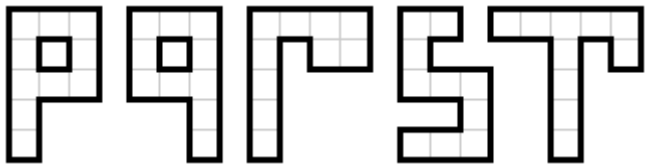
# PQRST 01 PUZZLE COMPETITION

PUZZLE 1 30 points

## PQRST Construction

Each figure below is constructed with the same three pieces. Divide the figures by following the grid lines into three parts to identify these pieces. Pieces may be rotated but not reflected. Give a letter to each piece as A, B, C.




**Answer key:** Enter the letters corresponding to the squares of the figure P from left to right and top to bottom, starting with the first row, then the second row, continuing until the fifth row.

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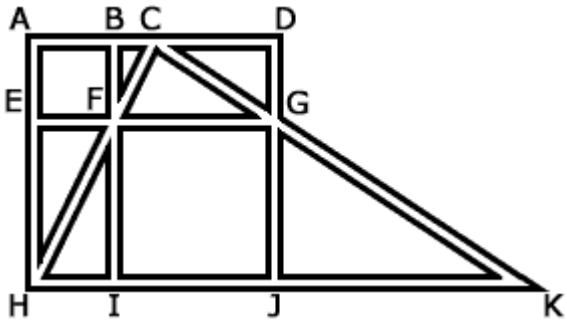
PUZZLE 2 60 points

## Police Officers

The map below shows the street locations of a city. Position three police officers so that any point on any street can be seen by at least one officer.




**Answer key:** Enter the letters corresponding to the three positions.

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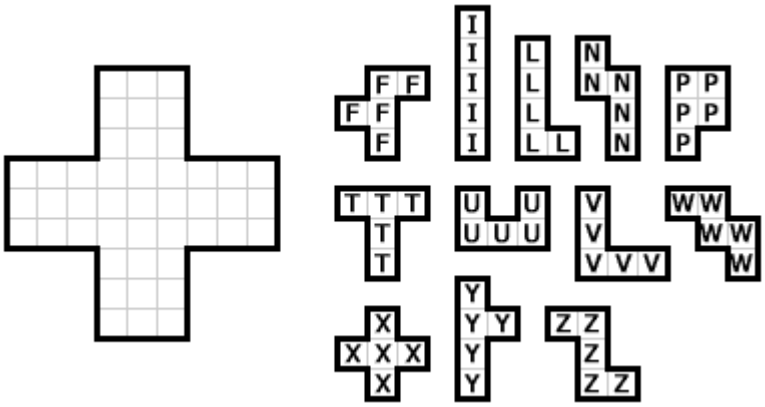
PUZZLE 3 125 points

# Pentomi No

Below are the 12 pentominoes and a game board. Place four different pentominoes on the board so that none of the other eight can be placed. Pentominoes may be rotated and/or reflected. You must follow the grid lines.




**Answer key:** Enter the letters corresponding to the 45 squares of the board from left to right and top to bottom, starting with the first row, then the second row, continuing until the ninth row. Use B for blank squares.

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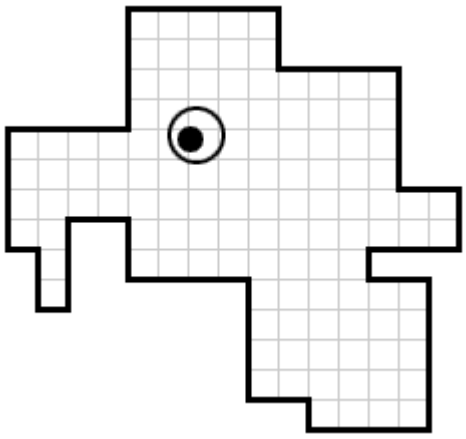
PUZZLE 4 110 points

# Cut the Laugh

Cut the laughing guy into three identical regions. The three regions must have the same size and shape, but may be rotated and/or reflected. You must follow the grid lines. You don’t have to consider the eye.



**Answer key:** Enter the length (in linear units) of the circumference of one region.

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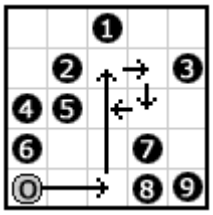
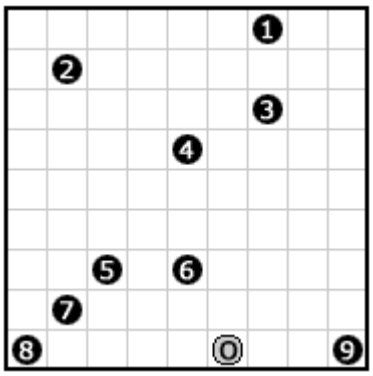
PUZZLE 5 110 points

# Unidentified Flying Observer

This puzzle is a combination of the UFO and Observer puzzles.
There are nine normal robots (1-9) and one observer robot (0) in the grid. Each one of the ten robots travels left, right, up or down only towards another robot, without hitting it. That is a step. A move consists of one or more steps.
The observer robot (0) can see a normal robot if there is no robots in between on the straight line connecting the centers of the two robots.
The goal is to end up with the observer robot on the center square with seeing exactly five normal robots, after four moves.

Example: There is a starting position of a smaller grid on the right. At the start observer robot can see six normal robots (6, 2, 5, 3, 7, 8). Observer robot reaches to the center square after one move consisting of five steps: Right, up, right, down, left.
After this move the observer robot can see seven normal robots (6, 5, 2, 1, 3, 7, 8).





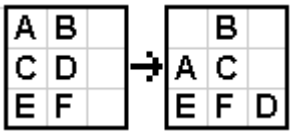
**Answer key:** Enter the moves that get the observer robot to the center square. Describe each move with the number of the robot (0-9) and the directions traveled. For the example above, answer key is 0-RURDL. Use comma between the moves.

PUZZLE 6 70 points

# Puzzle Sliding

The board below is perpendicular to the ground. The letters represent 41 different pieces. A piece can only move one square either right or left and can only slide the neighbouring piece on his way with it, not the ones above or below it. If there is a space below a piece that piece falls until there is another piece or the bottom of the board below. Your goal is to make four moves to read PUZZLE in a straight line horizontally, vertically or diagonally either ways.

Example: The result of the move C-right is seen on the right.

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| L | | U | E | L | E | L | Z |
| E | L | U | Z | U | E | Z | L |
| Z | P | E | E | P | P | U | E |

**Answer key:** Enter the four moves. Describe each move with the letter that is written on the piece and the direction. For the example, answer key is C-R. Use comma between the moves.

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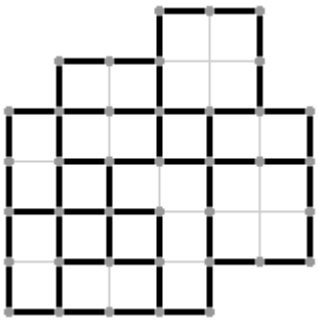
PUZZLE 7 (20 points penalty for a wrong answer) 75 points

# Two Watch

The black lines represent streets of a city. There are watchers on some of the grey points. A watcher can only see two linear units away from where he stands. He can't see a point which is not on one of the streets he stands on. Locate the fewest number of watchers possible onto some of the grey points in order to watch all of the street lines.
Note: 20 points penalty for a wrong answer.



**Answer key:** Give numbers to each of the 39 grey points from left to right and from top to bottom, starting with the first row, then the second row continuing until the seventh row from 1 to 39. Enter the number of watchers following with the numbers of the grey points where the watchers stand.

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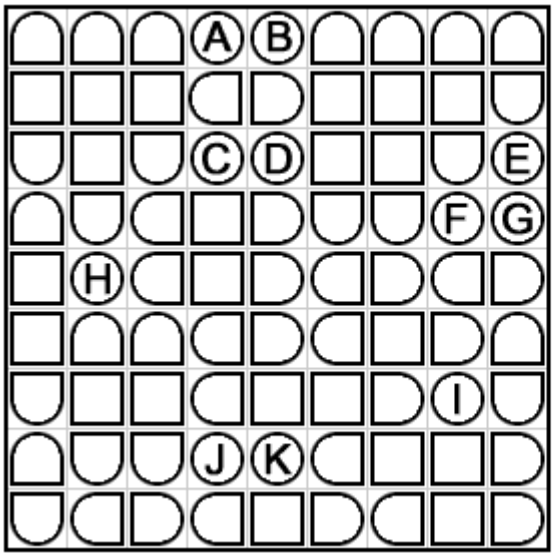
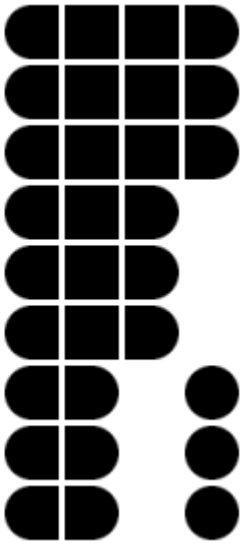
PUZZLE 8 70 points

# Retrigrade Battleship

In this variation of the Battleship Puzzle, possible placements of the 12-ship fleet is given. There are three 4-unit battleships, three 3-unit cruisers, three 2-unit destroyers and three 1-unit submarines. Ships are oriented horizontally or vertically and they don't touch each other, not even diagonally.



**Answer key:** Enter the three letters corresponding to the three 1-unit submarines.

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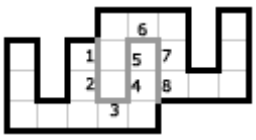
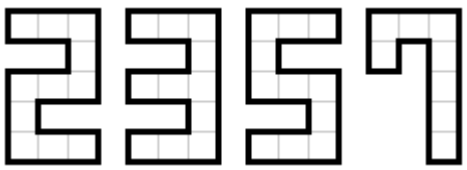
PUZZLE 9 (bonus for 1st, 2nd, 3rd sol.s:100, 65, 35 points)

# Touching Primes

Arrange the four figures of the primes 2, 3, 5, 7 in the plane to get the highest total you can reach. Your score for a prime is that prime multiplied by the number of unit lines it is touching. Your total is the sum of the four primes' scores. Figures may be rotated but not reflected, and they must not overlap. There are only bonus points for the highest three totals.

Example: If the puzzle were to arrange 2 and 3, the answer could be the one on the right. Here, 2 touches eight unit lines and has the score 2 x 8 = 16. 3 touches eight unit lines and has the score 3 x 8 = 24. Total is 16 + 24 = 40.



**Answer key:** Number each figure's unit squares with the prime it's representing. Frame your solution to make a rectangle. Enter the numbers corresponding to the unit squares of your rectangle from left to right and top to bottom, starting with the first row until the last row. Use 0 for blank squares. Enter your total before the numbers. For the example above, answer key is 40: 00022202, 30323202, 30323222, 33333000.

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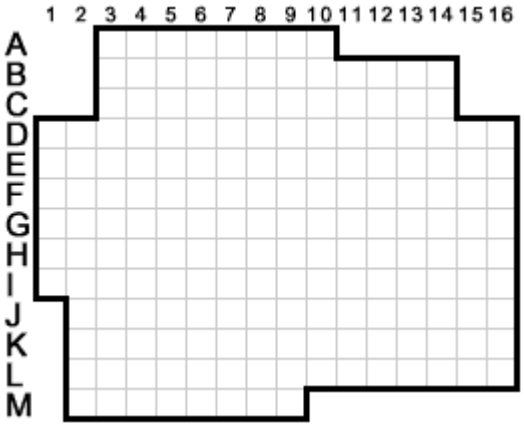
PUZZLE 10 (bonus for best sol.: 20 points)  10x(20-S) points

# Minimum Squares

Divide the grid into the fewest number of squares along the grid lines. Squares can not overlap. S is the total number of squares you get. There is also a bonus point for the best solution: 20 points.




**Answer key:** Mark the top left square unit of each square of your solution. That unit square's location (in the form A1,..., M16) represents your actual square's location, too. Enter your squares' locations following with the side lengths. Enter the total number of squares you get before the locations. Your answer key will look something like; 30: A3-4, A7-4, ...
Don't write the locations of the squares having side lengths 1 or 2.

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**END**

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