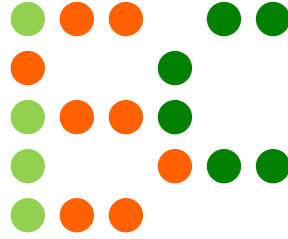


इयवठेकय mahabharat



Episode – 4
14th – 16th November

Math Variations
by
Rohan Rao

Sudoku Mahabharat rounds will also serve as qualifiers for Indian Sudoku Championship for year 2016. Please check <http://logicmastersindia.com/SM/2015-16.asp> for details.

Important Links

Submission Page : <http://logicmastersindia.com/SM/201511/>

Discussion Thread : <http://logicmastersindia.com/SM/201511/discuss.asp>

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

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

About this Episode

Apart from classic Sudokus of different sizes, this episode has five variants based on basic mathematical operations (addition, subtraction, multiplication, division), namely Killer Sudoku, Sum Frame Sudoku, Group Sum Sudoku, Equal Product Sudoku and Division Sudoku.

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 during the given weekend, 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 submission reduces the potential score to 90%, 70%, 40%, and 0% respectively.

Standard 6X6	1, 1, 1, 1
Standard 8X8	2
Standard 9X9	3, 6, 4
Killer Sudoku 6X6, 9X9	6, 7
Sum Frame Sudoku 6X6, 9X9	4, 10
Group Sum Sudoku 6X6, 9X9	7, 15
Equal Product 6X6, 9X9	5, 13
Division Sudoku 6X6, 9X9	3, 11

Bonus

If you submitted all Sudokus correctly, you can have bonus points 1 point per minute saved, computed upto 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 exactly like next 8 pages in this instruction booklet. The font sizes, cell sizes, colors, borders, shading, margin will be identical. 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.

1 point

A

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

1 point

B

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

1 point

C

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

1 point

D

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

Standard Sudoku

2 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.

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

Standard Sudoku

3 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.

	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

Standard Sudoku

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	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

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.

	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	

Killer Sudoku

6 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.

8	8			8	
	9			10	9
9	11	11			
		9			
		12			6
7		9			

Killer Sudoku

7 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.

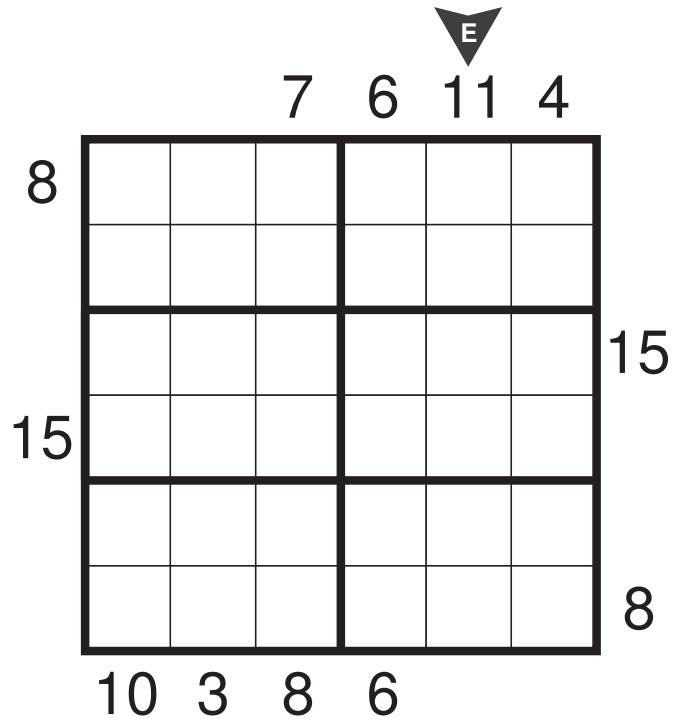
12	3	11	14	15		12	5	17
					17			
11		20				11		
13			5	24		10		15
	9				11	16		
	11		12			8		
14				32			13	
11	15	5			5	11	14	3

Sum Frame Sudoku

4 points

Apply standard Sudoku rules.

Numbers outside the grid equal the sum of the digits appearing in the first box (till the next bold line) seen from that edge of the grid.

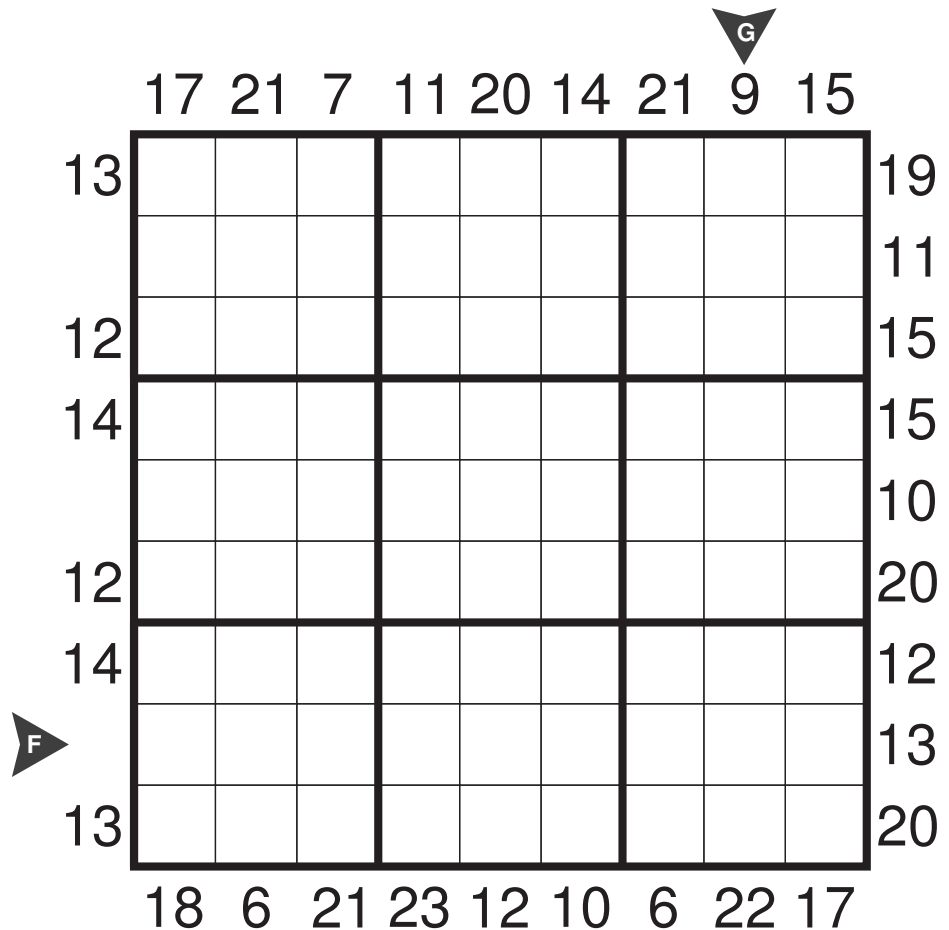


Sum Frame Sudoku

10 points

Apply standard Sudoku rules.

Numbers outside the grid equal the sum of the digits appearing in the first box (till the next bold line) seen from that edge of the grid.

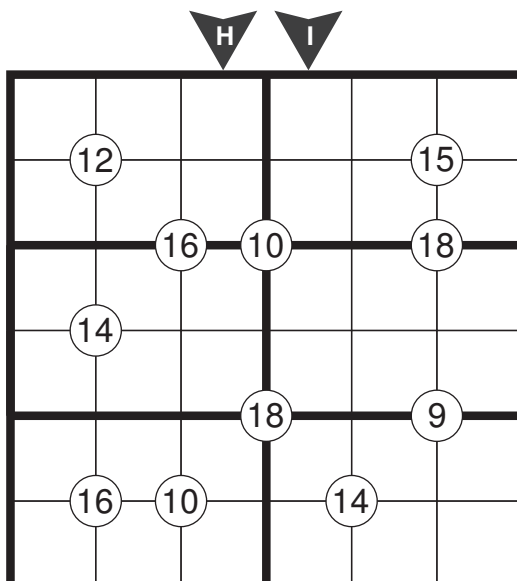


Group Sum Sudoku

7 points

Apply standard Sudoku rules.

The numbers inside the circles represent the sum of digits in the neighbouring four cells.

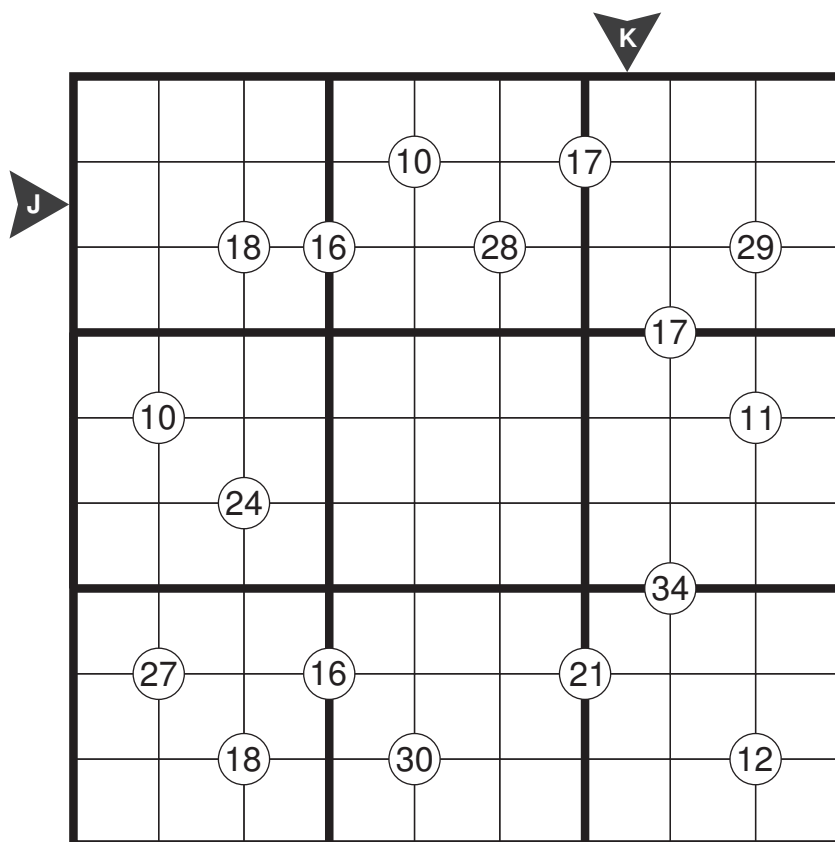


Group Sum Sudoku

15 points

Apply standard Sudoku rules.

The numbers inside the circles represent the sum of digits in the neighbouring four cells.

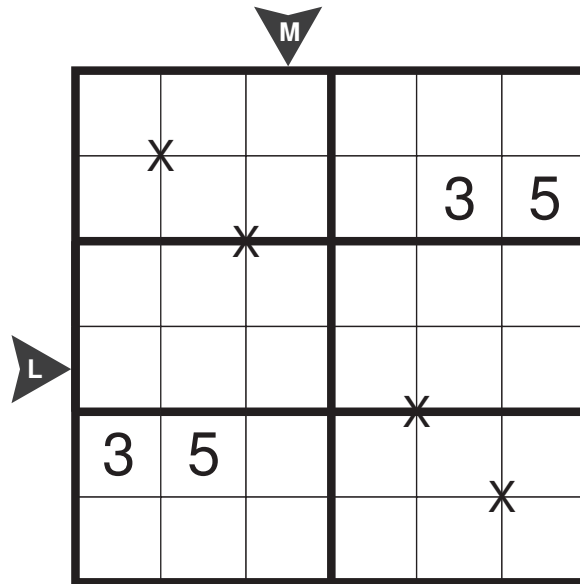


Equal Product Sudoku

5 points

Apply standard Sudoku rules.

Intersections marked with 'X' indicate the product of digits in diagonally opposite cells is equal. Not all possible 'X's are marked.

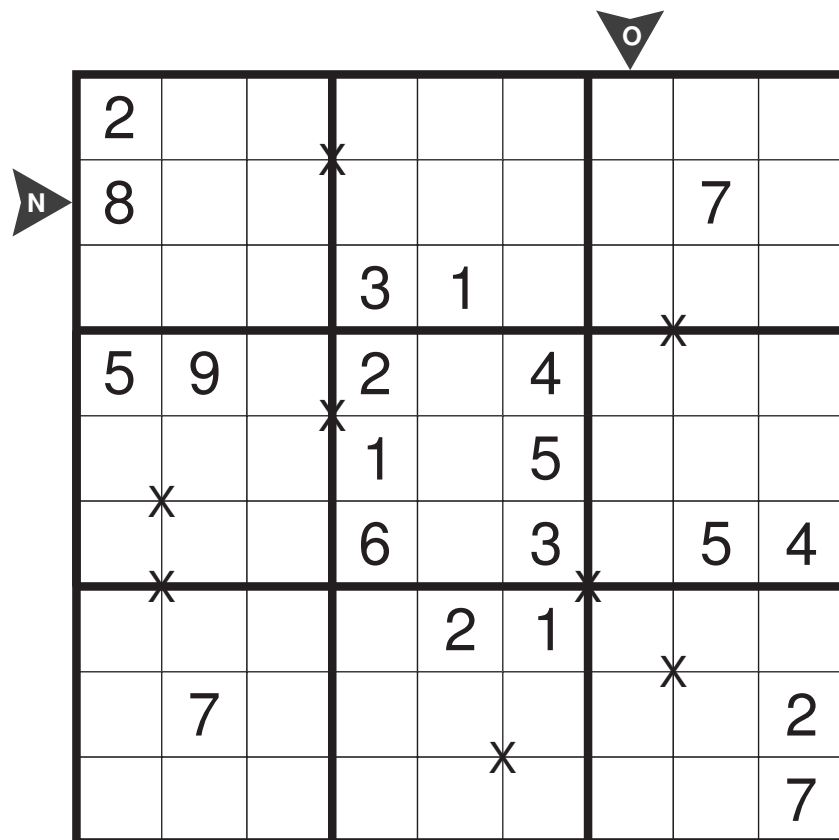


Equal Product Sudoku

13 points

Apply standard Sudoku rules.

Intersections marked with 'X' indicate the product of digits in diagonally opposite cells is equal. Not all possible 'X's are marked.



Division Sudoku

3 points

Apply standard Sudoku rules.

The number between two cells indicates the quotient/result when the larger digit is divided by the smaller digit. The remainder must be zero.

P

	5				
2		6			
	3		2		
		4		5	
			5		4
				6	

Division Sudoku

11 points

Apply standard Sudoku rules.

The number between two cells indicates the quotient/result when the larger digit is divided by the smaller digit. The remainder must be zero.

R

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

Q

Killer

	8		8		8	
	5	1	4	3	2	6
	3	6	2	1	5	4
	9	11	11	10	9	
9	2	4	6	5	1	3
A	1	5	3	6	4	2
	6	2	5	4	3	1
	7	9	12	6		
	4	3	1	2	6	5

Sum Frame

	7		6		11		4	
8	2	5	1	4	6	3		
	3	4	6	2	5	1		
	1	3	2	6	4	5	15	
15	5	6	4	3	1	2		
	4	1	3	5	2	6		
	6	2	5	1	3	4	8	
	10	3	8	6				

Killer

	12		3		11		14		15		12		5		17	
	9	2	5	6	3	4	7	1	8							
	3	1	6	8	2	7	5	4	9							
	11	7	4	20	8	5	1	9	6	2	3					
	13	4	5	7	5	3	24	1	10	2	8	15	6			
C	1	9	6	3	2	8	5	9	7	4						
	8	19	2	12	4	7	6	8	1	3	5					
	14	2	3	9	1	5	8	4	6	7						
	15	8	5	4	7	6	2	13	9	1						
	6	7	1	9	4	3	8	5	2							

Sum Frame

	17		21		7		11		20		14		21		9		15	
13	5	6	2	4	8	1	9	3	7	19								
	9	7	4	5	3	6	8	1	2	11								
12	3	8	1	2	9	7	4	5	6	15								
14	2	9	3	7	5	4	6	8	1	15								
	7	4	8	1	6	9	5	2	3	10								
12	1	5	6	3	2	8	7	4	9	20								
14	8	1	5	9	7	3	2	6	4	12								
F	6	3	9	8	4	2	1	7	5	13								
13	4	2	7	6	1	5	3	9	8	20								
	18	6	21	23	12	10	6	22	17									

Group Sum

	H		I			
	4	1	6	5	2	3
	12	2	5	3	1	6
	16	10	18			
	14	1	6	2	4	3
	3	4	5	6	1	2
	18	9				
	6	2	4	3	5	1
	16	10	14			
	5	3	1	2	4	6

Equal Product

	M				
	6	3	5	1	4
	*	4	2	1	6
	*	1	4	2	3
	*	1	4	2	3
L	5	6	3	2	1
	*	3	5	6	4
	*	2	1	4	2
	*	2	1	4	5

Group Sum

K

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

J

Equal Product

O

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

N

Division

P

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

Division

R

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

Q