

Name

Country

Part VII

Optimization

9th World Puzzle Championship
October, 2000

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|---|----------------|---------------------------|
| 1 | Triangles | (N-50) points |
| 2 | Crossword Maze | (N-150) points |
| 3 | Connect-i-cut | $3 \cdot (80 - N)$ points |

Each optimization problem defines a value for N. The scoring formulas (shown above and at the top of each problem page) convert N to the number of points earned. If the formula gives a negative value, you will get 0 points.

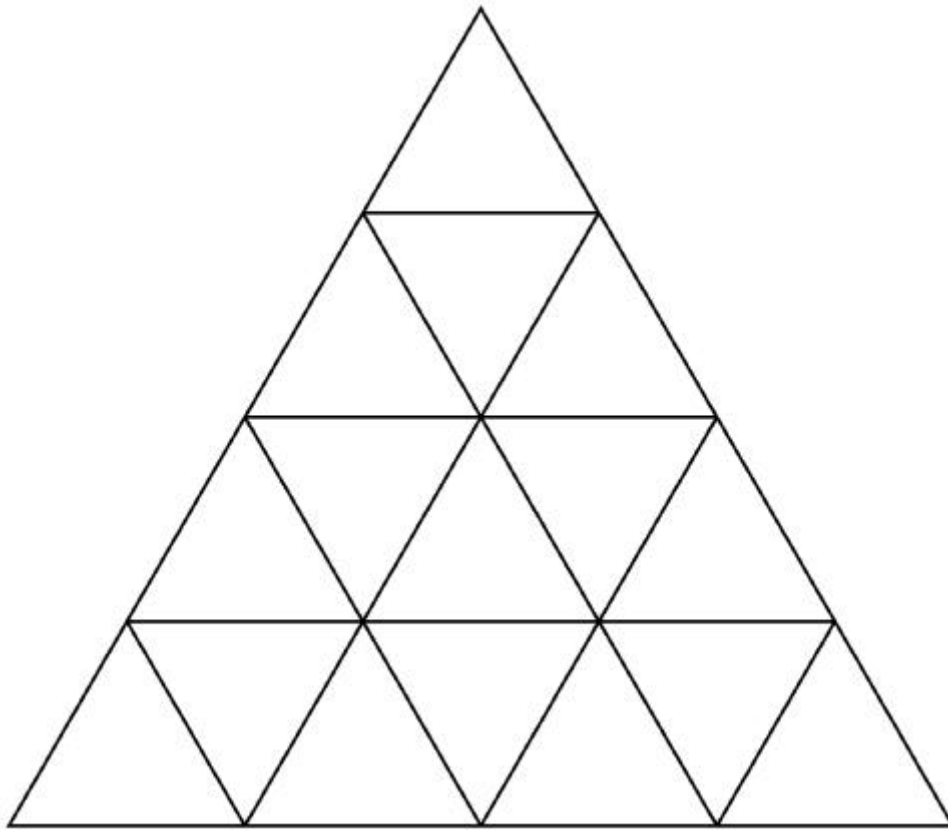


1 - Triangles

(N-50) points

In the diagram below, there are 27 equilateral triangles of various sizes and orientations. Add three lines (of any length) anywhere in the diagram so that the total number of equilateral triangles is maximized.

N is the number of equilateral triangles in the diagram after adding the 3 new lines. You **must** indicate the correct value of N in the box below in order to earn **any** points.



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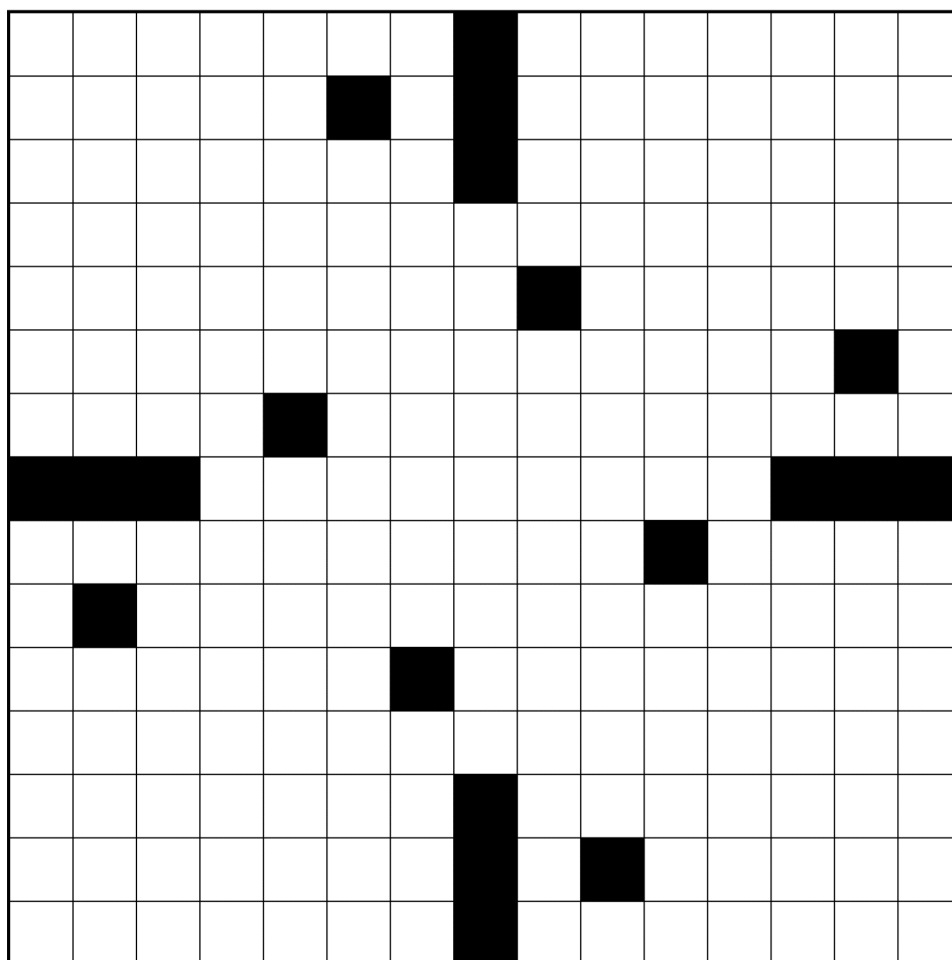
2 - Crossword Maze

(N-150) points

Add one black square anywhere in the crossword grid. Then draw the longest path you can, according to the following rules.

Your path can start in any white square (mark it with an S). Travel in any direction horizontally or vertically until you come to a black square or a wall. Then turn left or right and continue traveling, using the same rules. You may cross your path any time. Continue until you are forced to retrace part of your path (assume that the path connects the centers of adjacent squares).

N is the length of your path, the total number of squares that it passes through. Squares where the path crosses are counted twice, once for each time you pass through it (this may include both the starting and ending squares).



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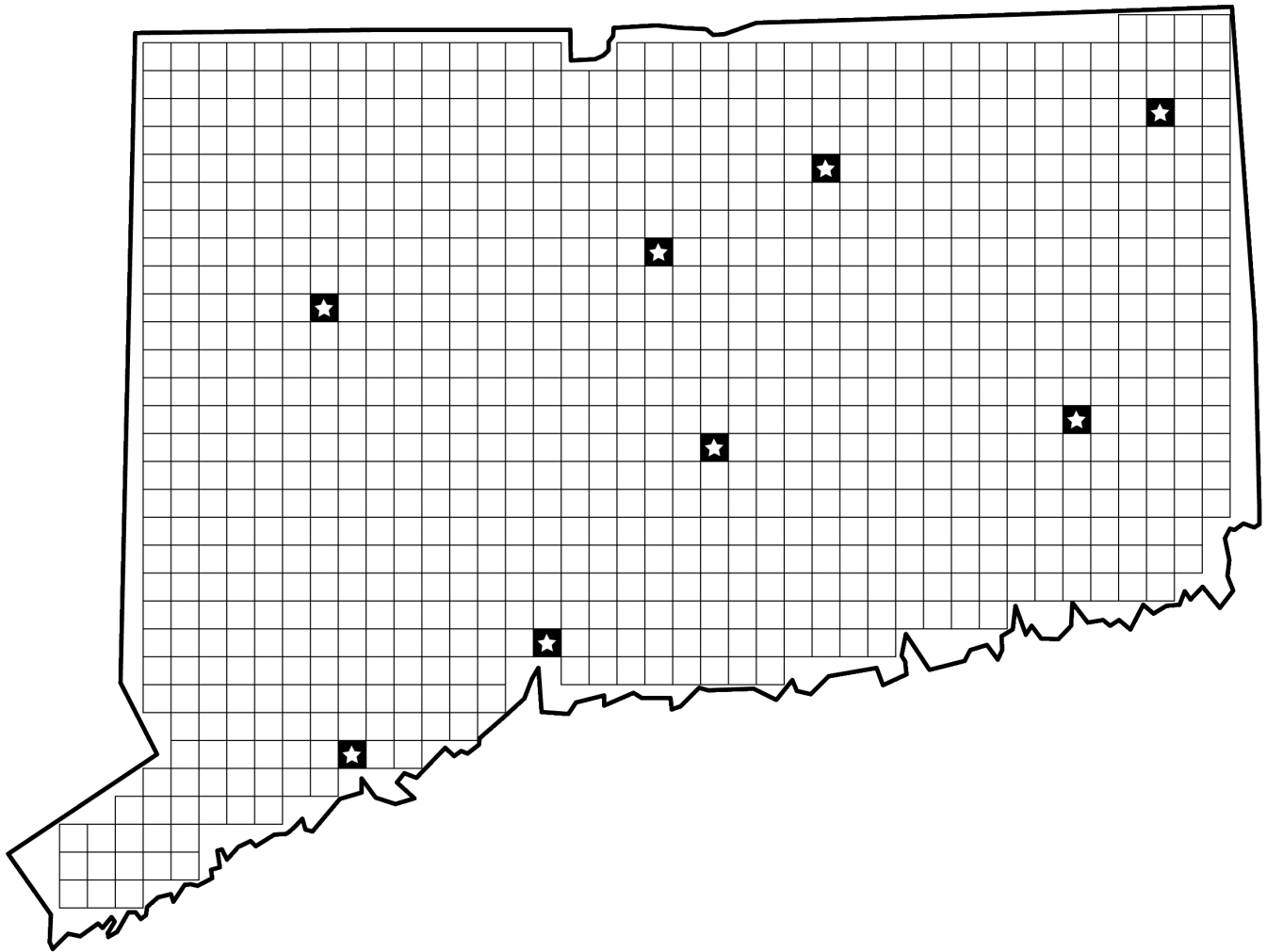
3 - Connect-i-cut

3* (80-N) points

Divide the map of Connecticut into the fewest number of squares.

Your squares must follow the grid lines, and cannot include the black squares (representing the eight counties of Connecticut!).

N is the total number of squares used. Any area of the map not divided into squares will be counted as the corresponding number of unit squares.



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