# WPF SUDOKU/PUZZLE GRAND PRIX 2024

# WPF PUZZLE GP 2024
## COMPETITION BOOKLET

## Host Country: Switzerland

## Markus Roth, Esther Naef, Marcel Nick (testsolver)

**Special Notes**: The theme of this round can be determined by taking the first letters of the puzzle titles in order. Any shading in light cyan is purely for thematic purposes. An earlier version of the instruction booklet had incorrect author attributions and slightly different score values; these values should be correct.

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### 1-2. Infection [Markus Roth] (9, 16 points)

Fill some cells with a number from 1 to 4. All numbered cells must be orthogonally connected into a single region. Orthogonally adjacent cells cannot contain the same number. Each number must indicate the number of orthogonally adjacent numbered cells. Some numbers are given to you. Some cells are marked with a 'x'; those cells must not be filled with a number.

*The shaded cells in the example solution are only used to help visualize the solution.*

**Answer**: For each designated row, enter its contents, from left to right. Use 'X' for an empty cell.

**Example Answer**: 1XXXX,X2X23

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## 3-5. Tetroscope (Variable Set) [Esther Naef, Esther Naef, Markus Roth] (11, 22, 31 points)

Locate some tetrominoes (contiguous regions of four cells) in the grid. Each piece of a tetromino occupies a single cell. Tetrominoes do not touch each other, not even diagonally (that is, if two tetromino pieces are in touching cells, they must be part of the same tetromino). The set of tetrominoes you must locate is supplied for you. Two tetrominoes are considered the same if one can be rotated to match the other. (Reflections are considered different.)

Some numbers are given at corners of grid cells, which must match the number of cells touching that corner that are part of a tetromino.

*The letters on the provided set of tetrominoes are for Answer purposes only.*

**Answer**: For each designated row, enter the contents of each cell, from left to right. Use 'X' for a cell without a tetromino piece; otherwise use the letter matching the appropriate tetromino.

**Example Answer**:
`TXXIIII,XXOOXXJ`

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## 6-7. Squares & Rectangles [Esther Naef] (12, 42 points)

Divide the grid into rectangles along the grid lines such that each cell is in exactly one rectangle and each rectangle contains exactly one given quadrilateral symbol (black diamond or white bar). Each black diamond must be in a rectangle where the height and the width are the same. Each white bar must be in a rectangle where the height and the width are different. Any two rectangles that touch along at least one cell edge must have different areas.

*The dots in cells are only used for entering your answers.*

**Answer:** Enter the area of the rectangle each dot is in, reading the dots from left to right. (Ignore which row the dots are in.) Use only the last digit for two-digit numbers; e.g., use '0' for a rectangle with area 10.

**Example Answer**: 224966

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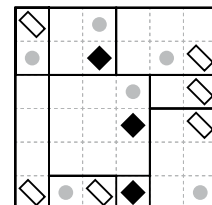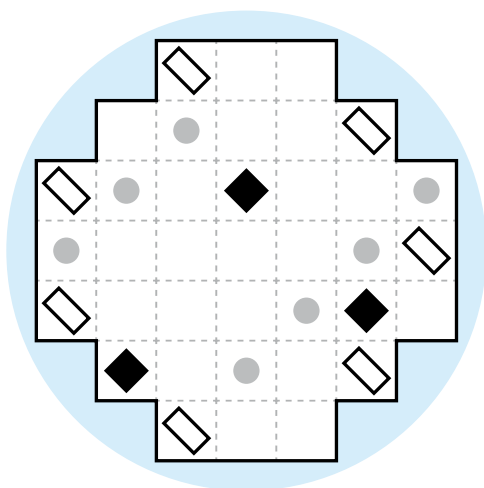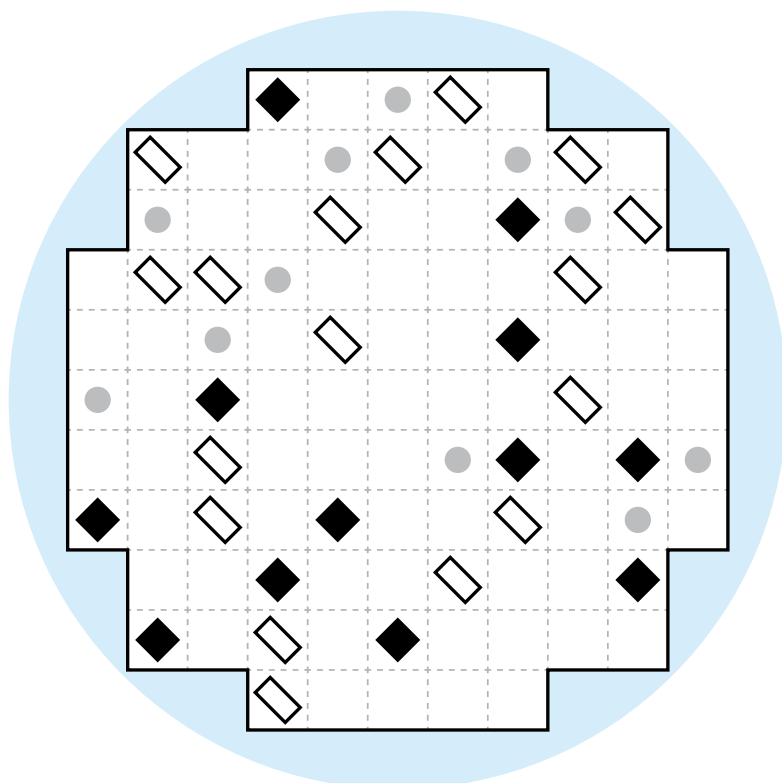
**8-10. Offspring [Markus Roth] (9, 26, 88 points)**

Place a number from 1 to 9 into each cell. Cells containing the same number cannot touch (along an edge or corner). For any two distinct numbers, every cell containing the larger number must touch at least one cell containing the smaller number. (For example, a cell that contains a 5 must touch a 4, a 3, a 2, and a 1.) Some numbers may be already filled in the grid.

| | | | | | |
|---|---|---|---|---|---|
| 3 | 2 | 3 | 5 | 3 | 2 |
| 4 | 1 | 4 | 2 | 1 | 6 |
| 2 | 5 | 6 | 7 | 5 | 4 |
| 6 | 3 | 9 | 8 | 3 | 2 |
| 1 | 4 | 2 | 1 | 4 | 1 |

**Answer**: For each designated row, enter its contents from left to right (including any given numbers).

**Example Answer**: 414216,142141

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**11-13. Norinori [Markus Roth, Esther Naef, Esther Naef] (9, 33, 74 points)**

Locate some dominoes in the grid. A domino occupies two cells that touch along an edge. Cells belonging to different dominoes cannot touch along an edge. Each outlined region must contain exactly two cells that belong to dominoes (they can be the same domino, or two different dominoes).
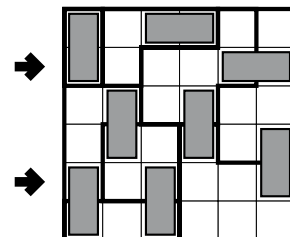
**Answer:** For each designated row, enter its contents from left to right. Use 'x' for a cell that does not belong to a domino and 'o' for a cell that belongs to a domino. You may use other letters or numbers, as long as they are distinct.

**Example Answer**: OXXXOO **,** OXOXXO

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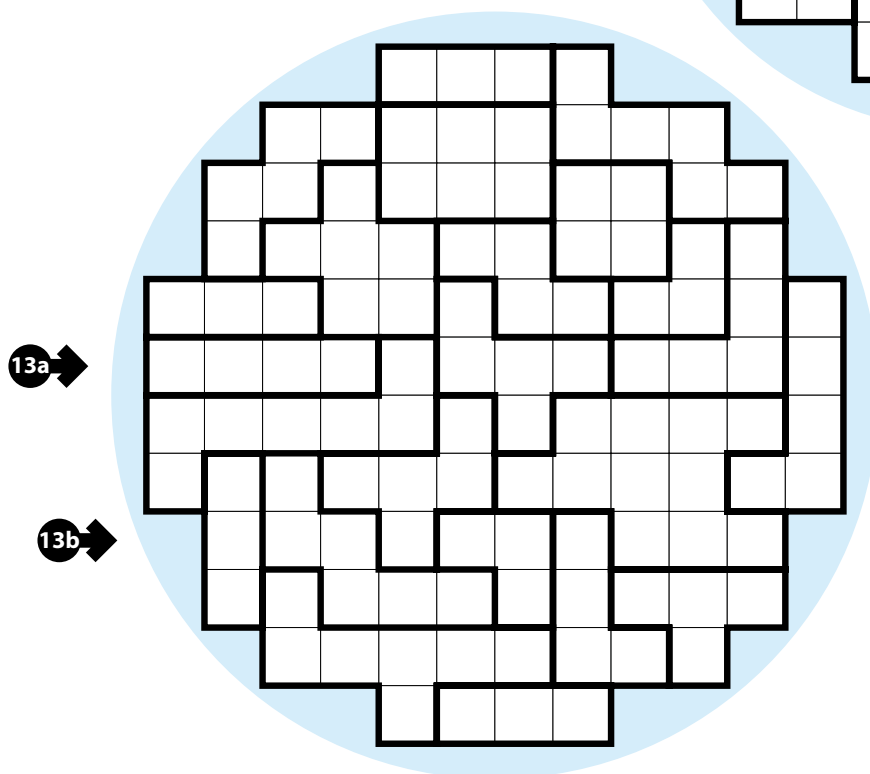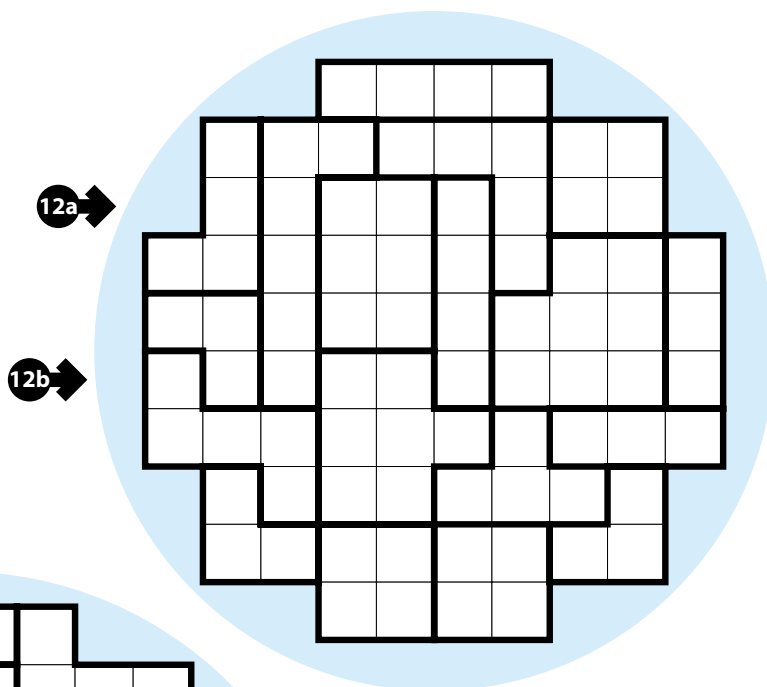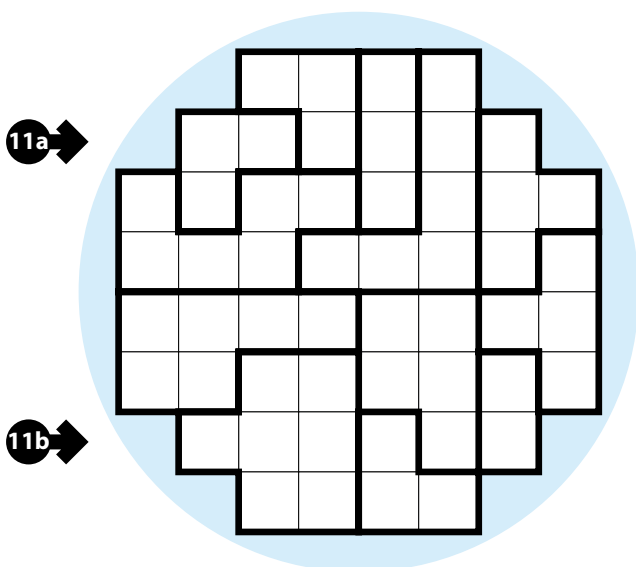
**14-15. Ebony & Ivory [Markus Roth, Esther Naef] (22, 62 points)**

Put a black square or a white circle into each cell of the grid. A number to the left of (or above) the grid indicates the length of the largest group of consecutive cells along that row (or column) that all contain black squares. A number to the right of (or below) the grid indicates the length of the largest group of touching cells along that row (or column) that all contain white circles. As a special case, if the clue "0" is given, it means there should be no matching symbols of the appropriate type in that row (or column).

**Answer**: For each designated row, enter its contents from left to right. Use 'O' for a white circle and 'X' for a black square. Do not include any given numbers outside the grid. You may use two other characters, as long as they are distinct.
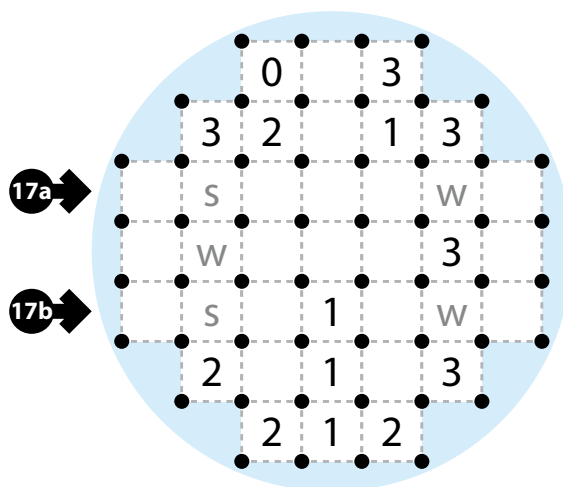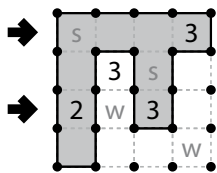
**Example Answer**: XOOXXO , XOOOXX

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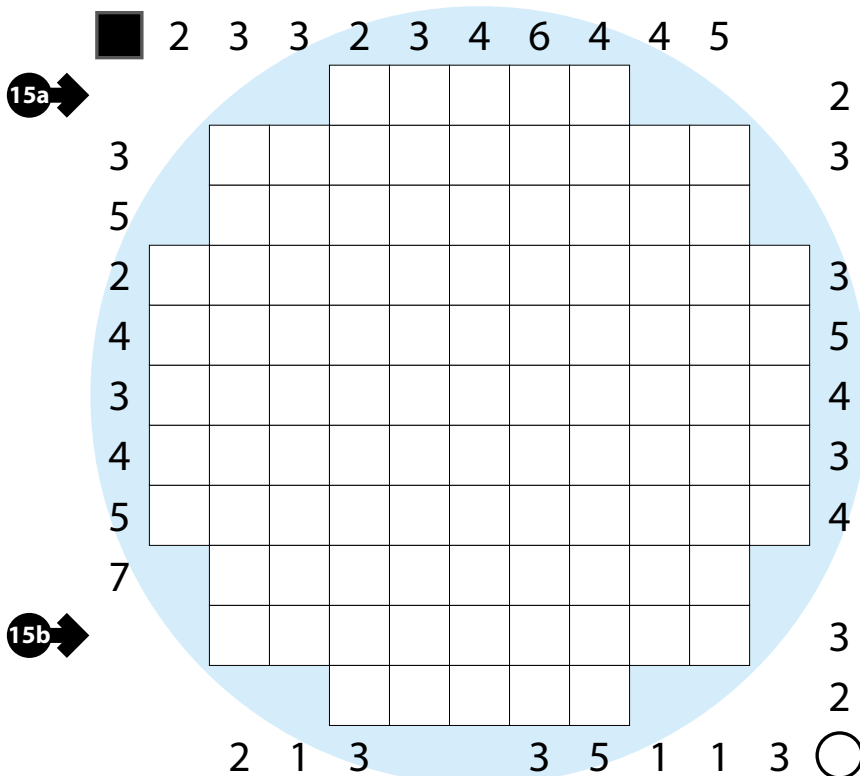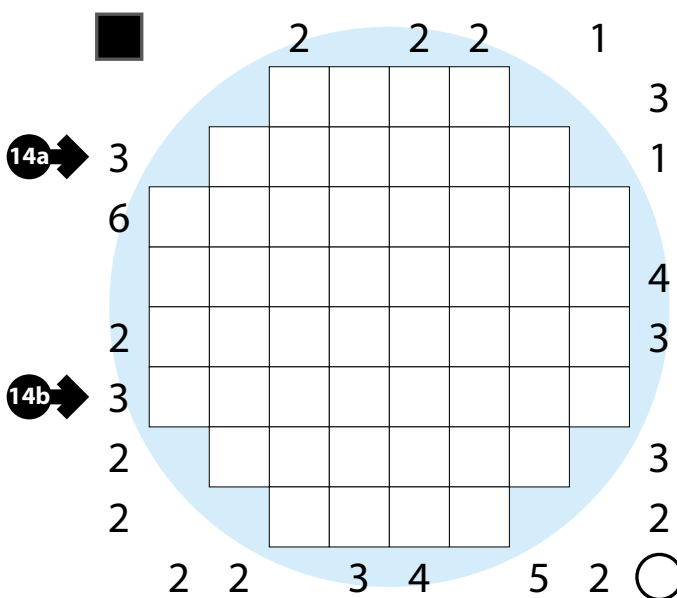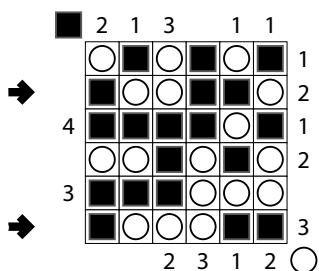
## 16. Ebony & Ivory [Esther Naef] (55 points)

**Answer**: For each designated row, enter its contents from left to right. Use 'O' for a white circle and 'X' for a black square. Do not include any given numbers outside the grid. You may use two other characters, as long as they are distinct.

**Example Answer**: XOOXXO , XOOOXX
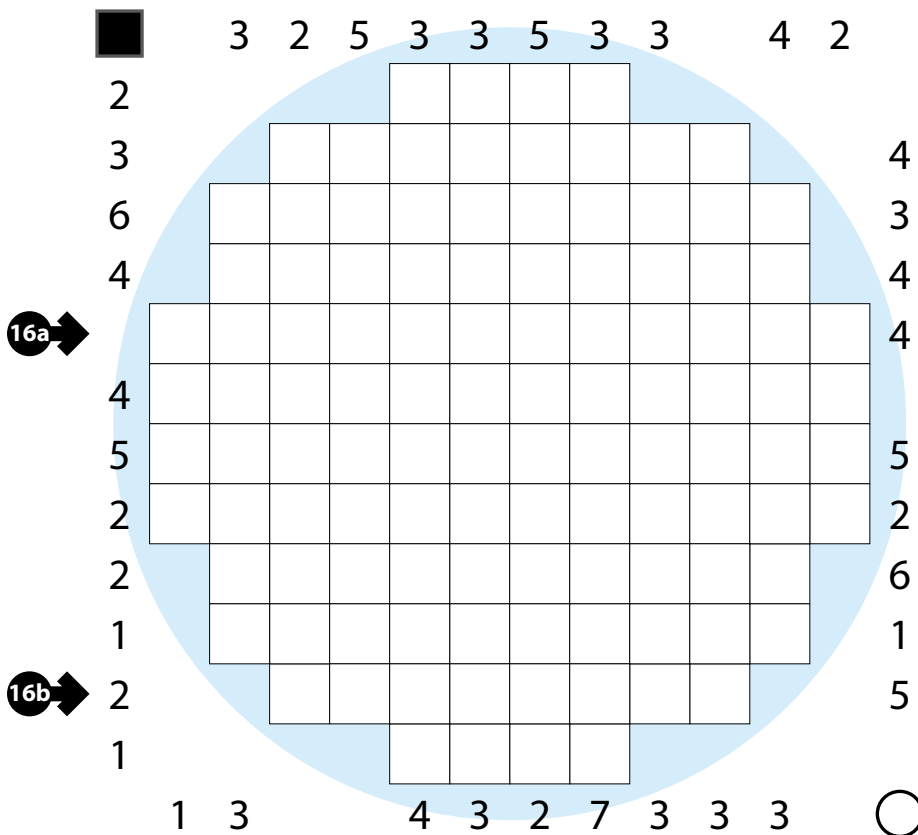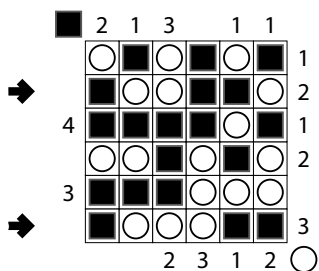
## 17. Wolves & Sheep Slitherlink [Markus Roth] (12 points)

Draw a single, non-intersecting loop that only consists of line segments between the dots along the dashed lines. A number inside a cell indicates how many of the edges of that cell are part of the loop. Cells marked with "w" (for "wolf") must be outside the loop; cells marked with "s" (for "sheep") must be inside the loop.

**Answer**: For each designated row, enter its contents from left to right. Use 'O' for a cell inside the loop and 'X' for a cell outside the loop. You may use two other characters, as long as they are distinct.

**Example Answer**: OOOO , OXOX

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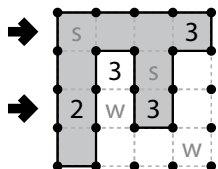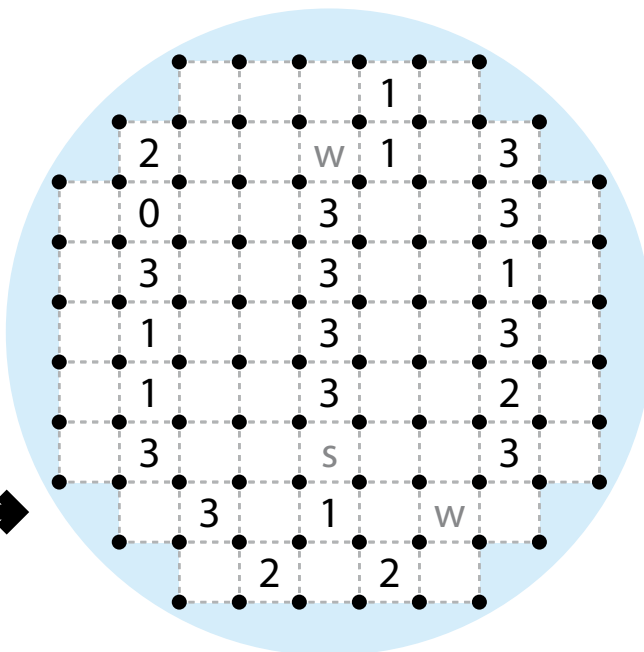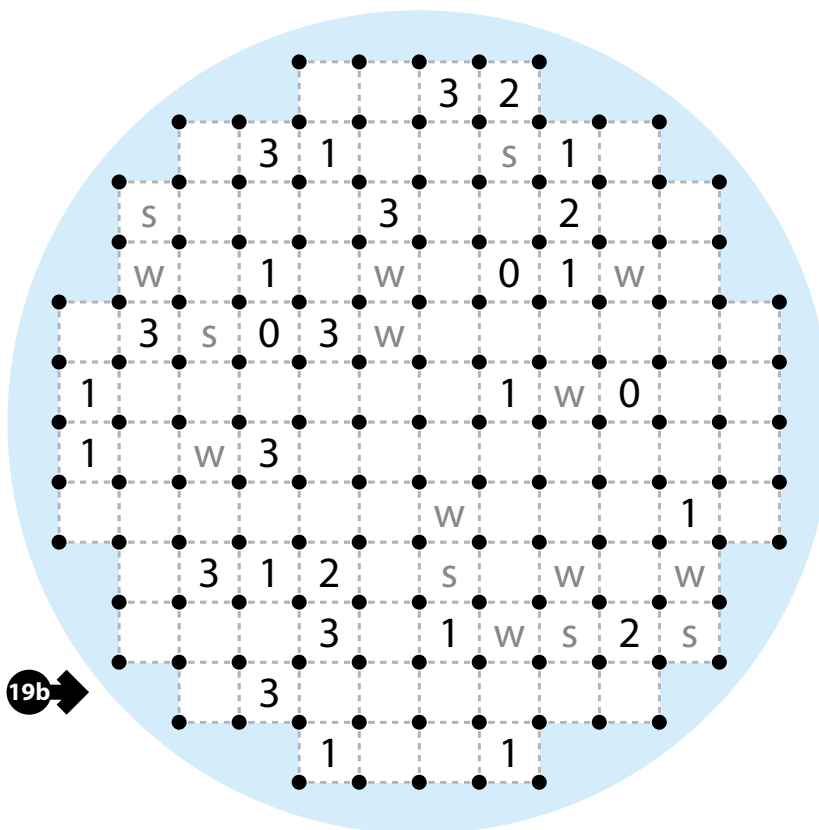
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## 18-19. Wolves & Sheep Slitherlink [Markus Roth] (21, 35 points)

**Answer**: For each designated row, enter its contents from left to right. Use 'O' for a cell inside the loop and 'X' for a cell outside the loop. You may use two other characters, as long as they are distinct.

**Example Answer**: OOOO , OXOX

**20-22. One to X [Markus Roth, Esther Naef, Esther Naef] (18, 42, 86 points)**

Place a number into each cell so that each outlined region contains the numbers from 1 to X, where X is the number of cells in the region. Cells containing the same number cannot share an edge. Some numbers may be already filled in the grid. A number outside the grid (when given) indicates the sum of all numbers in the grid along that row or column.

**Answer**: For each designated row, enter its contents from left to right (including any given numbers). Do not include any numbers outside the grid.

**Example Answer**: 241231, 412342

Example grid (top right):

| | 17 | 14 | | 14 | 20 |
|---|---|---|---|---|---|
| 17 | 4 | 2 | 3 | 1 | 4 | 3 |
| | 3 | 1 | 2 | 3 | 2 | 1 |
| | 1 | 5 | 3 | 4 | 3 | 4 |
| 13 | 3 | 1 | 2 | 1 | 4 | 2 |
| → | 2 | 4 | 1 | 2 | 3 | 1 |
| → | 4 | 1 | 2 | 3 | 4 | 2 |

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## 23-24. Rassi Silai [Markus Roth] (12, 21 points)

Within each region, find a single orthogonally-connected path (without intersections or crossings) through the centers of all cells. Cells that contain path endpoints must not share a corner or an edge (even if they belong to different regions). Some edges between cells might be marked with thick lines; paths cannot go through these lines.

*The displayed solution marks path endpoints and draws walls to indicate paths; you may use other notation as you wish.*

**Answer**: For each designated row, enter the letter for each cell, from left to right. The letter for a cell is 'I' if a path goes straight through the cell, 'L' if a path turns in the cell, and 'O' if a path has the cell as an endpoint. You may use other letters or numbers, as long as they are distinct.
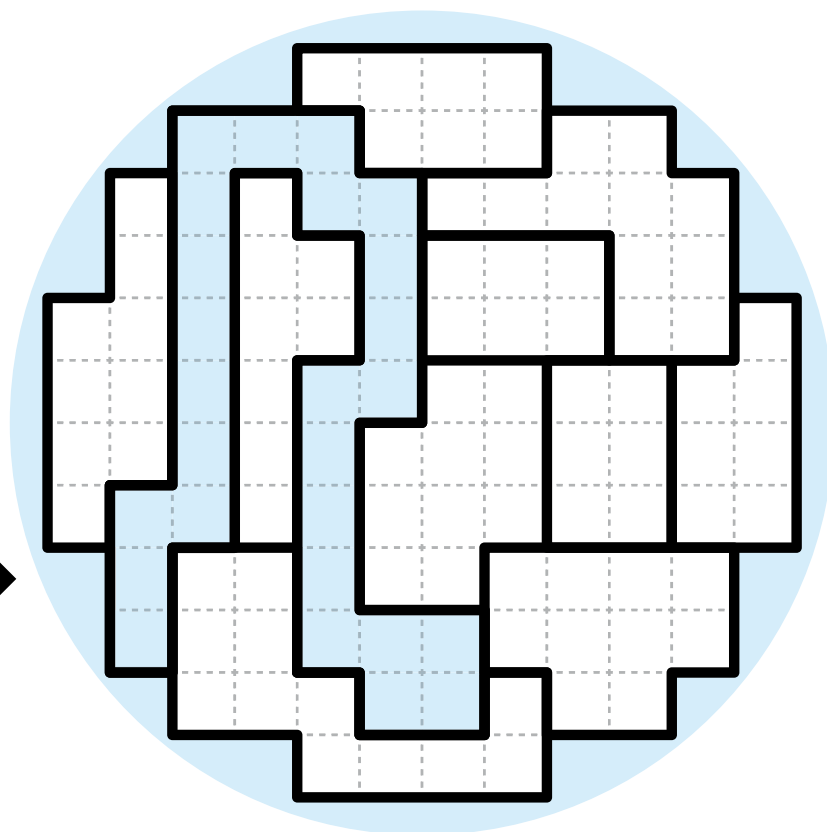
**Example Answer**: LOLOLL, OLILOL
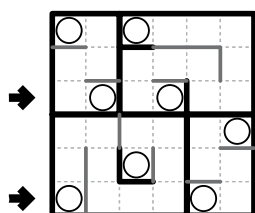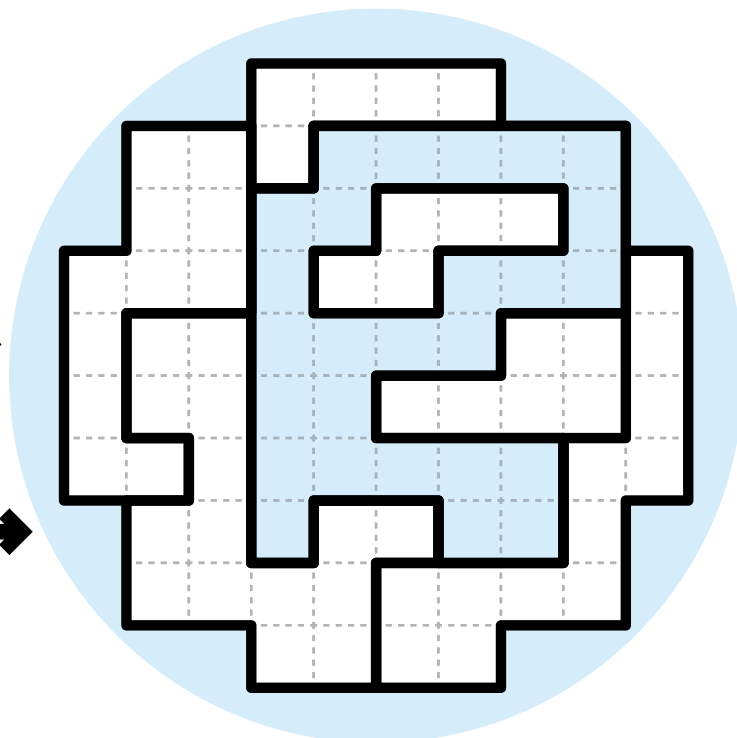
## 25-27. Loop (Pentomino Walls) [Markus Roth] (12, 24, 55 points)

Shade some cells, and draw a single loop that passes orthogonally through centers of cells.

The shaded cells must form the shapes of pentominoes (contiguous regions of five cells). Pentominoes cannot touch along edges or corners. One cell from each pentomino is given in the grid, and the shape of that pentomino is identified with the letter. The letter-to-shape correspondence for pentominoes has been supplied for you. Rotations and reflections of a pentomino are considered the same shape.

The loop must go through all unshaded cells and cannot go through any shaded cells. The loop cannot enter the same cell more than once.
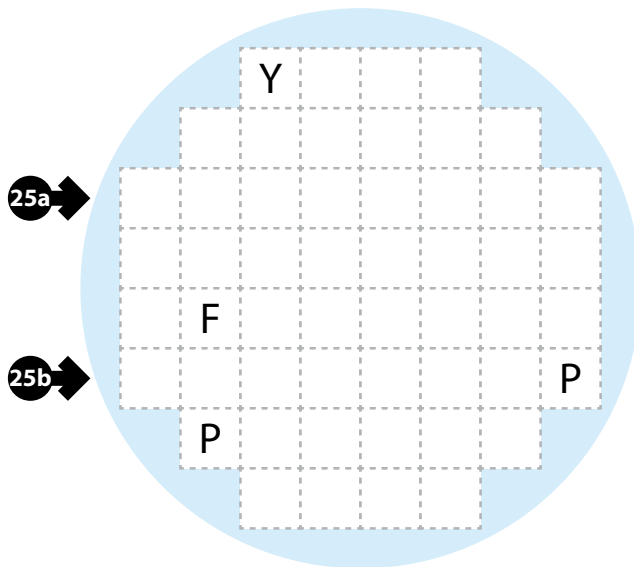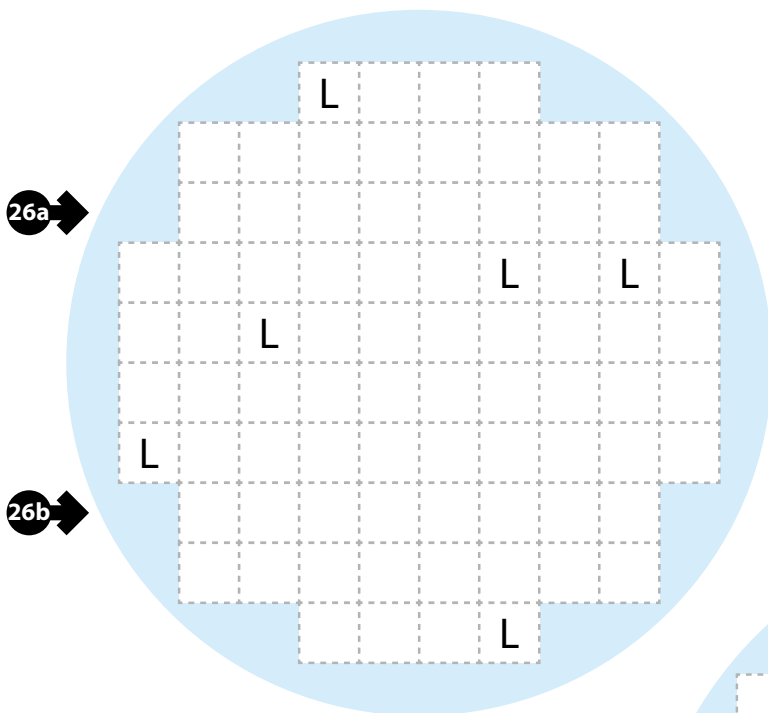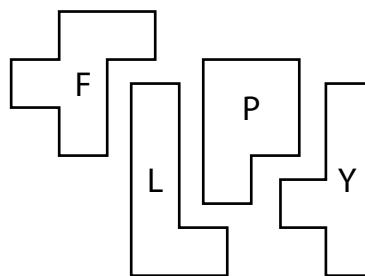
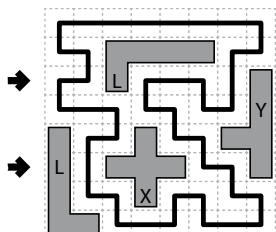**Answer**: For each designated row, enter the letter for each cell, from left to right. The letter for a cell is 'I' if the loop goes straight through the cell, 'L' if the loop turns in the cell, and 'X' if the cell is shaded. You may use three other letters or numbers, as long as they are distinct.
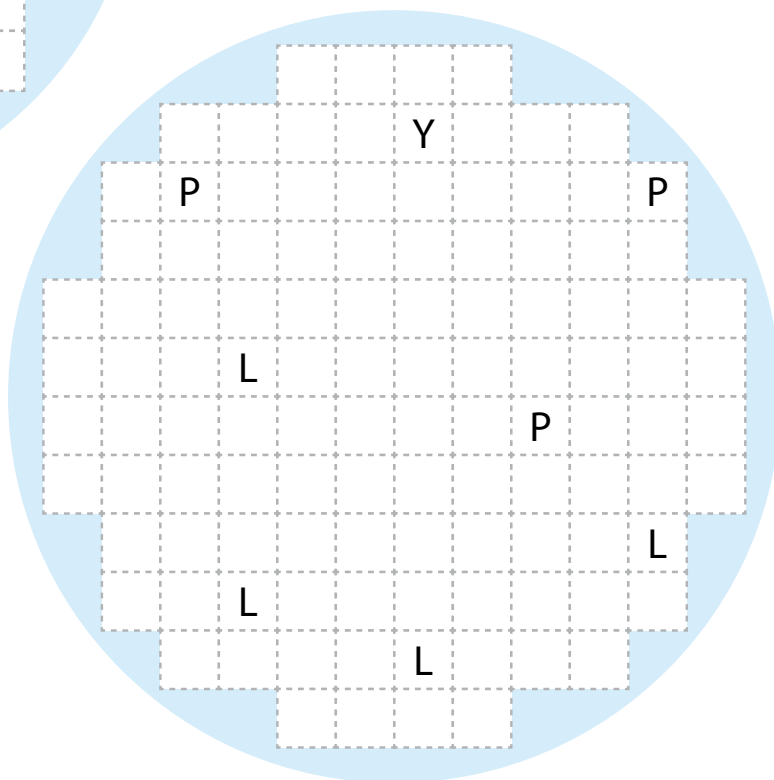
**Example Answer**:
LLXLILIX,XIXXXLLX

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## 28-30. Double-entry Loop [Markus Roth, Esther Naef, Esther Naef] (8, 35, 92 points)

Draw a single loop that passes orthogonally through the center of every cell. The loop cannot intersect itself or enter the same cell more than once.

The loop must enter (and exit) every outlined region exactly twice.

**Answer**: For each designated row, enter the letter for each cell, from left to right. The letter for a cell is 'I' if the path goes straight through the cell, and 'L' if the path turns in the cell. You may use other letters or numbers, as long as they are distinct.

**Example Answer**: ILIIIL, LLLLLL