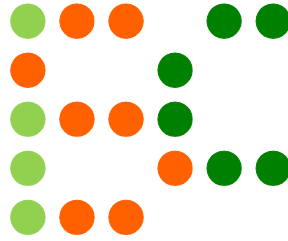


इयतरेक्य ललहलतलरलत



Episode – 4
8th – 12th March 2019

Math Variations
By
Pranav Kamesh and Rakesh Rai

Sudoku Mahabharat rounds will also serve as qualifiers for Indian Sudoku Championship for year 2019. Please check <http://logicmastersindia.com/SM/2019sm.asp> for details.

Important Links

Submission Page : <http://logicmastersindia.com/SM/201903>

Discussion Thread : <http://logicmastersindia.com/t/?tid=2692>

F. A. Q. : <http://logicmastersindia.com/t/?tid=381>

Registration, if required : <http://logicmastersindia.com/register.asp>

About this Episode

This episode has the following Sudokus

- Mini Classic Sudoku (4)
- Classic Sudoku (4)
- Little Killer Sudoku (2)
- X Sums Sudoku (2)
- Product Frame Sudoku (2)
- Difference N Sudoku (2)
- Remainder Sudoku (2)

How to participate?

- Understand the rules of different Sudokus that will appear in this episode. This Instruction Booklet has rules and examples for each Sudoku.
- Download the password protected Sudoku booklet (will be uploaded before the test starts). The Sudoku booklet contains the actual Sudokus to be solved. It is password protected, so you won't be able to open it.
- Any time on or after 8th March (but on or before 12th March), login at the submission page using your LMI userid and password.
- Please check the submission page for exact timing.
- Click on "Start". At this time, password for pdf will be shown and timer will start.
- You can either solve online using flash interface or print the pdf and solve on paper.
- Each Sudoku will be marked with two arrows
- If solving on paper
 - Fill the answer form with digits along the marked arrow(s)
 - Click submit button
- If solving online
 - After solving the Sudoku, click on "Submit" button below the grid
 - Each Sudoku grid has different submit buttons

If you are participating at LMI for first time, you must check the F.A.Q. at:
<http://logicmastersindia.com/t/?tid=381>.

Points Table and Scoring

Points typically indicate difficulty of the Sudokus and time required to solve them. While the organizers have made best efforts to match them, your personal experience and preference may differ.

This test uses instant grading where a solver can submit any individual Sudoku and receive confirmation that the solution is correct or not. Each incorrect submission reduces the sudoku's

potential score. The first, second, third, and fourth incorrect submissions reduce the potential score to 90%, 70%, 40%, and 0% respectively.

Mini Classic 1-6	1, 1, 1, 1
Classic 1-9	4, 4, 4, 6
Little Killer 1-6, 1-9	5, 13
X Sums 1-6, 1-9	2, 8
Product Frame 1-6, 1-9	2, 10
Difference N 1-6, 1-9	3, 15
Remainder 1-6, 1-9	4, 16

Bonus

If you submitted all Sudokus correctly, you can have bonus points 1 point per minute saved, computed up to seconds.

General Rules

To make the rules less repetitive, you will see following line “Apply standard Sudoku rules” in most Sudoku rules. This means “Place a digit from 1 to N, where N is the size of the grid, in each empty cell so that each digit appears exactly once in each row, column and outlined region.” These outlined regions could be 3X3 boxes, or other shapes.

Each Sudoku will be marked with, at max, 2 lettered arrows. If you are solving on paper, you need to submit the digits in these arrows, in order, including the givens. For example, the answer key for the Sudoku at the right is 162897453, 517698432.

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

About the Sudoku Booklet

The password protected Sudoku booklet will have 8 pages. If you are planning to solve on paper, we advise you to have a printer accessible with enough paper.

The Sudoku booklet will look similar to the next pages in this instruction booklet. The font sizes, cell sizes, colors, borders, shading, margin will be similar. We recommend you to print few pages of this instruction booklet. You can avoid any last minute surprise during the test.

1-4 Mini Classic Sudoku

1+1+1+1 points

Place a digit from 1 to 6 in each empty cell so that each digit appears exactly once in each row, column and 2X3 box.

1	2				
		3	4		
				5	6
3	5				
		1	5		
				1	3

5-8 Classic Sudoku

4+4+4+6 points

Classic Sudoku

Place a digit from 1 to 9 in each empty cell so that each digit appears exactly once in each row, column and 3X3 box.

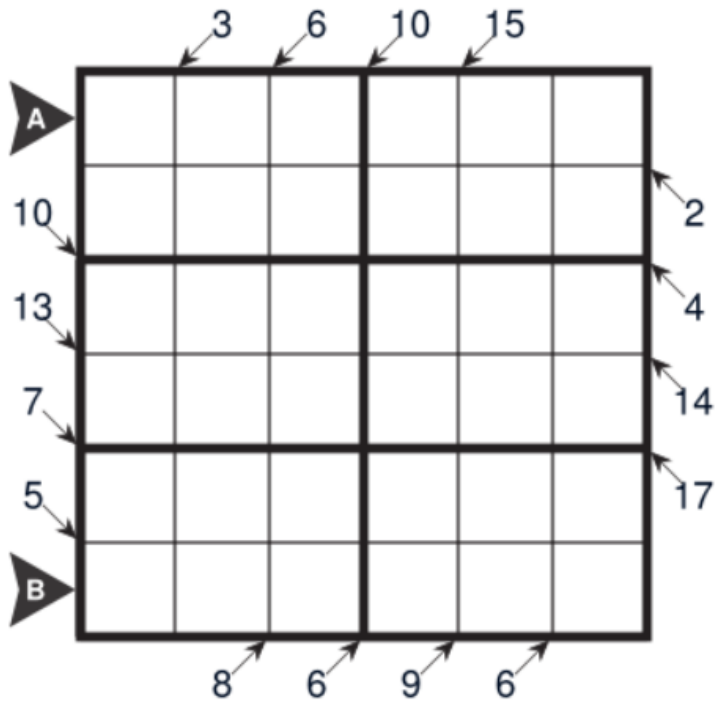
	1						8	
8		7				4		2
	9		4		2		3	
		9		3		7		
			5		4			
		6		9		5		
	7		1		6		5	
1		4				6		3
	6						7	

Little Killer Sudoku - 1

5 points

Apply mini classic Sudoku rules.

Additionally, numbers with arrows outside the grid indicate the sum of the digits appearing in the cells in the corresponding direction.

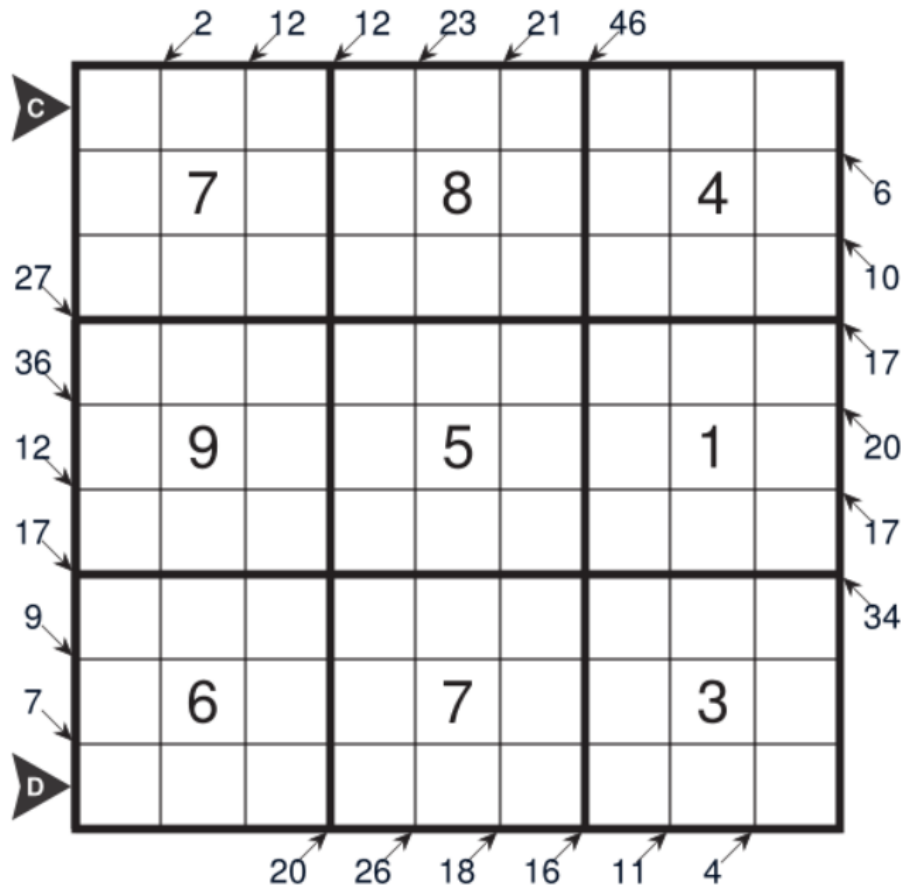


Little Killer Sudoku - 2

13 points

Apply classic Sudoku rules.

Additionally, numbers with arrows outside the grid indicate the sum of the digits appearing in the cells in the corresponding direction.

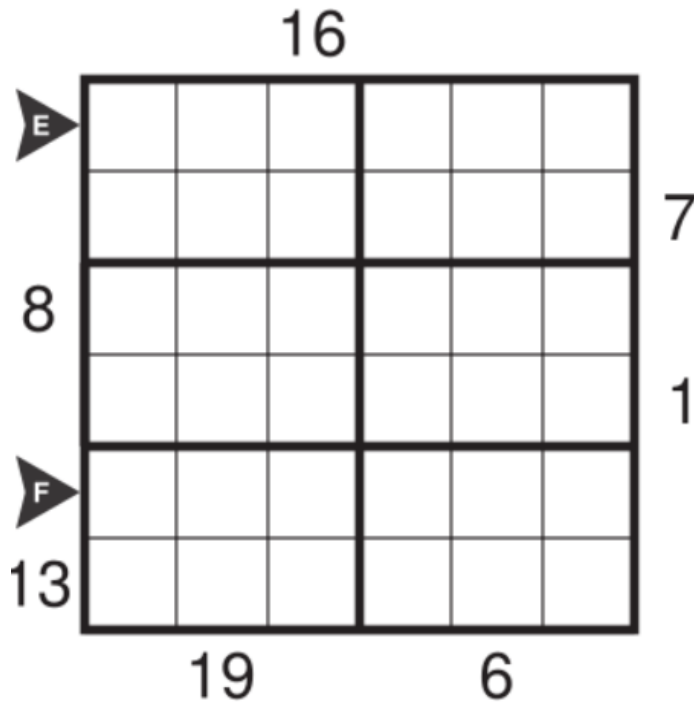


X Sums Sudoku - 1

2 points

Apply mini classic Sudoku rules.

Additionally the clues outside the grid indicate the sum of the first X numbers placed in the corresponding direction, where X is equal to the first number placed in that direction.

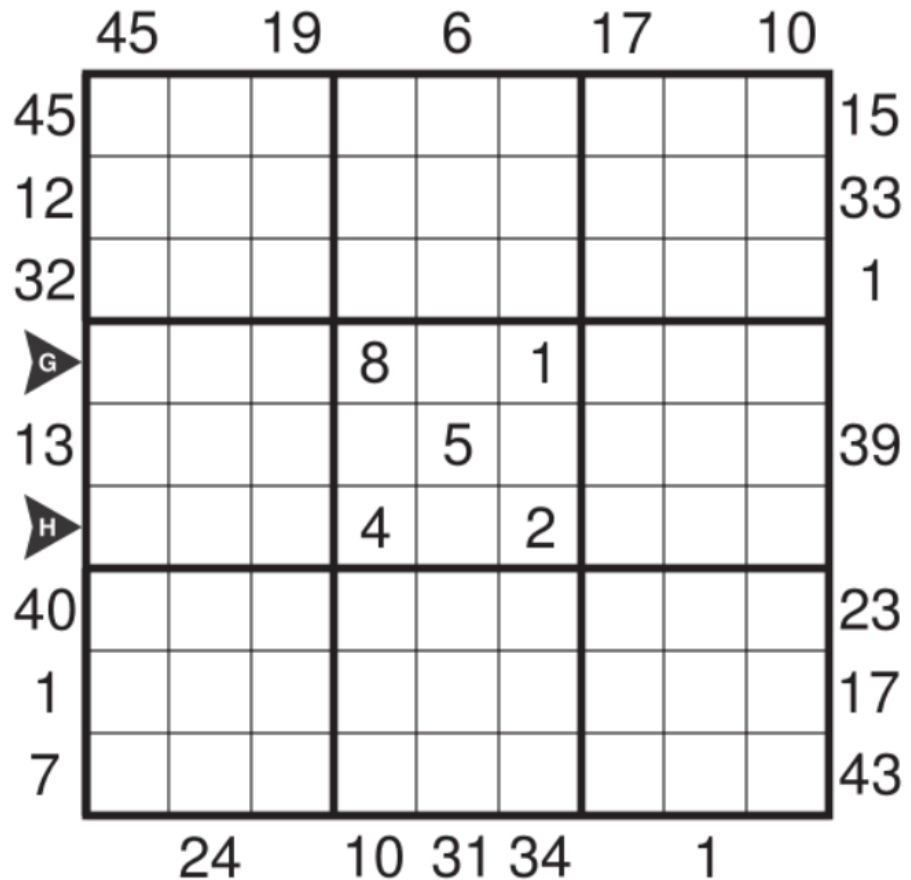


X Sums Sudoku - 2

8 points

Apply classic Sudoku rules.

Additionally the clues outside the grid indicate the sum of the first X numbers placed in the corresponding direction, where X is equal to the first number placed in that direction.



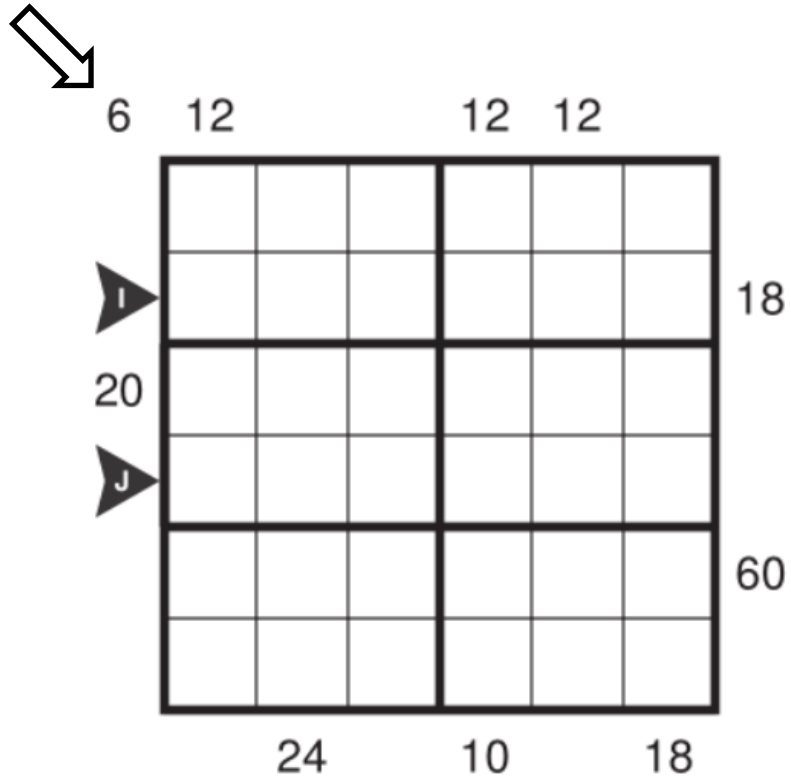
Product Frame Sudoku - 1

2 points

Apply mini classic Sudoku rules.

Additionally numbers outside the grid equal the product of the digits appearing in the cells in the first box (till the next bold line) seen from that direction (vertical, horizontal or diagonal).

Diagonal clues are indicated by block arrows.



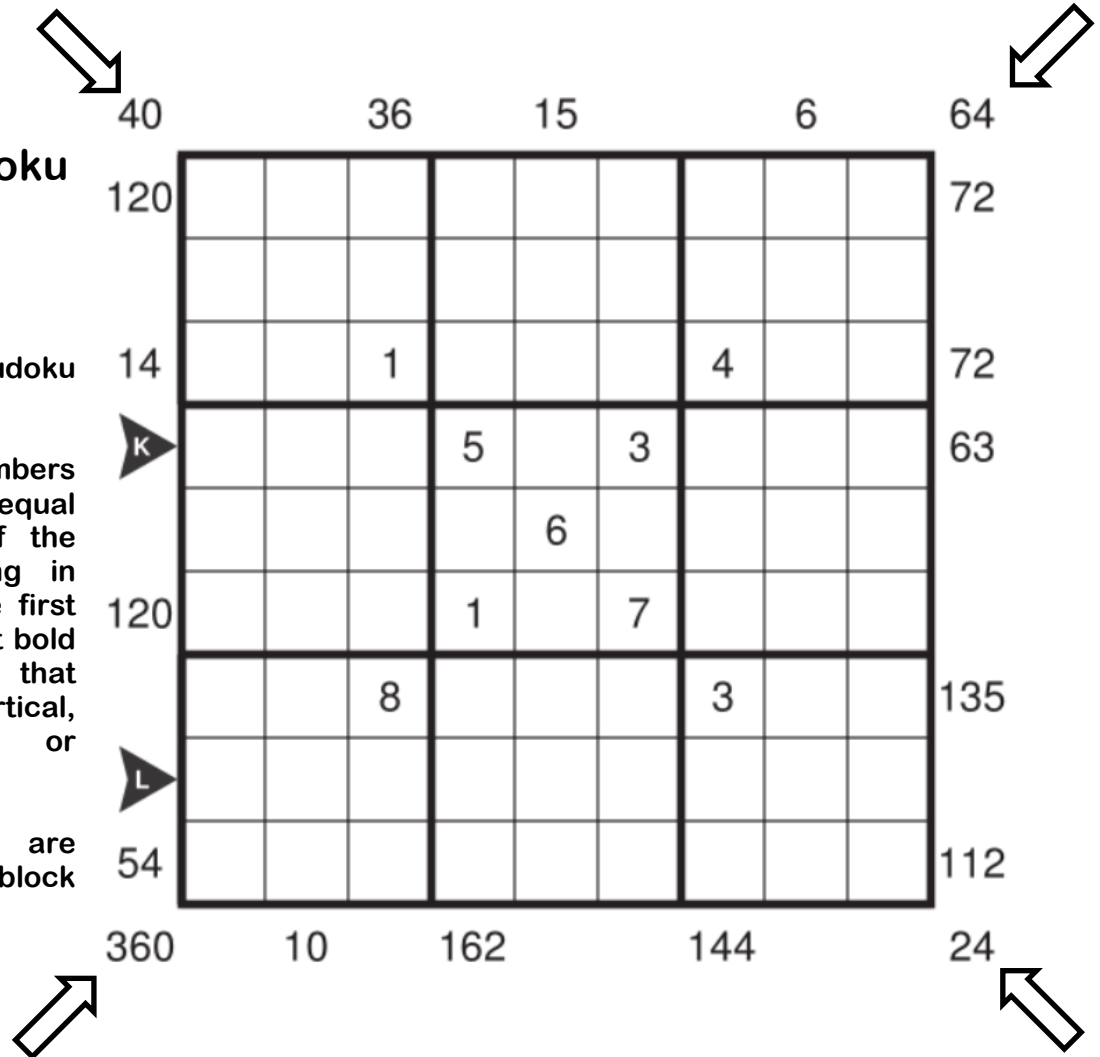
Product Frame Sudoku - 2

10 points

Apply classic Sudoku rules.

Additionally numbers outside the grid equal the product of the digits appearing in the cells in the first box (till the next bold line) seen from that direction (vertical, horizontal or diagonal).

Diagonal clues are indicated by block arrows.



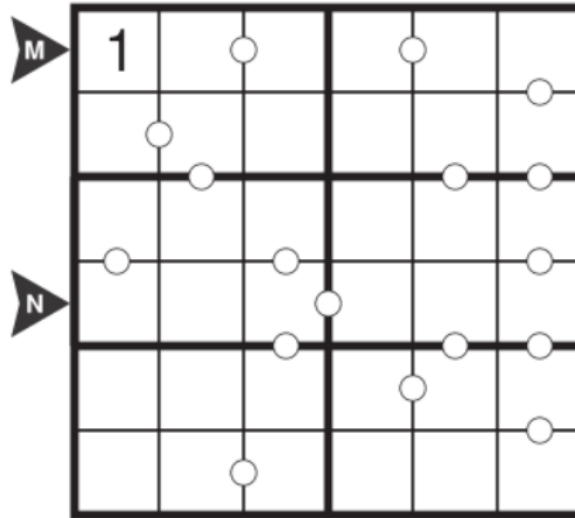
Difference N Sudoku - 1

3 points

Apply mini classic Sudoku rules.

Additionally, a white circle between two cells denotes that the difference of two cells is N. All possible circles are given.

N is a number between 1 and 5, and is to be determined as part of solving.



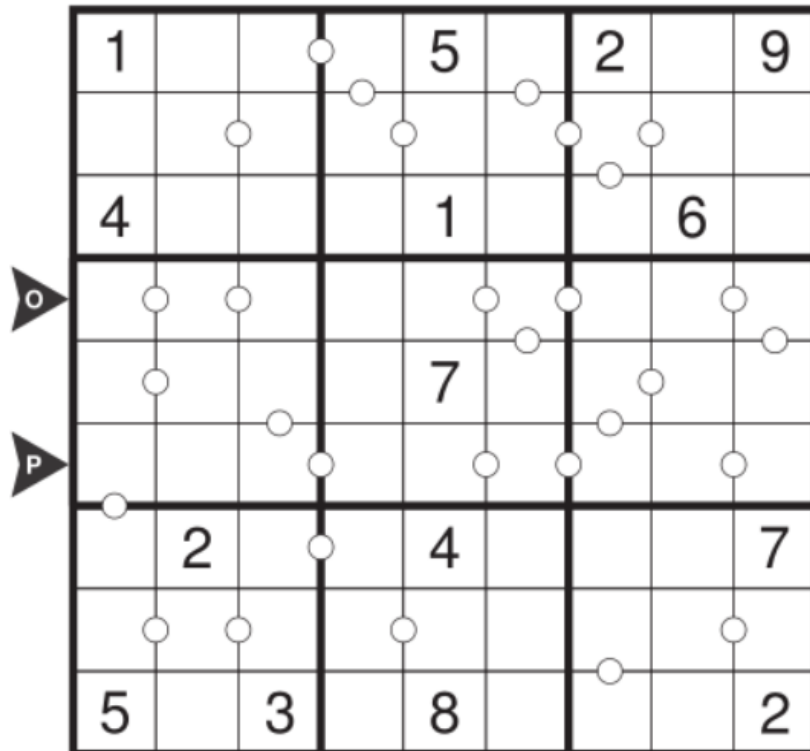
Difference N Sudoku - 2

15 points

Apply classic Sudoku rules.

Additionally, a white circle between two cells denotes that the difference of two cells is N. All possible circles are given.

N is a number between 1 and 8, and is to be determined as part of solving.

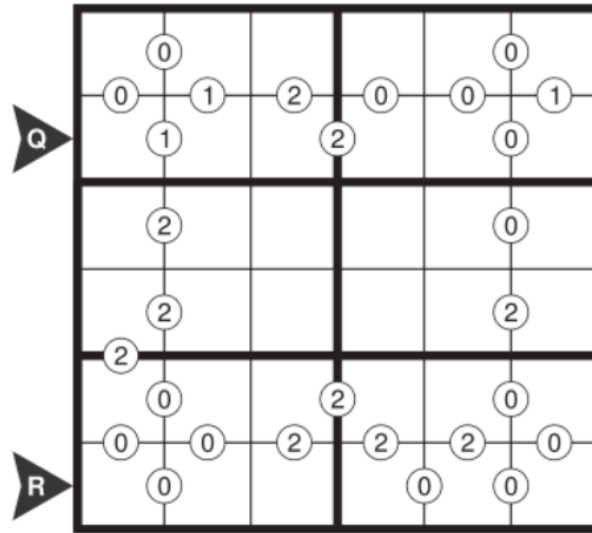


Remainder Sudoku - 1

4 points

Apply mini classic Sudoku rules.

Additionally, the circled numbers between two cells represent the remainder when the bigger number is divided by the smaller number. Not all remainders are given.

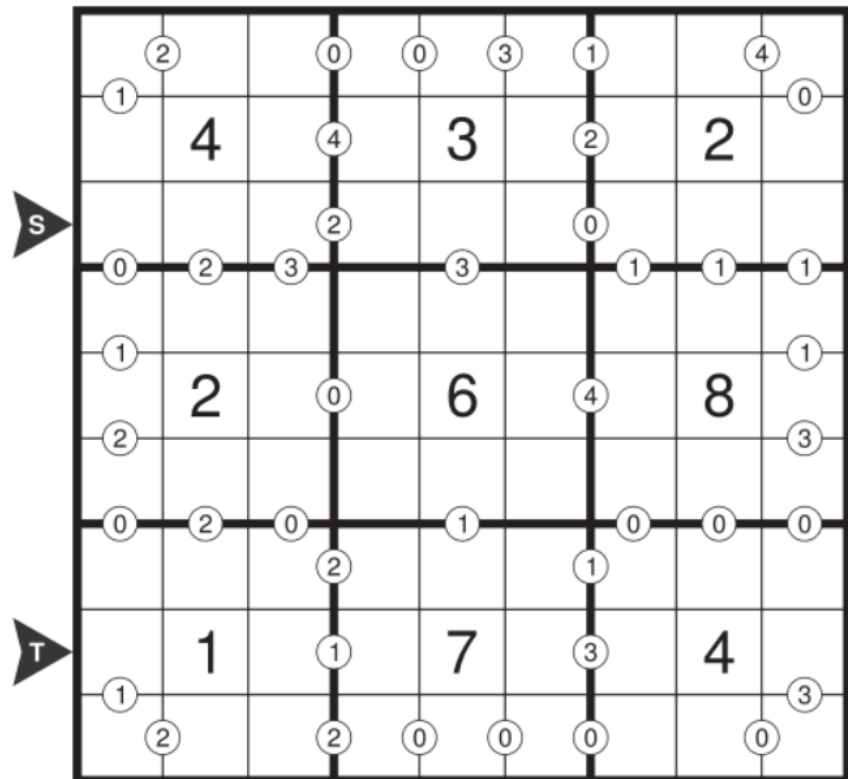


Remainder Sudoku - 2

16 points

Apply classic Sudoku rules.

Additionally, the circled numbers between two cells represent the remainder when the bigger number is divided by the smaller number. Not all remainders are given.



Mini Classic

				B		
	1	2	4	6	3	5
	5	6	3	4	2	1
A	4	1	2	3	5	6
	3	5	6	1	4	2
	2	3	1	5	6	4
	6	4	5	2	1	3

Classic

				D					
	4	1	2	6	7	3	9	8	5
	8	3	7	9	1	5	4	6	2
	6	9	5	4	8	2	1	3	7
	2	5	9	8	3	1	7	4	6
C	7	8	1	5	6	4	3	2	9
	3	4	6	2	9	7	5	1	8
	9	7	3	1	2	6	8	5	4
	1	2	4	7	5	8	6	9	3
	5	6	8	3	4	9	2	7	1

Little Killer - 1

		3	6	10	15				
A	3	5	6	4	1	2			
10	1	2	4	5	6	3	2		
13	2	1	3	6	5	4	4		
7	6	4	5	3	2	1	14		
5	4	6	2	1	3	5	17		
B	5	3	1	2	4	6			
		8	6	9	6				

X Sums - 1

E	5	2	4	6	1	3			
	1	3	6	4	5	2	7		
8	2	6	1	5	3	4			
	3	4	5	2	6	1	1		
F	6	1	2	3	4	5			
13	4	5	3	1	2	6			
		19			6				

Little Killer - 2

		2	12	12	23	21	46		
C	2	3	4	5	1	7	8	9	6
	9	7	5	2	8	6	3	4	1
27	1	8	6	9	4	3	2	7	5
36	5	4	7	1	2	8	9	6	3
12	8	9	3	6	5	4	7	1	2
17	6	2	1	7	3	9	4	5	8
9	3	1	9	4	6	2	5	8	7
7	4	6	2	8	7	5	1	3	9
D	7	5	8	3	9	1	6	2	4
		20	26	18	16	11	4		

X Sums - 2

45	9	7	5	1	2	6	4	8	3	15
12	3	1	8	7	4	5	2	9	6	33
32	6	4	2	9	8	3	5	7	1	1
G	5	9	3	8	7	1	6	4	2	
13	4	2	1	6	5	9	8	3	7	39
H	7	8	6	4	3	2	1	5	9	
40	8	3	9	2	1	4	7	6	5	23
1	1	6	7	5	9	8	3	2	4	17
7	2	5	4	3	6	7	9	1	8	43
		24		10	31	34			1	

Product Frame - 1

6	12		12	12		
	3	1	6	4	2	5
I	4	2	5	3	6	1
20	1	5	4	6	3	2
J	6	3	2	1	5	4
	2	6	1	5	4	3
	5	4	3	2	1	6
	24		10		18	

Difference N - 1

M	1	5	4	2	3	6
	3	2	6	4	1	5
N	5	3	1	6	2	4
	4	6	2	1	5	3
	6	1	3	5	4	2
	2	4	5	3	6	1

Product Frame - 2

40		36		15		6		64
120	5	6	4	7	3	2	9	1
	3	8	9	4	1	6	7	2
14	2	7	1	8	5	9	4	3
K	6	4	2	5	8	3	1	9
	1	9	7	2	6	4	5	8
120	8	3	5	1	9	7	2	6
	4	2	8	6	7	1	3	5
L	7	5	3	9	2	8	6	4
54	9	1	6	3	4	5	8	7
360		10		162		144		24

Difference N - 2

	1	7	6	3	5	4	2	8	9
	2	8	5	6	9	7	4	1	3
	4	3	9	2	1	8	7	6	5
O	8	5	2	1	3	6	9	7	4
	3	6	4	8	7	9	5	2	1
P	9	1	7	4	2	5	8	3	6
	6	2	8	5	4	3	1	9	7
	7	4	1	9	6	2	3	5	8
	5	9	3	7	8	1	6	4	2

Remainder - 1

	1	5	4	2	3	6
Q	3	2	6	4	1	5
	5	3	1	6	2	4
	4	6	2	1	5	3
R	6	1	3	5	4	2
	2	4	5	3	6	1

Remainder - 2

	3	2	8	2	0	1	0	4	3	7	1	6	9	4	5
	7	4	5	4	9	3	6	2	8	2	1				
S	1	9	6	2	8	5	2	0	4	7	3				
	5	7	9	4	8	1	3	6	2						
	4	2	1	0	3	6	5	4	9	8	7				
	6	3	8	7	2	9	1	5	4						
	2	5	4	2	6	9	3	1	7	1	8				
T	9	1	3	1	2	7	8	3	5	4	6				
	8	2	6	7	2	5	0	1	0	4	0	2	3	0	9