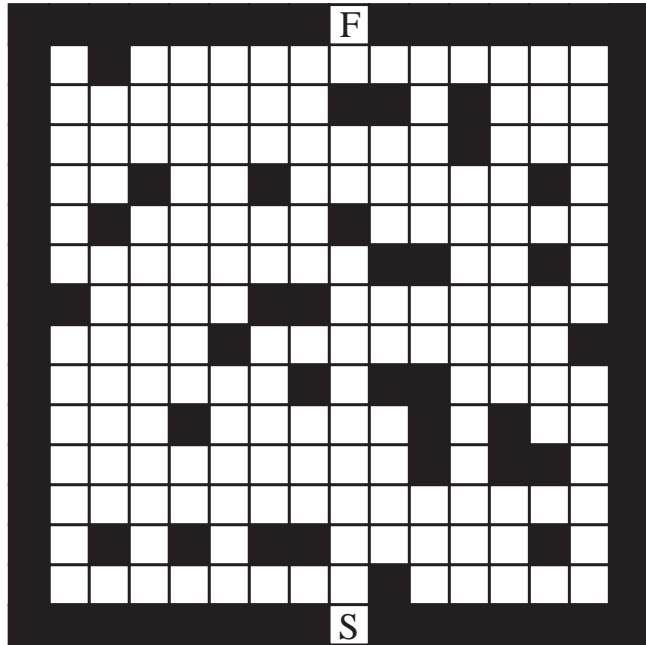
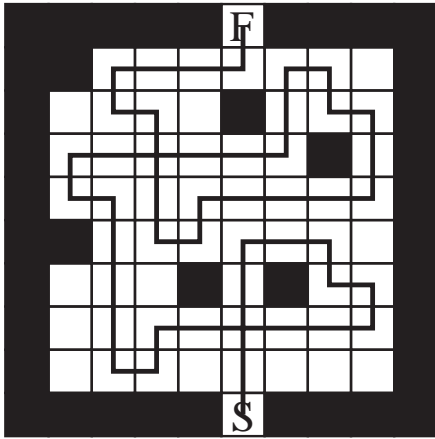
PUZZLE 05 (30 points bonus for the shortest path)

60 points

# RRL Maze

Find a path from Start to Finish traveling horizontally or vertically. As you travel, your turns must make cycles of right-right-left moves (RRLRRLRRLR is a legal cycle). You can not pass through black cells and can not retrace your path. You may cross your path any time. The solution with the shortest path will get a bonus of 30 points.

Example:



**Answer key:** Number each square on your path starting with numbering the Start square as 1. Enter the number on the Finish square first. Then enter the the numbers on the squares that you made a turn in order from start to finish. The answer key for the example would be:

50: 5,7,8,9,10,15,16,17,21,22,23,28,30,31,32,33,35,39,40,41,44,45,46,49

PUZZLE 06

60 points

# Bigrid Battleships

Position the 10-ship fleet horizontally or vertically into two grids at the same time. Some ships are on the first grid, the rest on the other. Ships do not touch each other, not even diagonally. Numbers on the sides reveal the number of ship segments on the respective row or column.

	A	B	C	D	E	F	
M							3
N							1
O							2
P							1
Q							2
R							1
	0	4	0	1	4	1	

	G	H	I	J	K	L	
S							2
T							1
U							4
V							0
W							1
X							2
	1	3	0	2	3	1	

**Answer key:** Enter the coordinates of the four 1-unit submarines in the form of: AM, LX

# Hard as XYZ

Locate two sets of figures X, Y, Z into the grid so that the letters outside the grid indicate the first letter that appears from the corresponding direction. You can rotate the figures, but can not reflect them. Lines forming the letter shapes must not overlap.

**Example with one set:**

The diagram illustrates the puzzle mechanics. On the left, a 5x5 grid shows three figures: 'Z' (a horizontal line with a vertical stem), 'X' (two intersecting diagonal lines), and 'Y' (a vertical stem with two diagonal arms). These are placed on a grid with letters Z, X, Y above and below. To the right is a larger 10x10 grid with letters Z, Y, Z on its sides. Further right are two sets of the figures X, Y, and Z, each set containing one of each figure.

**Answer key:** Enter the letters representing the figures on the southwest-northeast diagonal from lower-left to upper-right. Use B for blank cells. The answer key for the example would be: BBBXZBBB

# Piece of Mind

"Your father was younger than you are when you were born. Yet, he was much better a mathematician than you are now." said the old mathematician to his colleague.

"He left nothing but a pen after he's gone, then." was the response. "And I think I'm better than he was."

"I don't have much either; only this piece of land in the shape of a right-triangle. If you find the lengths of the two right-sides, whole numbers  $a$  and  $b$ , then you prove that you're as good as your father and I'll happily give you the land. On this paper, I'm writing the perimeter of the land, neglecting the decimal digits, I mean erasing the digits after the decimal point. It is equal to your age."

"It's not enough information."

"I'm writing the area of the land, neglecting the decimal digits again. It would be equal to your father's age if he was alive."

"This is not enough either."

" $b$  is the shorter one."

"Now I know what  $a$  and  $b$  are."

**Answer key:** Enter  $a$  and  $b$  in order.

# Evenly Distributed

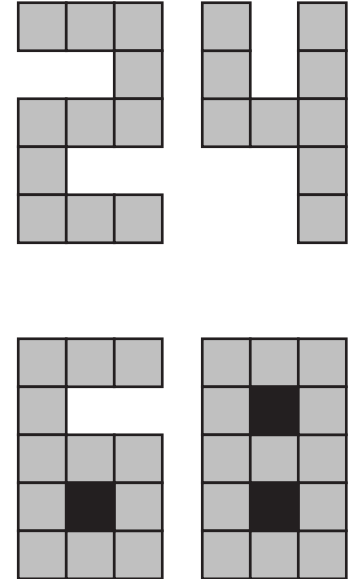
Locate figures of digits 2, 4, 6 and 8 into the grid without touching each other, not even diagonally. You can rotate the figures, but can not reflect them. Score for each digit is that digit times the total of the numbers it's located on. Maximize the total of the scores of the four digits.

**Example:**

	A	B	C	D	E	F	G
H	2	7	1	8	2	8	1
I	8	2	8	5	9	0	
J	4	5	2	3	5	3	6
K	0	2	8	7	4	7	1
L	3	5	2	6	6	2	4
M	9	7	7	5	7	2	4
N	7	0	9	3	6	9	9

4 x 46 = 184  
 6 x 49 = 294  
 Total = 478

	A	B	C	D	E	F	G	H	I	J	K	L
M	2	7	1	8	2	8	1	8	2	8	4	5
N	9	0	4	5	2	3	5	3	6	0	2	8
O	7	4	7	1	3	5	2	6	6	2	4	9
P	7	7	5	7	2	4	7	0	9	3	6	9
Q	9	9	5	9	5	7	4	9	6	6	9	6
R	7	6	2	7	7	2	4	0	7	6	6	3
S	0	3	5	3	5	4	7	5	9	4	5	7
T	1	3	8	2	1	7	8	5	2	5	1	6
U	6	4	2	7	4	2	7	4	6	6	3	9
V	1	9	3	2	0	0	3	0	5	9	9	2
W	1	8	1	7	4	1	3	5	9	6	6	2
X	9	0	4	3	5	7	2	9	0	0	3	3

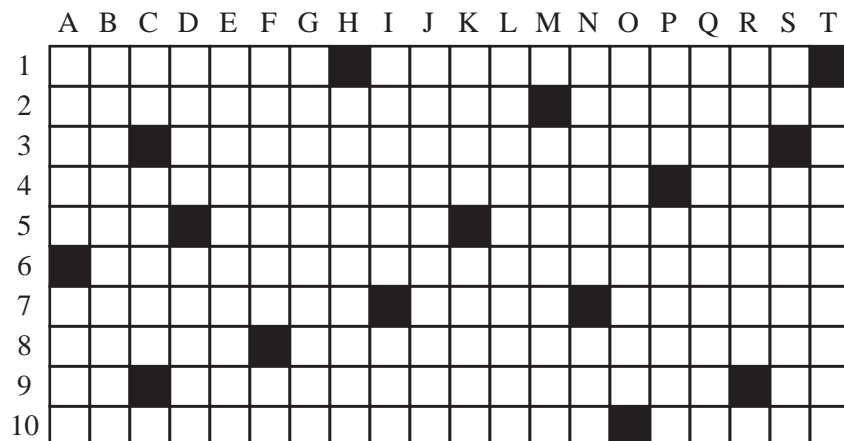
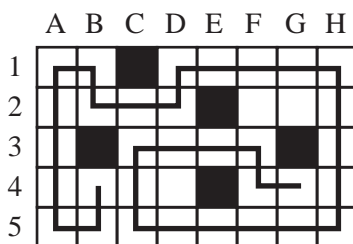


**Answer key:** Enter your total score first. Then describe each digit's location by giving the coordinates of the top-left and the bottom-right cells of the figure in order. The answer key for the example would be: 478: 4: CN-AJ, 6: GH-CJ

# Bad Track

Start with any square and direction and go straight ahead until you come across the edge of the diagram or a black square. Then turn right or left and this time go straight ahead until you come across the edge of the diagram, a black square or a previously passed square. Continue until there is nowhere to go. Find the longest path with these rules.

**Example:**



**Answer key:** Enter the length, the coordinates of your starting square and your direction (north, south, west or east) first. Then enter your turns in order, using r for right and l for left. The answer key for the example would be: 32: B4: south: rrrllrrrrrl

END