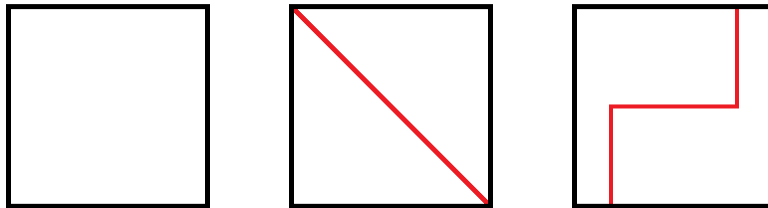


Puzzle Rules

Cut A Part

In each puzzle, cut the provided shape into the specified number of congruent pieces. If there are multiple correct answers to a puzzle, all correct answers will be accepted.

Example: Cut the square on the left into **2** congruent pieces.



Both of the above solutions would be accepted (among many others).

Separators

Place the digits $1, 2, 3, \dots, N$ into the $2N \times 2N$ grid such that there are two 1s, two 2s, two 3s, \dots and two N s in each row and column. The numbers to the left and top of the grid (in the light grey area) indicate the distances between pairs of digits; for example, if a row (on a puzzle with $N = 2$) has the numbers “2 0” to the left of it, then the 1s on that row have exactly two squares between them, and the 2s on that row have exactly zero squares between them (in other words, they are adjacent). As another example, if a column (of a puzzle where $N = 3$) has the numbers “_ 1 2” above it, then the 2s on that column have exactly one square between them, and the 3s on that column have exactly two squares between them; you don’t know how many squares are between the 1s on that column.

1	2	1	0	1	0
0	0	1	0	1	0
0	2				
2	0				
0	0				

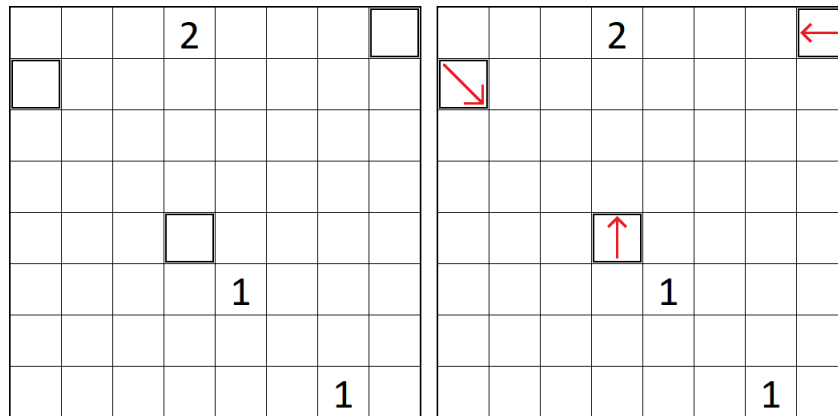
1	2	1	0	1	0
0	0	1	1	2	2
0	2	2	1	1	2
2	0	1	2	2	1
0	0	2	2	1	1

Hint: Start with the columns and rows containing the largest numbers, and work your way from there.

Arrows

Each boxed square contains exactly one arrow which points either horizontally, vertically, or diagonally. (There are 8 possible directions.) Place arrows in all of the boxed squares such that:

- The squares containing numbers have that many arrows pointing to that square.
- Each arrow points to at least one number.



As shown in the example, a single arrow can point to multiple numbers, and arrows can point “through” other arrows.

General Tips

Within each section, the puzzles are roughly ordered by difficulty. As such, it may be better to try to solve easier puzzles before tackling harder ones. Good luck and have fun!

Team Name: _____

Team ID: _____

BmMT 2019 Puzzle Round

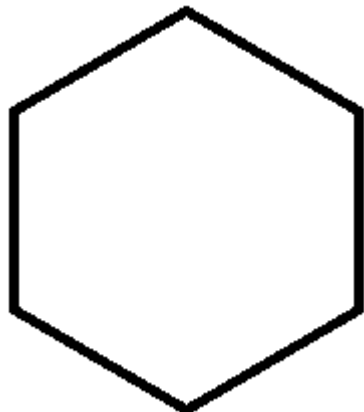
PLEASE DO NOT WRITE ON THIS SHEET. THIS IS FOR GRADING PURPOSES ONLY.

DO NOT TEAR OFF THIS PAGE OR ANY OTHER PAGES FROM THE PACKET YOU WISH TO SUBMIT.

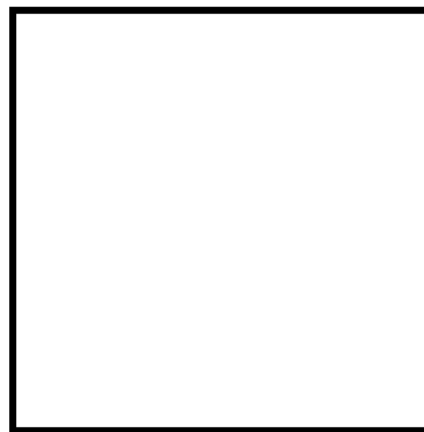
Problem 1	Problem 2	Problem 3
Problem 4	Problem 5	Problem 6
Problem 7	Problem 8	Problem 9
Problem 10	Problem 11	Problem 12
Problem 13	Problem 14	Problem 15

1 Cut A Part

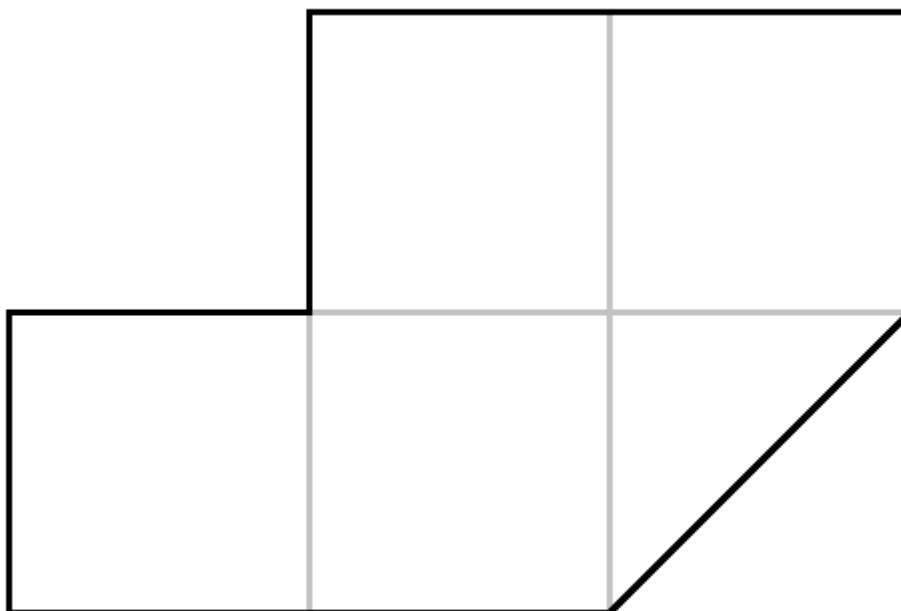
1. [3 points] Cut this regular hexagon into **6** congruent pieces.



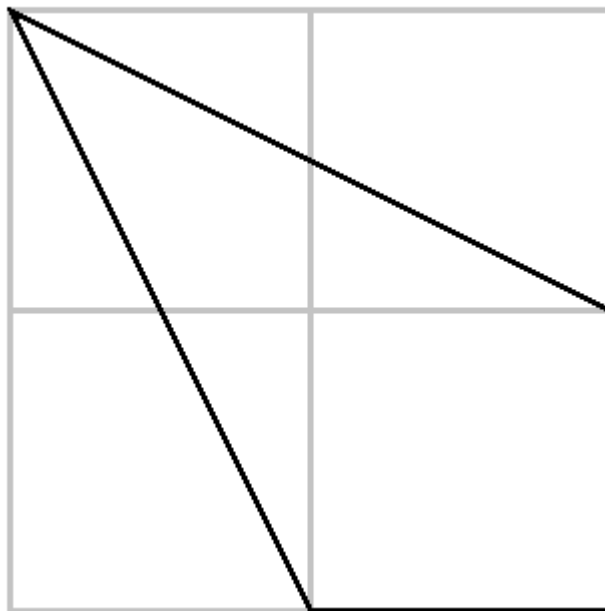
2. [5 points] Cut this square into **5** congruent pieces.



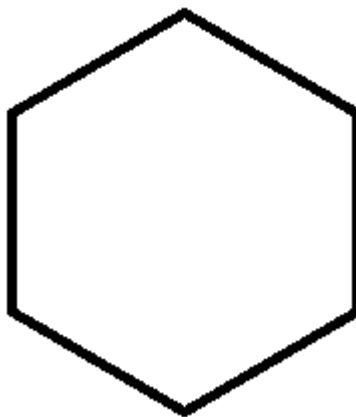
3. [5 points] Cut this object into **3** congruent pieces. Grid lines have been drawn for you.



4. [7 *points*] Cut this quadrilateral into 8 congruent pieces. Grid lines have been drawn for you.



5. [10 *points*] Cut this regular hexagon into 8 congruent pieces.



2 Separators

1. [6 points]

1		0	0	1	1
	2	0	0	1	1
1	1				
2	0				
0	2				
1	1				

2. [8 points]

1			0	0	1	0	4	3
	2		4	0	2	3	2	1
		3	2	0	3	1	0	2
0	2	0						
0	0	0						
2	0	0						
1	3	0						
3	0	1						
2	1	1						

3. [12 points]

1			3	0	3	0	3	3
	2		1	3	0	0	3	1
		3	2	3	3	0	0	0
3	3	0						
2	3	1						
1	2	3						
1	1	0						
3	1	2						
2	0	0						

4. [16 points] **Special rule:** The numbers to the left and top of the grid indicate the sum of the numbers between pairs of digits.

1			8		10		
	2		8				0
		3			5		6
		1					
	5						
		0					
10							
		4					
	0						

5. [18 points] As a reminder, special rules only apply for one problem

1						
	2		1		0	2
		3	2			
1						
		0				
0		1				
	4					
3	1					

3 Arrows

1. [5 points]

		2
1	2	

2. [11 points]

		1			
1				1	
			2	1	1

3. [13 points] **Special rule: Question marks have at least one arrow pointing to them. Arrows must point to at least one number/question mark.**

	2	?	?	
		1	2	?
	2	?	?	

4. [13 points] **Special rule: All arrows point in different directions.**

		1	3
2	0		
		1	0
1	2		

5. [18 points] As a reminder, special rules only apply for one problem

	5	3	6	
	3	4	3	
	7	2	4	