



WPF PUZZLE GP 2023 COMPETITION BOOKLET

Host Country: Switzerland

Esther Naef, Markus Roth, Test Solving: Roger Kohler

Special Notes: This round celebrates Walpurgis Night, with themes of runes and Norse mythology. Themes are printed under some puzzles, but are not needed to solve them.

1-2. Arithmetic Square [Markus Roth] (17, 11 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

$$\begin{aligned} \rightarrow & \begin{array}{ccc} \boxed{9} & + & \boxed{8} & + & \boxed{7} & > & 23 \\ & + & - & + & & & \\ \rightarrow & \begin{array}{ccc} \boxed{6} & \times & \boxed{4} & \div & \boxed{3} & = & 8 \\ & \times & \times & - & & & \\ \rightarrow & \begin{array}{ccc} \boxed{5} & \times & \boxed{2} & + & \boxed{1} & = & 11 \\ & = & = & = & & & \\ & 75 & 8 & 9 & & & \end{array} \end{array} \end{aligned}$$

$$\text{1a} \rightarrow \begin{array}{ccccccc} \boxed{} & + & \boxed{} & \div & \boxed{} & = & 1 \\ & + & + & \times & & & \end{array}$$

$$\text{1b} \rightarrow \begin{array}{ccccccc} \boxed{} & - & \boxed{} & + & \boxed{} & = & 5 \\ & \times & - & + & & & \end{array}$$

$$\text{1c} \rightarrow \begin{array}{ccccccc} \boxed{} & \times & \boxed{} & - & \boxed{} & = & 23 \\ = & = & = & & & & \\ 28 & 4 & 23 & & & & \end{array}$$

$$\text{2a} \rightarrow \begin{array}{ccccccc} \boxed{} & + & \boxed{} & - & \boxed{} & = & 1 \\ & \times & - & \times & & & \end{array}$$

$$\text{2b} \rightarrow \begin{array}{ccccccc} \boxed{} & + & \boxed{} & - & \boxed{} & = & 5 \\ - & + & - & & & & \end{array}$$

$$\text{2c} \rightarrow \begin{array}{ccccccc} \boxed{} & \times & \boxed{} & + & \boxed{} & = & 23 \\ = & = & = & & & & \\ 28 & 4 & 23 & & & & \end{array}$$

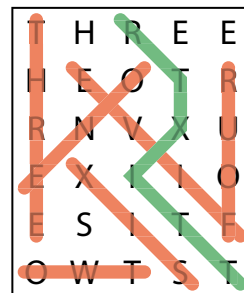


3. Word Search (Remaining Path) [Markus Roth] (46 points)

Locate the list of words in the grid and find a path of letters.

Words always appear in a line in one of the eight standard directions. Some words may appear multiple times in the grid; one copy of the word needs to be located, while the others are decoys. The located words may not use any letters on the path.

The path starts at a letter in the top row, goes through adjacent letters in the eight standard directions, and ends at a letter in the bottom row. If there are multiple such paths, find one that passes through the fewest number of letters; any of those will be considered correct.



Answer: Enter the letters along the path you found.

Example Answer: RTXITT or ETXITT

- B I R I T H
- E H O
- F E H C
- G I B U
- G I L C H
- H A G A L E
- H E L A H E
- H I S
- H U R
- H U Y R I
- K H E N
- K H O N
- L A G U
- M A N
- N O T
- O T H I L
- P E R C H
- R E H I T
- S U H I L
- T A C
- T H O R N
- Z I U

3

F	E	C	H	T	I	R	I	B	E
S	L	T	A	F	O	H	E	S	H
H	U	I	E	T	U	T	I	G	A
U	A	H	H	B	E	H	O	H	L
Y	C	G	I	T	C	O	U	P	E
R	U	G	A	L	O	R	G	E	H
I	O	I	I	L	Y	N	A	R	N
L	N	G	Z	I	E	H	O	C	E
C	A	Z	I	U	H	U	R	H	H
H	M	R	E	H	I	T	A	C	K

Marcomannic Runes



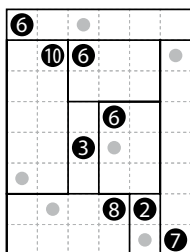
4-5. Shikaku [Markus Roth] (12, 23 points)

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 number. The number must equal the area of the rectangle (in cells).

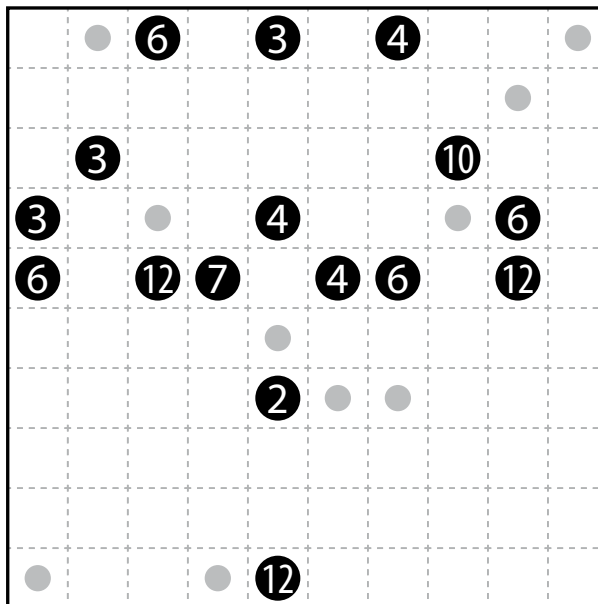
The dots in cells are only used for entering your answers.

Answer: Enter the number in 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 a 10 inside it.

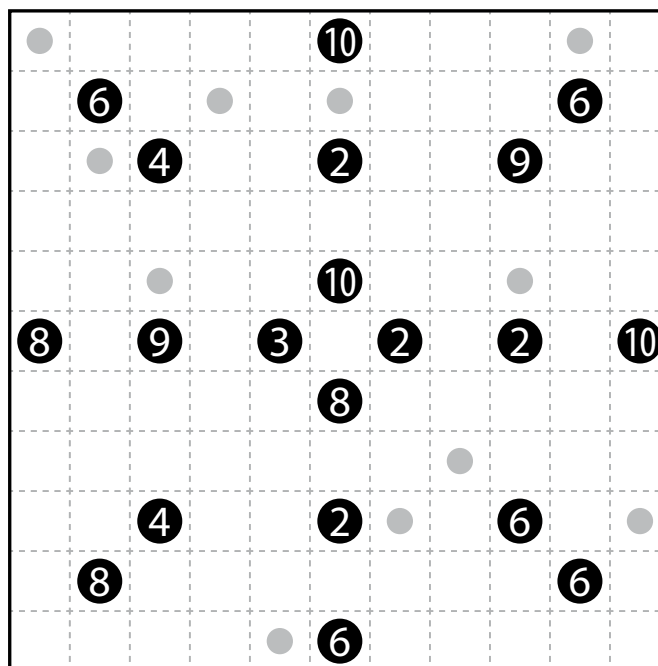
Example Answer: 086627



→ 0 8 6 6 2 7



Lammas



Sun



6-7. Infection [Markus Roth] (22, 43 points)

Fill some cells with a number from 1 to 4. All numbered cells must be orthogonally connected. 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

→	1				x
→	2	3	2	3	2
→		2		2	3
	1	4	1		2
		1			1

6a →

2							2
	2						2
		2	4	2	4	2	
	1	3				4	1
1							1
2							2
3							3
	4						3
		3				x	

6b →

Horned God

7a →

	1						1
		3				3	
	3		3		3		1
				3			
	2						1
				1			
	3		2		1		3
		3				3	
	1						3

7b →

Stone

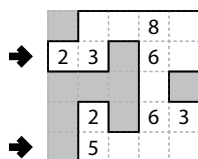


8-9. Cave [Markus Roth] (35, 51 points)

Shade some cells to leave behind a single orthogonally-connected group—the cave—with no shaded cells enclosed within the cave. In other words, all shaded cells must be connected edge-wise by other shaded cells to an edge of the grid. All numbered cells must be a part of the cave (and therefore not shaded). Each number indicates the total count of unshaded cells connected in line vertically and horizontally to the numbered cell including the cell itself.

Answer: For each designated row, enter its contents from left to right. Use 'o' for an (unshaded) cell occupied by the cave and 'x' for a (shaded) cell not occupied by the cave. You may use two other letters or numbers, as long as they are distinct.

Example Answer: ooxoo, xoooo



8a →

8b →

			5			3			
		3		3	5			5	5
8						5			
									2
	10			10			11		
2							2		
		8							4
						7		2	
9	6	7		8	7				
			4			6			
			7	4		6		4	2

Birds

9a →

9b →

	2			6			4	5	
						4			
		2		5					
			6			8			
	5						6	8	
5			3				4		
				5	10				
								3	
			2			3			8
	3	7				7	3		

Insect

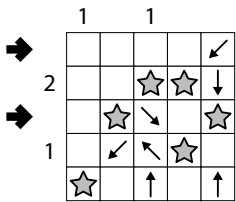


10-11. Starry Sky (One or More) [Esther Naef] (48, 70 points)

Place stars into some empty cells, no more than one star per cell, such that each arrow is pointing toward one or more stars, and each star is pointed to by one or more arrows. Numbers to the left of and above the grid indicate the number of stars in that row or column, respectively.

Answer: For each designated row, enter its contents, from left to right. Use 'o' for a cell with a star and 'x' for a cell without a star. You may use two other characters, as long as they are distinct.

Example Answer: XXXXX, XOXOXO



	2	2	2	2	2	2	1	2
2				↙	←			
								←
3					←		↗	←
				↖		↘		↓
				↖	←		↘	↖
2				←		→		
2					↙	→		↓
3					↑	→		↑

10a →

10b →

	2	2	3	1	2	2	3	2
1								
3			←			→		
1				↓		↖		
2		↑	↗		←	↑		↖
		↘	→			↗	↓	↘
2	↘		↑					
3				↑	↗		↓	↓
2	↖			↑		↗	↑	
2				↖	←			
2			←	↖			↖	

11a →

11b →

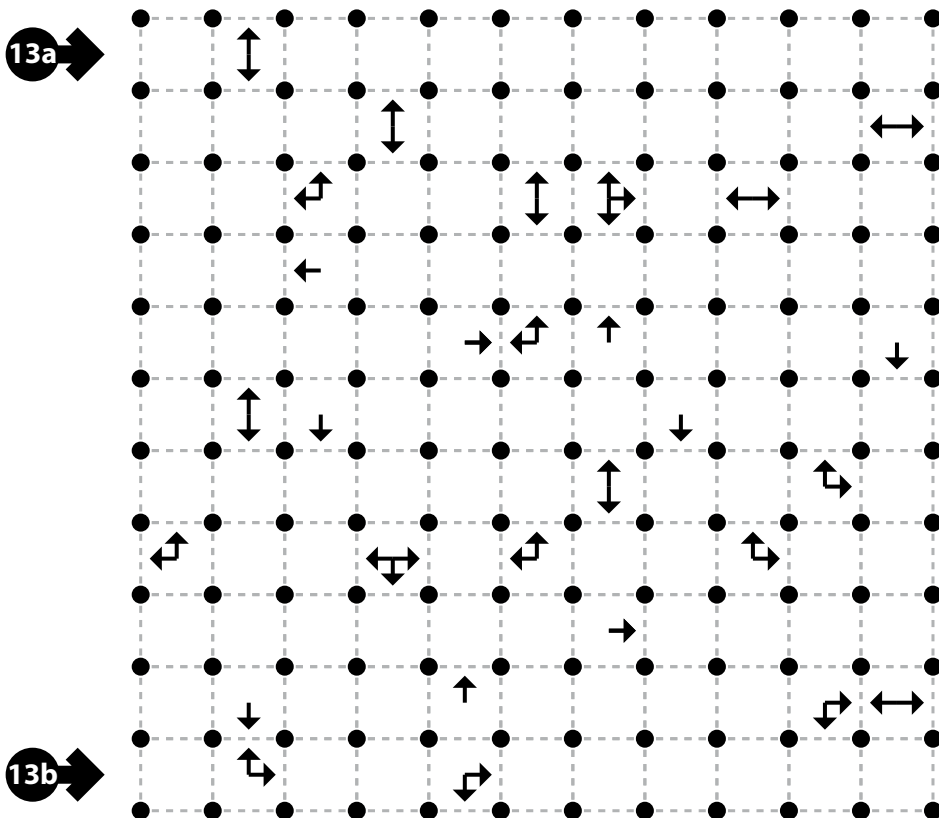
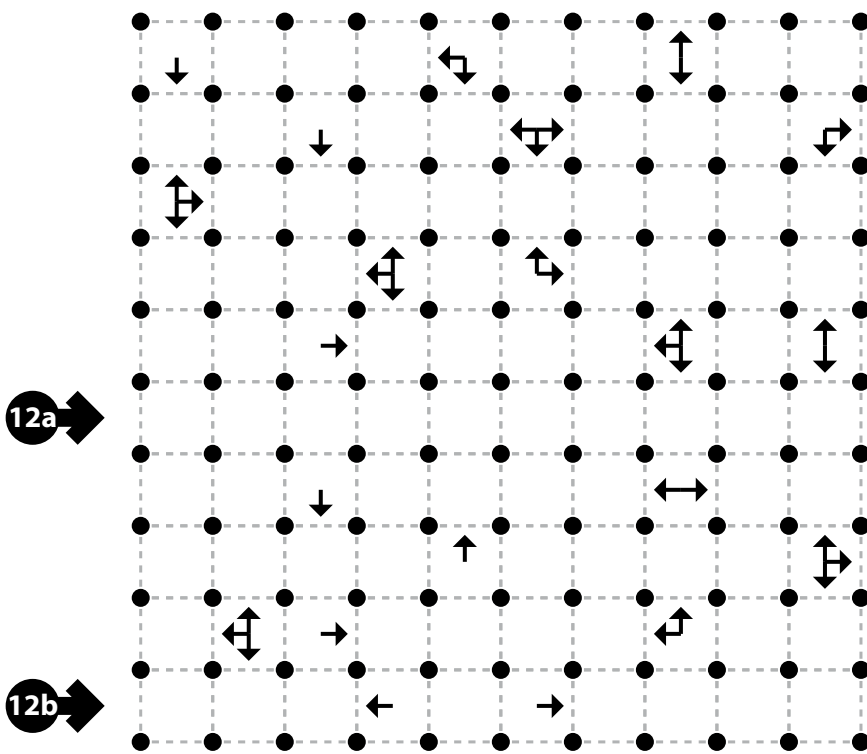
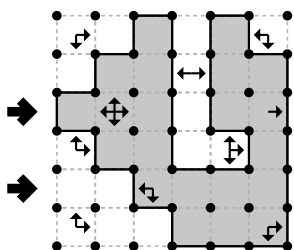


12-13. Myopia [Markus Roth] (56, 81 points)

Draw a single, non-intersecting loop that only consists of orthogonal line segments between the dots. Arrows in a cell indicate *all* closest loop edges to that cell along the four orthogonal directions (if there are multiple loop edges of the same closest distance to the cell, there will be multiple arrows).

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.

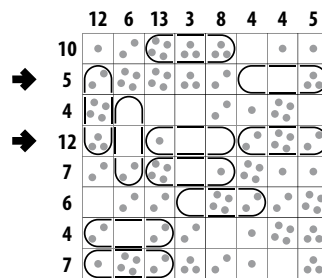
Example Answer: oooxoo, xxoooo



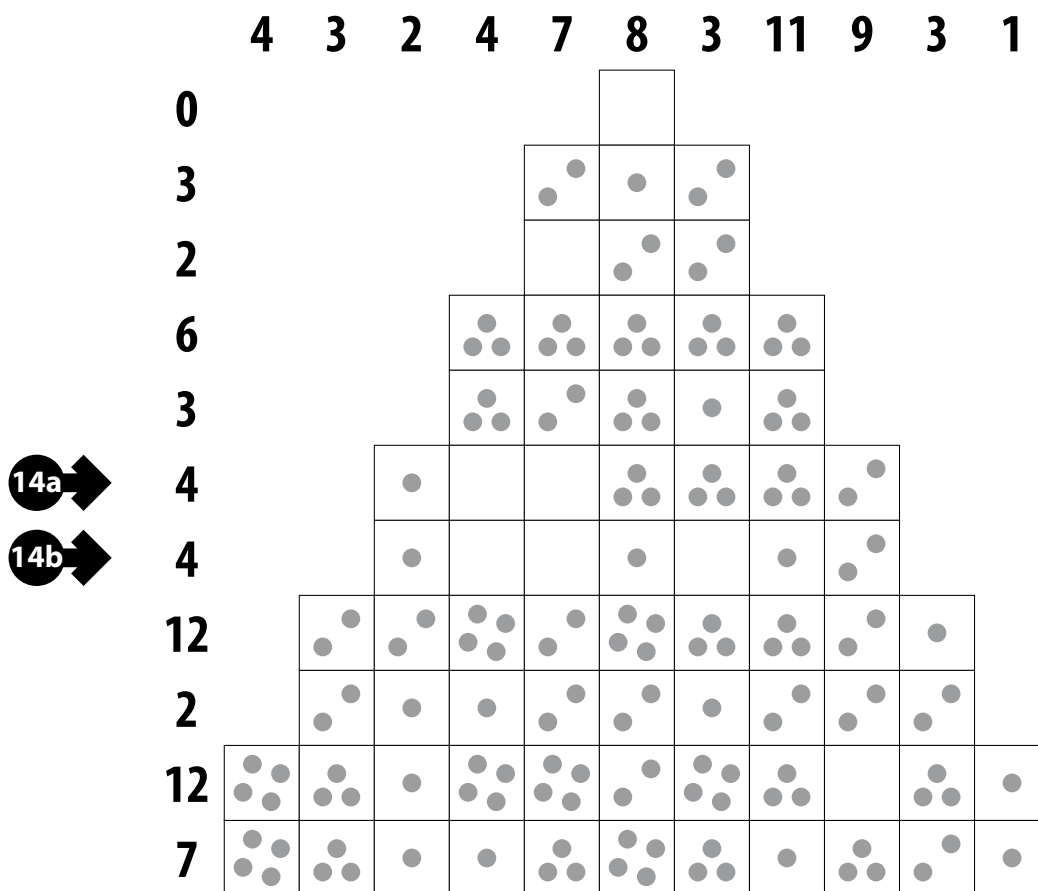
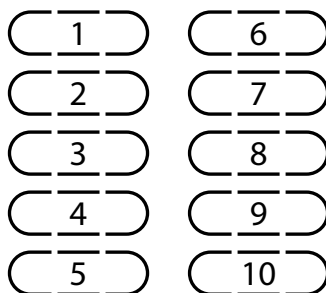
14. Pills [Markus Roth] (29 points)

Locate the indicated set of pills in the grid. Pills have a 1x3 or 3x1 shape and do not overlap each other. Each pill has a different "value" (number of dots inside the pill), as indicated to the right of the grid. Each number to the left and top of the grid reveals the number of dots in that row or column that are inside pills, respectively.

Answer: For each designated row, enter the pill value for each cell from left to right. (If the cell is inside a pill, enter the value of that pill; if the cell is not inside a pill, enter '0'.) Use only the last digit for two-digit numbers; e.g., use '0' for a pill of value 10.



Example Answer: 90000333, 92111888



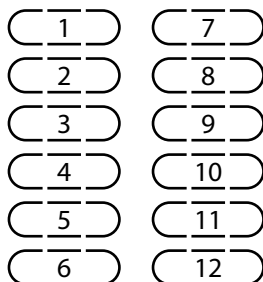
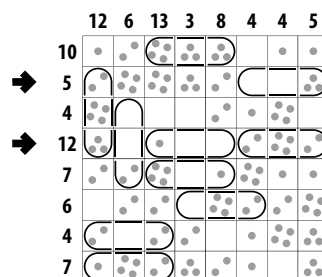
Fire



15. Pills [Markus Roth] (35 points)

Answer: For each designated row, enter the pill value for each cell from left to right. (If the cell is inside a pill, enter the value of that pill; if the cell is not inside a pill, enter '0'.) Use only the last digit for two-digit numbers; e.g., use '0' for a pill of value 10.

Example Answer: 900003333, 92111888



		2	2	6	4	6	7	13	5	14	7	4	4	4
15a →	7	● ●	● ●	● ●	●	● ●	● ●	● ●	●			● ●	● ●	● ●
	14	● ●	● ●	●	●	● ●	●	●	● ●	●	● ●	● ●	● ●	● ●
	4		●	● ●	● ●	●		● ●	● ●	● ●	● ●	●	● ●	
	3		●	● ●	●	●	●	● ●	●	●	●	●	● ●	
15b →	7		●	● ●	● ●			●	● ●	● ●	● ●			
	14		● ●	● ●	● ●	● ●	● ●	● ●	● ●	● ●	● ●	● ●	● ●	
	2		●	●			●		●					
	4		● ●	● ●	● ●	●	● ●				● ●			
	13			● ●	● ●	● ●	● ●	● ●	● ●					
	2			● ●	●	● ●	●	● ●		● ●				
	4			● ●	● ●	● ●	● ●	● ●						
	4			● ●	● ●	● ●	● ●	● ●						
	0													

Water



16-17. Star Myopia [Esther Naef] (25, 40 points)

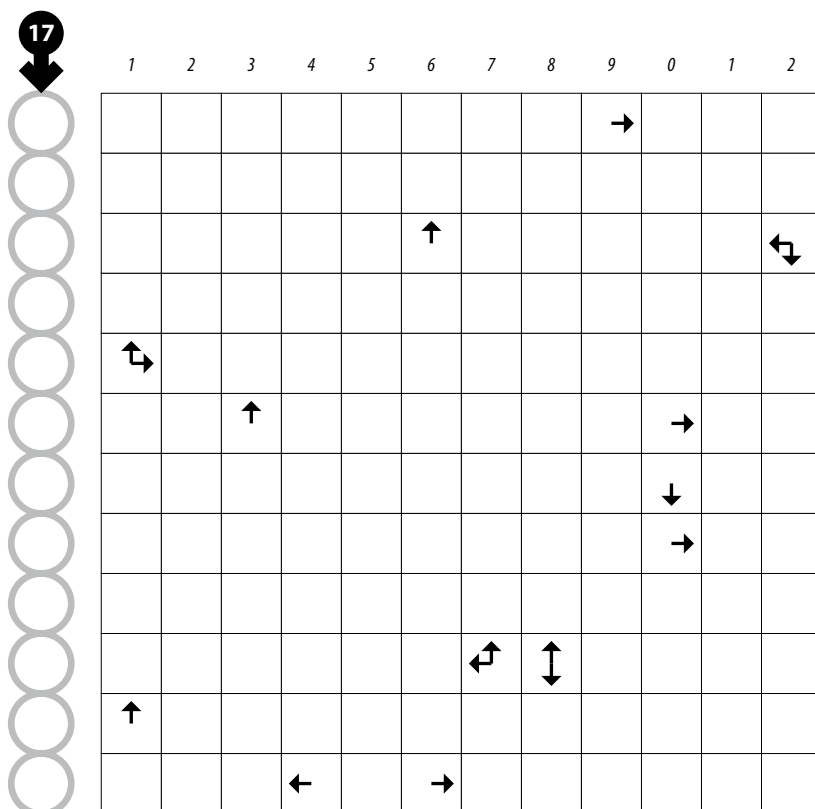
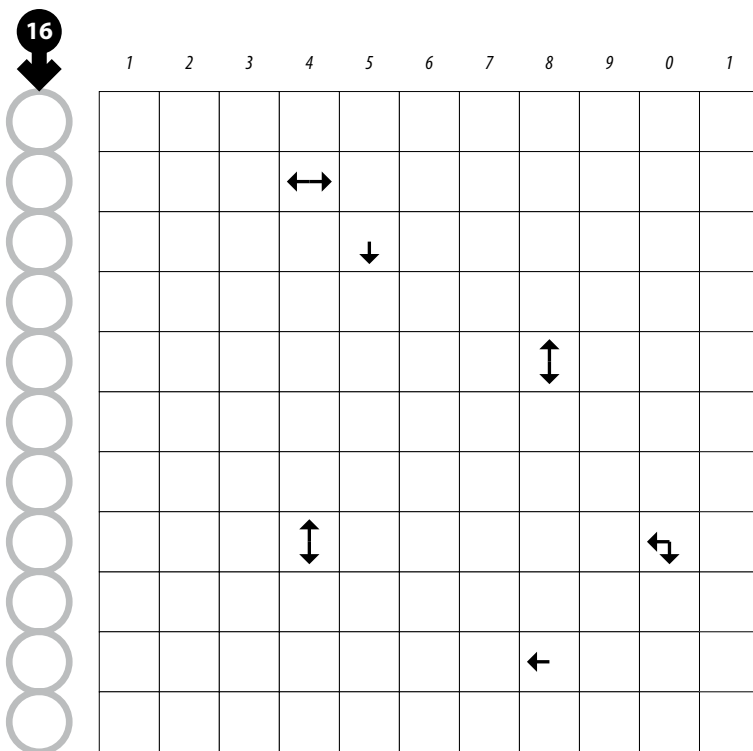
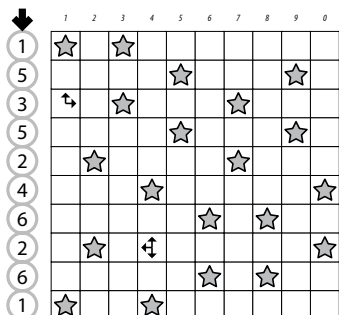
Place stars into some empty cells in the grid, no more than one star per cell. Each row and each column must contain exactly two stars. Cells with stars may not touch each other along an edge or a corner.

Arrows in a cell indicate *all* closest stars to that cell along the four orthogonal directions (if there are multiple stars of the same closest distance to the cell, there will be multiple arrows).

The numbers on 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 star appears (the number on top of that column). Use only the last digit for two-digit numbers; e.g., use '0' if the first star appears in column 10.

Example Answer: 1535246261

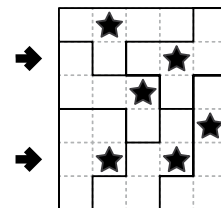




18. Pentomino Division (Internal Star) [Esther Naef] (35 points)

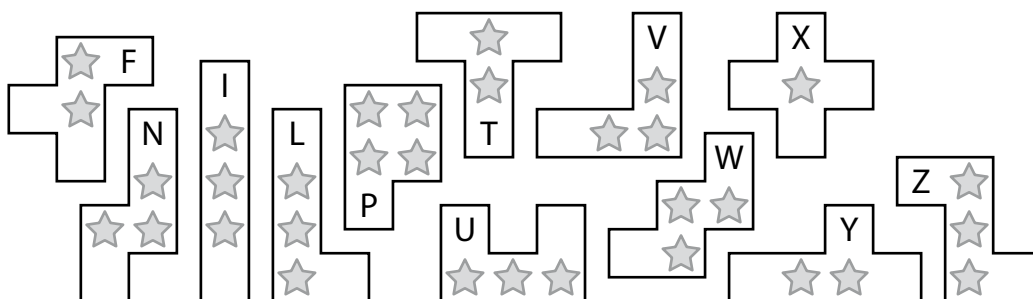
Divide the grid into pentominoes such that every cell in the grid is part of exactly one pentomino. You may not have more than one pentomino of the same shape (rotations and reflections of a pentomino count as the same shape). Each pentomino must contain exactly one star. The star must be in an internal cell of the pentomino (an internal cell is a cell orthogonally adjacent to at least two other cells of the pentomino). Some pentomino borders are already given for you in the grid.

A list of pentominoes is provided, with each pentomino's internal cells marked with a star for your convenience. The letters for the shapes of the pentominoes are only used for entering your answer.



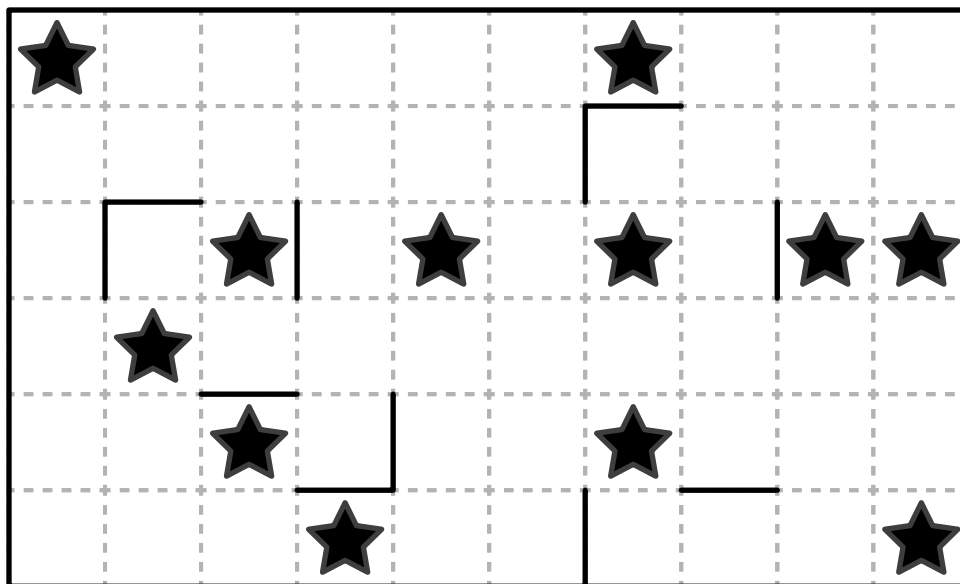
Answer: For each designated row, enter the letter for the pentomino that each cell belongs to, from left to right.

Example Answer: ZYFFF, PPWWL



18a →

18b →

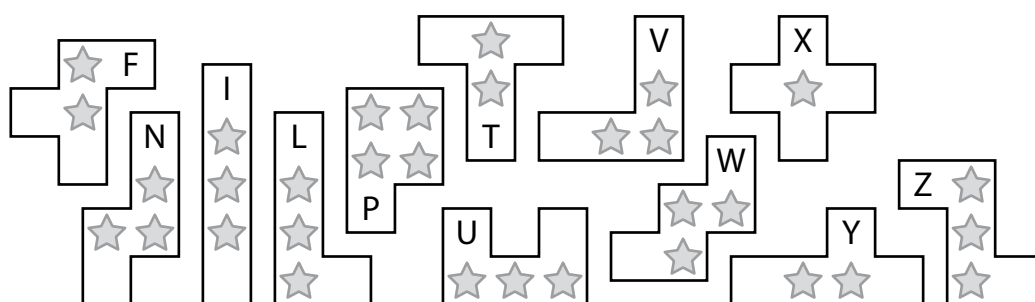
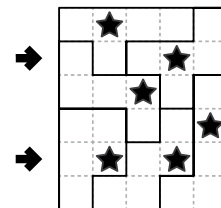




19. Pentomino Division (Internal Star) [Esther Naef] (43 points)

Answer: For each designated row, enter the letter for the pentomino that each cell belongs to, from left to right.

Example Answer: ZYFFF, PPWWL



19a →

19b →

