सुदोकु
mahabharat

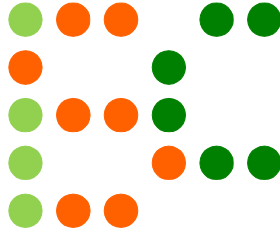## Episode – 5
27th – 30th April 2018
Math Variations
By Gaurav Kumar Jain

Sudoku Mahabharat rounds will also serve as qualifiers for Indian Sudoku Championship for year 2018. Please check http://logicmastersindia.com/SM/2018sm.asp for details.

About this Episode

Apart from Classic Sudokus of different sizes, this episode has the following five variants
- Killer Sudoku
- Diagonal Product Sudoku
- 246/258 Sum Sudoku
- Little Killer Sudoku
- Sudoku N

How to participate?

- Understand the rules of different Sudokus that will appear in this episode. This Instruction Booklet has rules 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 27th April (but on or before 30th April), 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.

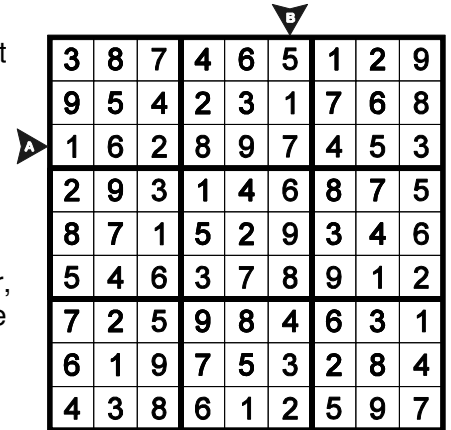| Standard 1-6	1, 1, 1, 1
Standard 1-8	3
Standard 1-9	4, 5, 6
Killer 1-6, 1-9	3, 11
Diagonal Product 1-6, 1-9	2, 10
246/258 Sum 1-6, 1-9	2, 13
Little Killer 1-6, 1-9	5, 15
Sudoku N 1-6, 1-9	4, 13

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

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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.

Standard Sudoku

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.

Standard Sudoku (1)

1 point

Standard Sudoku (2)

1 point

Standard Sudoku (3)

1 point

Standard Sudoku (4)

1 point

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Math

Standard Sudoku (5)

3 points

Place a digit from 1 to 8 in each empty cell so that each digit appears exactly once in each row, column and 2x4 box.

Standard Sudoku (6)

4 points

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.

Math

Standard Sudoku (7)

5 points

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.

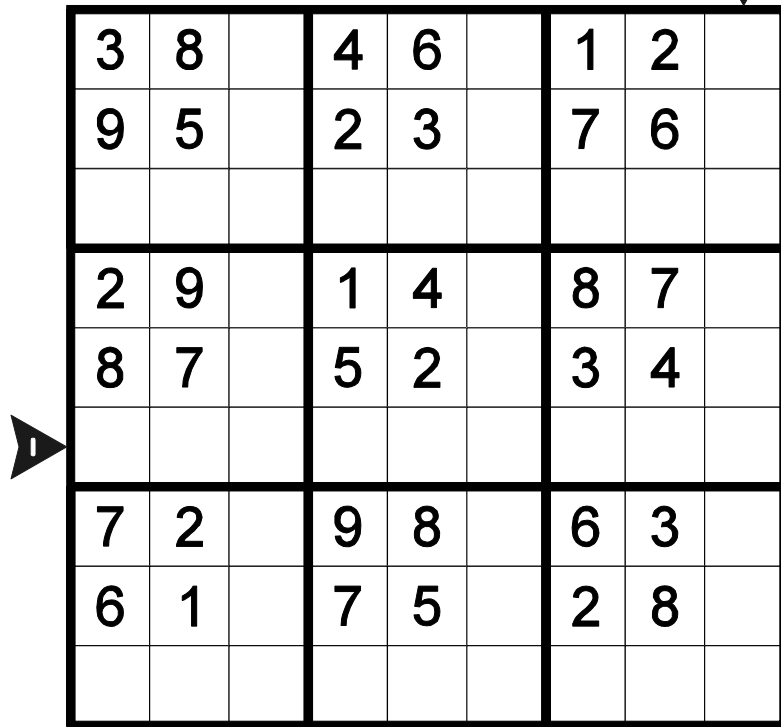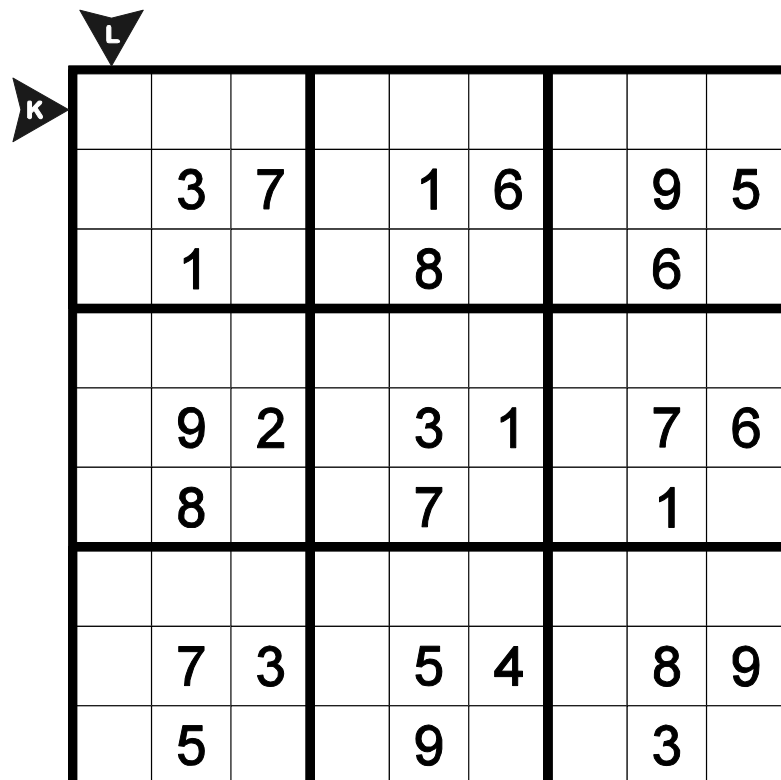| 3	8		4	6		1	2	
9	5		2	3		7	6	
2	9		1	4		8	7	
8	7		5	2		3	4	
7	2		9	8		6	3	
6	1		7	5		2	8	

Standard Sudoku (8)

6 points

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.

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

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Math

Killer Sudoku (1)

3 points

Apply standard Sudoku rules.

The sum of digits in cells inside every cage must equal the total given for the cage at the upper left cell. Digits do not repeat inside a cage.

Killer Sudoku (2)

11 points

Apply standard Sudoku rules.

The sum of digits in cells inside every cage must equal the total given for the cage at the upper left cell. Digits do not repeat inside a cage.

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Diagonal Product Sudoku (1)

2 points

Apply standard Sudoku rules.

Additionally, a number given on the border between two diagonally adjacent cells is the product of the digits in the two cells pointed by the number.

Diagonal Product Sudoku (2)

10 points

Apply standard Sudoku rules.

Additionally, a number given on the border between two diagonally adjacent cells is the product of the digits in the two cells pointed by the number.

246 Sum Sudoku

2 points

Apply standard Sudoku rules.

Numbers outside the grid equal the sum of the digits appearing in the 2nd, 4th and 6th cells seen from that edge of the grid.

	12	10	10	14	7	10
12	1					6
11						
10▶						
9 ▶						
7						
14	2					5

(I ▶ points to row 10, J ▶ points to row 9)

258 Sum Sudoku

13 points

Apply standard Sudoku rules.

Numbers outside the grid equal the sum of the digits appearing in the 2nd, 5th and 8th cells seen from that edge of the grid.

	12	14	9	22	24	19	8	11	16
18	2				4				3
18									
17			1				6		
14				4		2			
17 ▶	4				9				8
8				8		7			
15			9				8		
14									
14	6				2				7

(L ▼ points to column 8, K ▶ points to row 17)

Math

Little Killer Sudoku (1)

5 points

Apply standard Sudoku rules.

Numbers with arrows outside the grid indicate the sum of the numbers in the corresponding direction.
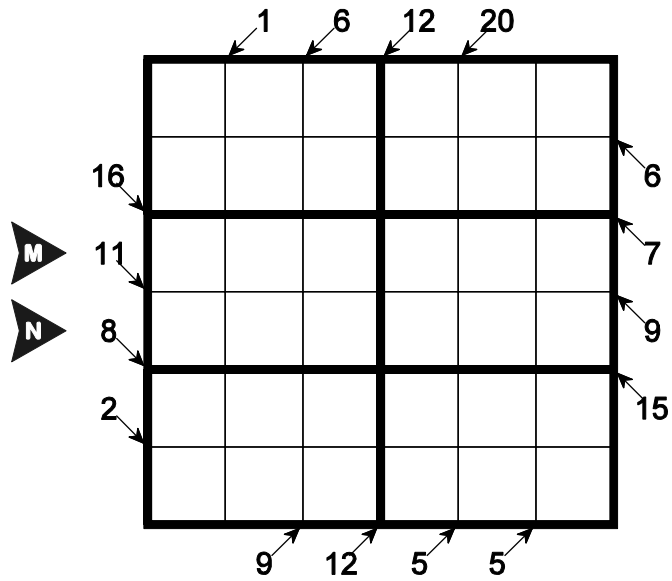
Little Killer Sudoku (2)

15 points

Apply standard Sudoku rules.

Numbers with arrows outside the grid indicate the sum of the numbers in the corresponding direction.

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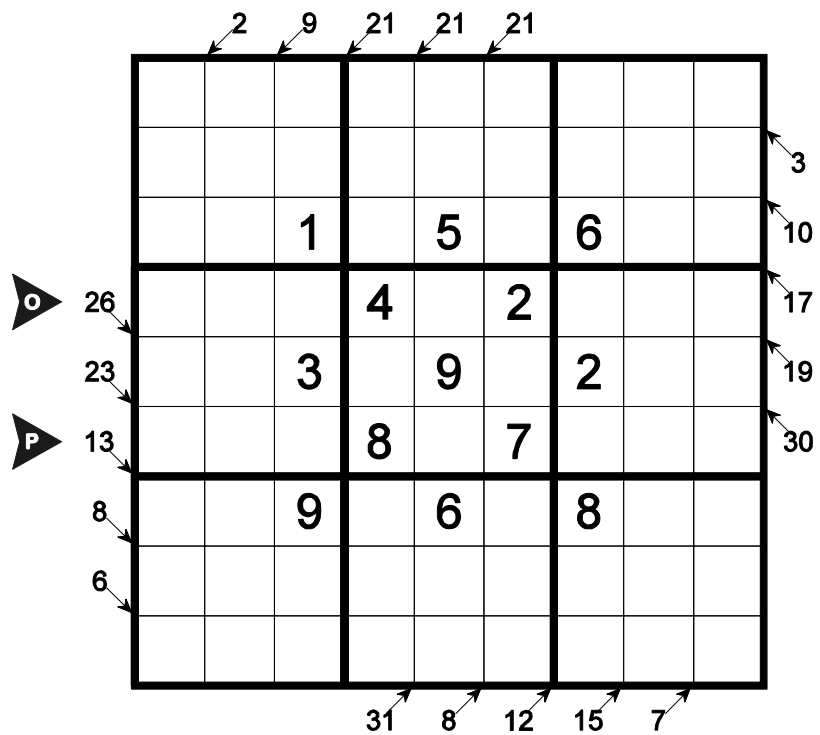
Math

Sudoku N (1)

4 points

Apply standard Sudoku rules.

Two cells are separated by a black dot if any mathematical operation (addition, multiplication, subtraction or division) performed between the two cells leads to a result of N. N is a number in the range 1-6 and is to be determined as part of solving.

All possible dots are marked.
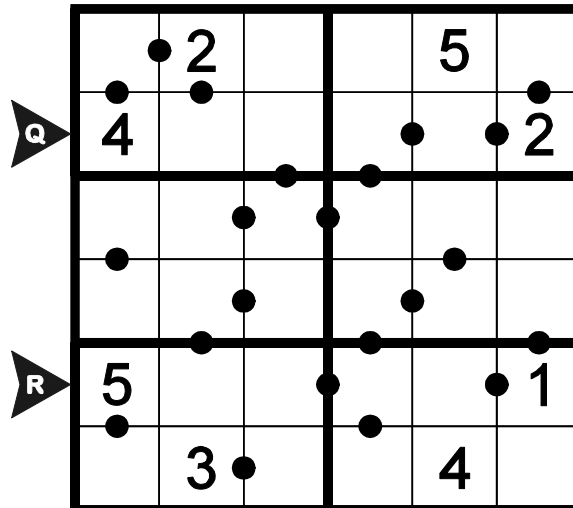
Sudoku N (2)

13 points

Apply standard Sudoku rules.

Two cells are separated by a black dot if any mathematical operation (addition, multiplication, subtraction or division) performed between the two cells leads to a result of N. N is a number in the range 1-9 and is to be determined as part of solving.

All possible dots are marked.

Sudoku mahabharat   **Math**

Solutions

Standard (1)

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

Standard (2)

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

Standard (3)

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

Standard (4)

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

Standard (5)

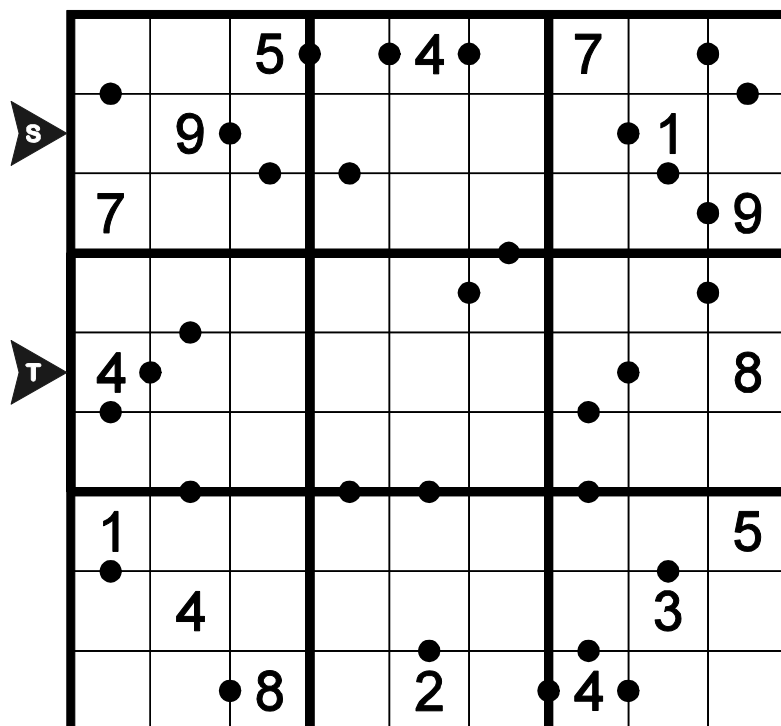| 8	5	6	4	1	2	7	3
7	1	2	3	8	5	6	4
1	4	5	6	2	8	3	7
3	7	8	2	5	6	4	1
6	3	4	5	7	1	2	8
2	8	1	7	3	4	5	6
4	2	3	1	6	7	8	5
5	6	7	8	4	3	1	2

Standard (6)

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
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

Standard (7)

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

Standard (8)

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

Killer (1)

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

Diagonal Product (1)

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

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Killer (2)

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

Diagonal Product (2)

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

246 Sudoku

	12	10	10	14	7	10
12	1	2	3	4	5	6
11	4	6	5	3	1	2
10	3	5	2	1	6	4
9	6	1	4	5	2	3
7	5	4	6	2	3	1
14	2	3	1	6	4	5

Little Killer (1)

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

258 Sudoku

	12	14	9	22	24	19	8	11	16
18	2	6	5	1	4	9	7	8	3
18	3	9	4	7	8	6	5	1	2
17	7	8	1	2	5	3	6	4	9
14	8	5	7	4	3	2	9	6	1
17	4	1	3	6	9	5	2	7	8
8	9	2	6	8	1	7	3	5	4
15	1	7	9	3	6	4	8	2	5
14	5	4	2	9	7	8	1	3	6
14	6	3	8	5	2	1	4	9	7

Little Killer (2)

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

Sudoku N (1)

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

(N=3)

Sudoku N (2)

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

(N=5)

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Math