WPF PUZZLE GP 2023
COMPETITION BOOKLET

Host Country: France

Aubin Danzo

Special Notes: None.

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1. Arithmetic Square (24 points)

Place the numbers from 1 to 9 into the cells (a different single number in each cell) so that the indicated equations/relations are correct. Evaluate from left-to-right and top-to-bottom (ignore the usual precedence of the operators).

It is possible for expressions and partial expressions to be negative or non-integral.

Answer: For each designated row, enter the contents of the cells, in order from left to right.

Example Answer: 987,643,521

2. Coins (19 points)

Place one coin into each cell such that the sum of the coin values in each row (and column) matches the number to the left (and the top). The valid values of coins are supplied with the puzzle; the same value may be used multiple times in each row (or column).

The size of the coins are only for cosmetic purposes. It is possible for any value to remain unused in the correct solution.

Answer: For each designated row, enter its contents from left to right. The content of each cell is the value of the coin in that cell.

Example Answer: 2052,221

Round 1

3. CrissCross (45 points)

Enter the given words in the grid, one character per cell. Each word appears exactly once, and will either read left-to-right or top-to-bottom. Some characters may already be given for you.

The circles in the diagram are for Answer purposes only. Note that the example puzzle has a square area that is not a cell and therefore not part of the grid.

Answer: Enter the characters in each of the circled cells, from left to right. (Ignore the row each circle is in. The characters will not necessarily spell anything meaningful.)

Example Answer: WOOT

```
0 0 0 0 0 0    1 0 1 1 1 0
0 0 1 0 1 0    1 1 0 0 0 1
0 0 1 0 1 1    1 1 0 0 1 0
0 0 1 1 1 1    1 1 0 1 0 0
0 1 0 1 1 1    1 1 0 1 0 1
0 1 1 0 0 1    1 1 1 0 1 1
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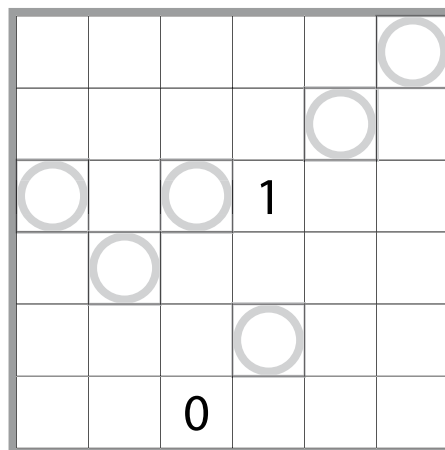
4. Battleships (17 points)

Locate the indicated fleet of ships in the grid. Ships may be rotated before being placed in the grid. Each piece of a ship occupies a single cell. A cell that does not contain a ship piece is considered "sea". Ships do not touch each other, not even diagonally (that is, if two ship pieces are in cells that share an edge or a corner, they must be part of the same ship). The contents of some cells are given for you (wavy lines indicate "sea").

Each number to the top or left of the grid reveals the number of ship pieces that must be located in that row or column (including any that might be given for you).

The numbers on the far top of the diagram are for Answer purposes only.

Answer: For each row from top to bottom, enter the number of the first column from the left where a ship piece appears (the number on the far top of that column). Use only the last digit for two-digit numbers; e.g., use '0' if the first ship piece appears in column 10. If the row is empty, enter '0'.

Example Answer: 1317171

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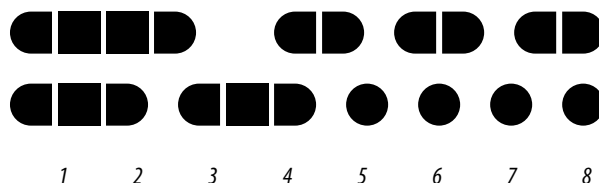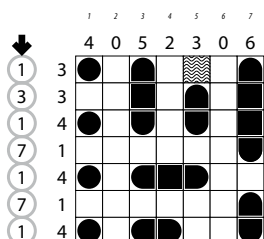
5. Tapa (46 points)

Shade some empty cells; cells with numbers cannot be shaded. All shaded cells connect along edges to create a single connected region. (It is permissible for the region to touch itself at a corner, but touching at a corner does not connect the region.) No 2×2 group of squares can be entirely shaded.

Numbers in a cell indicate the lengths of contiguous shaded cell groups along the "ring" of 8 cells touching that cell (fewer for cells along the outside edge). If there is more than one number in a cell, then there must be at least one white (unshaded) cell betwee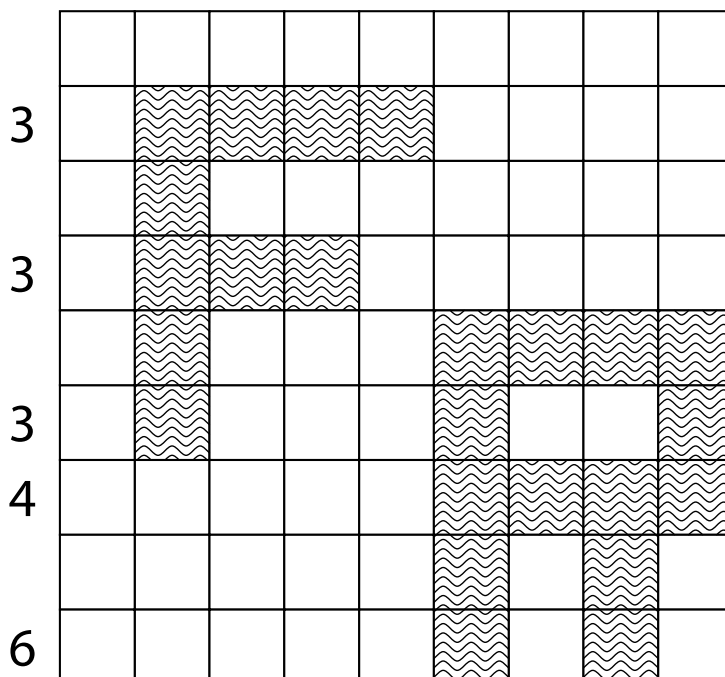n the shaded cell groups. The numbers are given in *no particular order*. As a special case, if the number given in a cell is a zero (0), it means that none of the cells around that cell can be shaded.

Answer: For each designated row, enter its contents from left to right. Use 'X' for an unshaded cell and 'O' for a shaded cell. You may use two other letters or numbers, as long as they are distinct.

Example Answer: XOOXOXOO, OOXOOOXO
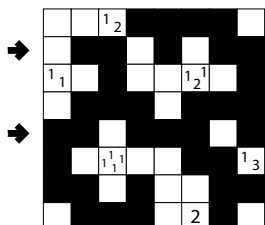
6. No Set in a Row (30 points)

Place a triangle, square, or circle into each empty cell, such that no row, column, or diagonal has three consecutive cells with the same symbol, and no row, column, or diagonal has three consecutive cells with all different symbols. Some cells have already been filled for you.

Answer: For each designated row, enter its contents from left to right. Use 'A' for a triangle, 'B' for a square, and 'C' for a circle. You may use three other letters or numbers, as long as they are distinct.

Example Answer: BBCC, ACCB

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7. Overlapping Squares (34 points)

Draw squares with side lengths in the specified list along the dotted grid lines. Each side length must be used exactly as many times as it appears in the list. Squares cannot share any part of their edges or corners, but may intersect each other. Each number given in a cell indicates the sum of the side lengths of the squares that contain that cell. (It is possible for a square to contain multiple numbers or no numbers at all.)
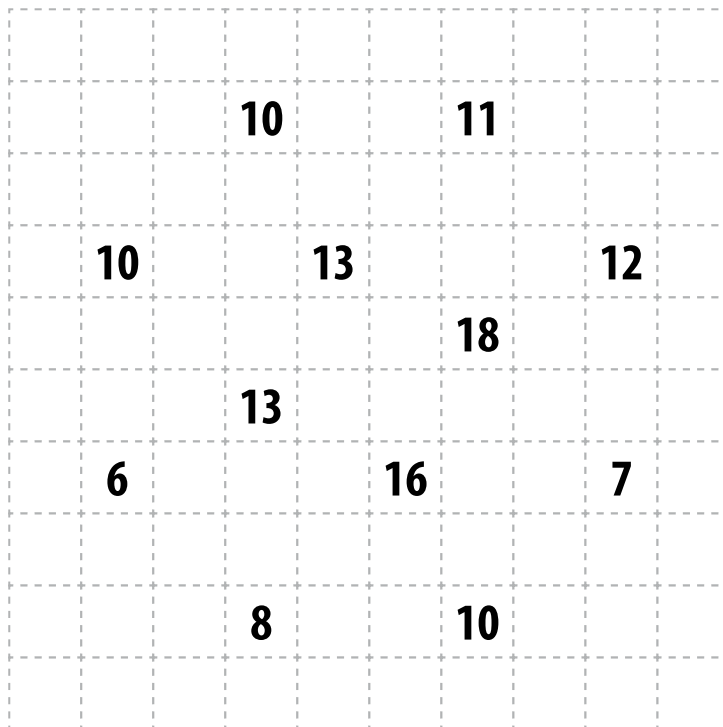
Answer: For each designated row, enter the number for each cell, from left to right. The number for a cell is the sum of the side lengths of the squares that contain that cell. Use only the last digit for two-digit numbers; e.g., use '0' for the number 10.

Example Answer: 5719940, 5565833

{1,2,3,4,5}

{1,2,3,4,5,6,7}
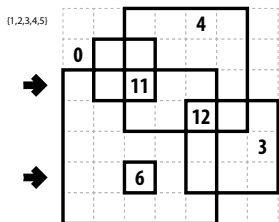
8. Spiral Galaxies (50 points)

Divide the grid into polyomino-shaped regions such that each cell is in exactly one region. You may only draw on the grid, along the indicated dotted lines. Each region must be rotationally symmetric and contain exactly one circle at the point of symmetry.

The letters inside the circles are for Answer purposes only.

Answer: For each designated row, enter the letter for each cell, from left to right. The letter of a cell is the letter inside the circle that is the point of symmetry for the region that contains that cell.

Example Answer: DCECC, DFEEE

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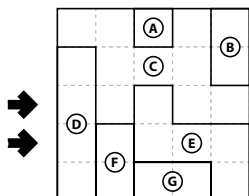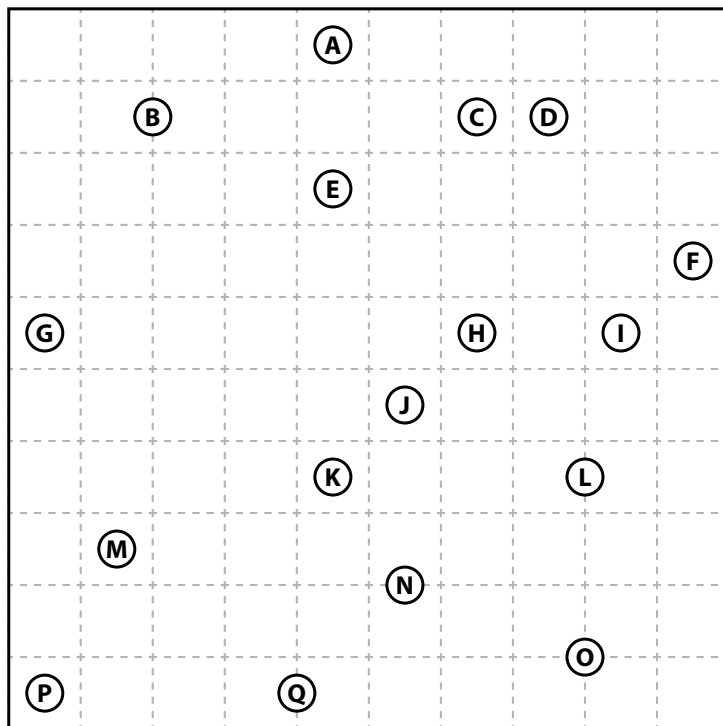
9. Japanese Sums (48 points)

Place a number from the specified list into some cells so that no number appears more than once in each row or column. Cells may remain empty. Numbers outside the grid indicate all sums of continuous groups of numbers (including "sums" of a single number) along that row or column, in positional order. These groups are separated by empty cells. A question mark (?) indicates an unspecified (but non-zero) sum. Some cells might be marked with a cross; do not put any numbers into those cells.

Answer: For each designated row, enter its contents, using 'X' for an empty cell. Do not include any numbers outside the grid.

Example Answer: 7X1X4,127X5

Example grid:

		3	11		6	
{1–7}		13	2	19	1	24
7	8	3	4		2	6
	18		7	5	4	2
→ 7 1	4	7		1	×	4
→ 10	5	1	2	7		5
5	14	5		6	1	7

Puzzle clues:

{1–6}

Top (3 rows of column clues):

		8			1		
6	9	?		?	6	7	
8	11	?	19	?	13	3	

Left row clues:
- ? ?
- (9a→) 8 ?
- (9b→) ? ? ?
- ? ? 4
- 15 ?
- 6 6 6
- 4 2 9
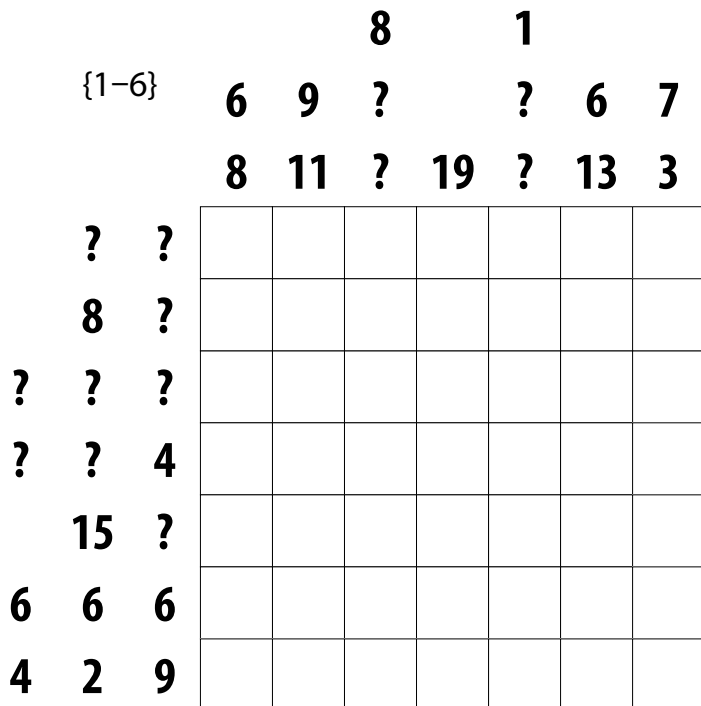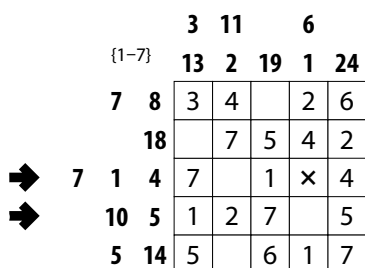
10. Masyu (42 points)

Draw a single loop that passes orthogonally through centers of cells. The loop must go through all circled cells. The loop may not intersect itself or enter the same cell more than once. The loop must go straight through the cells with white circles, with a turn in at least one of the cells immediately before or after each white circle. The loop must make a turn in all the black circles, but must go straight in both cells immediately before and after each black circle.

**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, 'L' if the path turns in the cell, and 'X' if the path does not go through the cell. You may use three other letters or numbers, as long as they are distinct.

Example Answer: LLXXX,LIILX

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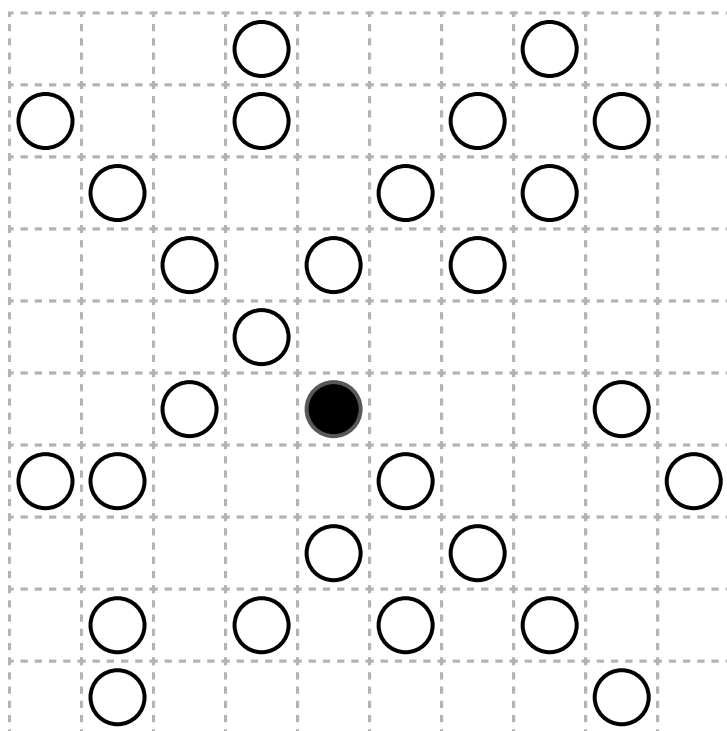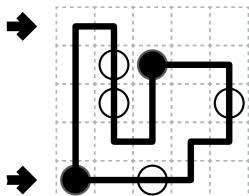
11. Tapa (Unknowns, Shape Division) (55 points)

Shade some empty cells; cells with numbers cannot be shaded. All shaded cells connect along edges to create a single connected region. (It is permissible for the region to touch itself at a corner, but touching at a corner does not connect the region.) No 2×2 group of squares can be entirely shaded.

Numbers in a cell indicate the lengths of contiguous shaded cell groups along the "ring" of 8 cells touching that cell (fewer for cells along the outside edge). If there is more than one number in a cell, then there must be at least one white (unshaded) cell between the shaded cell groups. The numbers are given in *no particular order*. As a special case, if the number given in a cell is a zero (0), it means that none of the cells around that cell can be shaded.

Some numbers have been replaced with question marks ('?'). Ignore the arrangment of numbers; for example, a "? 2" could be a "1 2", "2 2", or "3 2". If there is more than one number or question mark in a cell, none of them can be zero (0).

The shape formed by all unshaded cells (including cells with numbers in them) is congruent to the shape formed by all shaded cells. (Congruent shapes have the same shape and size but may be rotated and/or reflected.)

Answer: For each designated row, enter its contents from left to right. Use 'X' for an unshaded cell and 'O' for a shaded cell. You may use two other letters or numbers, as long as they are distinct.

Example Answer: XOOOXO, XOXOXO

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12. Balance Loop (54 points)

Draw a single loop that passes orthogonally through centers of cells. The loop may not intersect itself or enter the same cell more than once.

The loop must go through all cells with a symbol or number. For each cell on the loop, consider an "arm" to be the loop segment between the center of that cell and the next or previous turn in the loop; each cell therefore has two arms. A white square in a cell indicates that its two arms are of equal length; A black circle in a cell indicates that its two arms are of unequal length. A number in a cell indicates the sum of the lengths of its two arms.

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, 'L' if the path turns in the cell, and 'X' if the path does not go through the cell. You may use three other letters or numbers, as long as they are distinct.

Example Answer: LLIILL, IXLLXI

13. Yajilin (Regions) (41 points)

Shade some cells so that you can draw a single closed loop (without intersections or crossings) through all remaining unshaded cells. Loop paths must be orthogonal. Shaded cells cannot share an edge with each other. The grid is divided into regions by thick borders; a number in a region indicates exactly how many cells in that region must be shaded. Cells with a number in it may be shaded (this does not affect its value as a clue). The number of shaded cells for a region without a number is for you to determine.

The numbers on top of the diagram are for Answer purposes only.

Answer: For each row from top to bottom, enter the column number of the left-most shaded cell. Use only the last digit for two-digit numbers; e.g., use '0' for column 10. If none of the cells in a row are shaded, enter '0' for that row.

Example Answer: 625324

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14. Countries (91 points)

Divide the grid into regions. Each region is orthogonally connected and contains exactly one of the given letters. A number outside the grid represents the number of cells in that row (or column) that are in the same region as the cell adjacent to that number, including the cell itself.

The selection of letters has no meaning in this puzzle and is used only for aesthetics and answer entry purposes. Unlike the original appearances of this puzzle type in WPC 2008 and WPC 2016, there is no constraint that each region must touch the outer edge.

14a ➤

14b ➤

Answer: For each designated row, enter the letter corresponding to the region the cell belongs to, from left to right.

Example Answer: ABBBBBDD , CAAACDCD
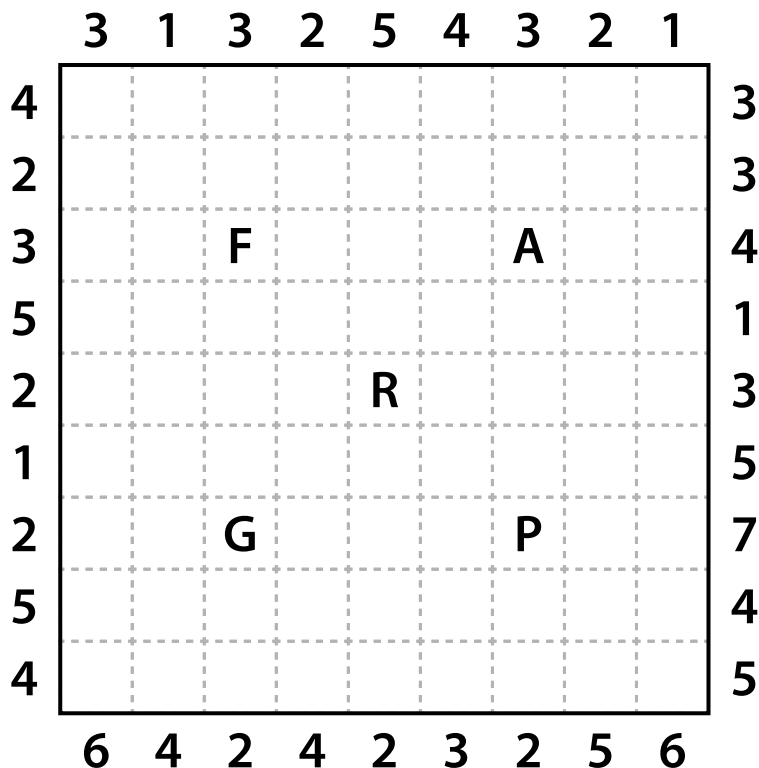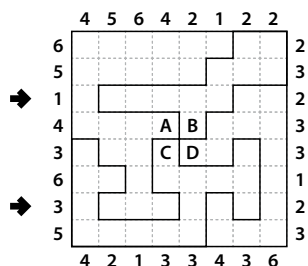
15. Ham Sandwiches (83 points)

Place ham and bread symbols into cells, no more than one symbol per cell, so that the given (multi)set of symbols appears in each row and column. The numbers outside the grid indicate the number of hams that are between the first two breads seen in the respective row or column from the respective direction. Some symbols may already be filled in for you. Some cells might be marked with a cross; do not put any symbols into those cells.

15a ➤

15b ➤

Answer: For each designated row, enter its contents. Use 'H' for ham, 'B' for bread, and 'X' for an empty cell. Do *not* include any numbers outside the grid. You may use other letters or numbers, as long as they are distinct.

Example Answer: HXBHBH , BHBXHH