Episode – 4
17th – 23rd May 2024

Outside & Converse
by
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Sudoku Mahabharat rounds will also serve as qualifiers for Indian Sudoku Championship for year 2024. Please check http://logicmastersindia.com/SM/2024sm.asp **for details.**

<u>Important Links</u>

Submission Page : http://logicmastersindia.com/live?contest=SM202404

Discussion Thread : http://logicmastersindia.com/t/?tid=3781

F. A. Q. : http://logicmastersindia.com/t/?tid=2773

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

About this Episode

This episode has 18 Sudokus with the following breakdown:

- 2* Classic Sudoku 6x6 and 4* Classic Sudoku 9x9
- 1 each of Skyscrapers Sudoku 6x6 and Skyscrapers Sudoku 9x9
- 1 each of Little Killer Sudoku 6x6 and Little Killer Sudoku 9x9
- 1 each of Position Sums Sudoku 6x6 and Position Sums Sudoku 9x9
- 1 each of No Touch Sudoku 6x6 and No Touch Sudoku 9x9
- 1 each of Kropki Sudoku 6x6 and Kropki Sudoku 9x9
- 1 each of XY Differences Sudoku 6x6 and XY Differences Sudoku 9x9

How to participate?

- Understand the rules of different variants that will appear in this episode. This Instruction Booklet has rules for each of them.
- Any time on or after 17th May (but on or before 23rd May), login at the submission page using your LMI user-id and password. Please check the submission page for exact timing.
- **If you plan to solve on paper:**
  a) Download the password protected Puzzle booklet (will be uploaded before the test starts). The Puzzle booklet contains the actual Puzzles to be solved. It is password protected, so you won't be able to open it.
  b) Click on "Start". At this time, password for pdf will be shown and timer will start. **The contest duration is 90 minutes.**
  c) The puzzle booklet can be downloaded, printed and solved on paper.
  d) We advise you to have a printer accessible with enough paper.
  e) You are allowed to use writing implements, eraser, blank paper (including commercial graph paper), ruler, scissors, and tape.
- **If you plan to solve on LMI's Penpa-Integrated Interface:**
  a) Click on this link and understand the instructions - https://logicmastersindia.com/live/faq-online-solving.asp
  b) It is noted on the link too, but we note it here as well to be clear – the participants must still input the answer keys in the boxes below the puzzle and submit them to receive credit as given below.
- Irregular solving help of any kind is not permitted. This includes but is not limited to: assistance of any kind from any other person; prepared notes, books, calculators, computers, or tools other than items explicitly permitted.
- Participants may use both paper solving and online solving, even interchangeably. Eventually our system will only count anything submitted in the submission boxes in either mode.

If you are participating at LMI for first time, it will be useful to check the F.A.Q. at http://logicmastersindia.com/t/?tid=2773.

About answer keys and Submission

- After solving the puzzle, you need to submit the puzzle using the answer keys.
- You may submit the answer keys anytime during the test duration.
- Answer keys are always to be entered from left to right or top to bottom
- Don't enter any separator unless specified in the answer key
- If one row and one column is marked, enter the row first and then the column
- If multiple rows are marked, enter from top to bottom for marked rows
- If multiple columns are marked, enter from left to right for marked columns

Points Table and Scoring

Points typically indicate difficulty of the Puzzles and time required to solve them. You will get full points if you enter the correct answer key. While the organizers have made best efforts to match them, **your personal experience and preference may differ.**

Classic Sudoku 6x6	1, 1
Classic Sudoku 9x9	8, 8, 5, 4
Skyscrapers Sudoku 6x6 & 9x9	3, 11
Little Killer Sudoku 6x6 & 9x9	3, 9
Position Sums Sudoku 6x6 & 9x9	3, 9
No Touch Sudoku 6x6 & 9x9	1, 7
Kropki Sudoku 6x6 & 9x9	2, 8
XY Differences Sudoku 6x6 & 9x9	4, 13

This test uses instant grading where a solver can submit any individual Puzzle and receive confirmation that the solution is correct or not. Each incorrect submission reduces the puzzle's potential score. The first, second, third, and fourth incorrect submissions reduce the potential score to 90%, 70%, 40%, and 0% respectively. A demonstration for this is shown below.

Original points

| 04 Araf | 50 points | 4A | Sum should be 10 |

Potential points after 1 incorrect submission

| 04 Araf | 45 / 50 | 4A | 1234 |

Potential points after 2 incorrect submissions

| 04 Araf | 35 / 50 | 4A | 23311 |

Potential points after 3 incorrect submissions

| 04 Araf | 20 / 50 | 4A | 1111111111 |

Potential points after 4 incorrect submissions

| 04 Araf | 0 / 50 | 4A | 541 |

Bonus and Ranking

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

Ranking will be based on following rules in order:
1. Most total points
2. Earliest final submission time, up to seconds (ignoring incorrect submissions)

Credits
- **Wessel Strijkstra and Botaku** for test solving the puzzles and providing invaluable feedback.
- The original creator **opt-pan** for penpa edit - https://opt-pan.github.io/penpa-edit/
- **Swaroop Guggilam** for his recent efforts in adding features to Penpa-edit - https://swaroopg92.github.io/penpa-edit/ and also working to integrate it with our contest engine.

About the Puzzle Booklet
The password protected Puzzle booklet will have 10 pages. This is relevant only for paper solvers.

Solutions to examples are towards the end of the booklet in the Solutions section.

Rules Powered by Sudokuib - https://github.com/vopani/sudokuib

All answer keys are the same for all puzzles – enter the contents of the marked rows/columns, including given digits, along the direction of the arrow. Ignore outside clues.

1-2 Classic Sudoku 6x6

1 + 1 points

Place a digit from 1 to 6 into each empty cell in the grid so that each digit appears exactly once in each row, column and 2x3 outlined box.

Penpa for example:
https://tinyurl.com/2nvezsrr

3-6 Classic Sudoku 9x9

8 + 8 + 5 + 4 points

Place a digit from 1 to 9 into each empty cell in the grid so that each digit appears exactly once in each row, column and 3x3 outlined box.

Penpa for example:
https://tinyurl.com/333ntt48

Sudoku Mahabharat

Outside & Converse 2024

7 Skyscrapers Sudoku 6x6

3 points

Place a digit from 1 to 6 into each empty cell in the grid so that each digit appears exactly once in each row, column and 2x3 outlined box.

Each digit inside the grid represents the height of a skyscraper in that cell. Each number outside the grid represents the number of skyscrapers that can be seen in the corresponding row or column. Taller skyscrapers hide shorter ones.

Penpa for example:
https://tinyurl.com/y4ljb5tl

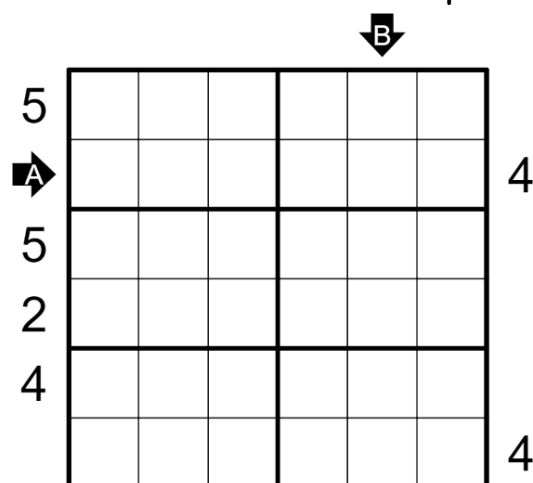# 8 Skyscrapers Sudoku 9x9

11 points

Place a digit from 1 to 9 into each empty cell in the grid so that each digit appears exactly once in each row, column and 3x3 outlined box.

Each digit inside the grid represents the height of a skyscraper in that cell. Each number outside the grid represents the number of skyscrapers that can be seen in the corresponding row or column. Taller skyscrapers hide shorter ones.

Penpa for example:
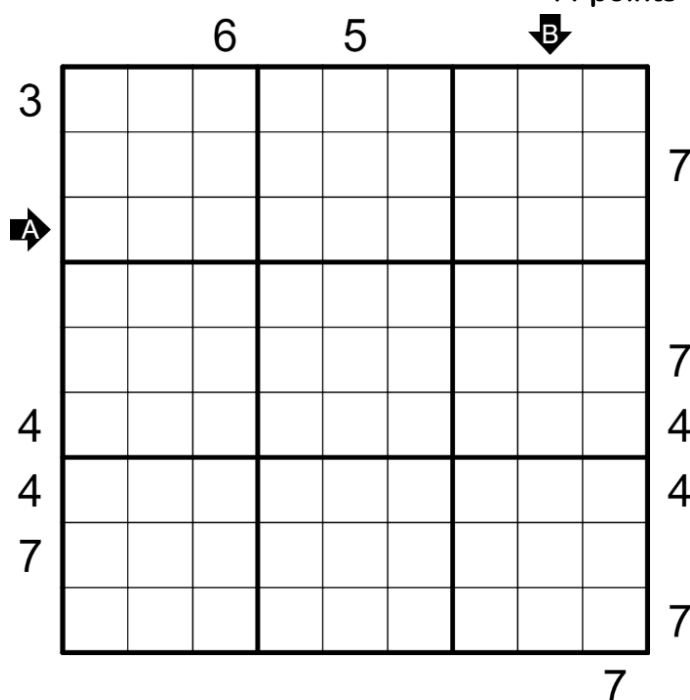https://tinyurl.com/yxfcy972

9 Little Killer Sudoku 6x6

3 points

Place a digit from 1 to 6 into each empty cell in the grid so that each digit appears exactly once in each row, column and 2x3 outlined box.

Each number outside the grid is the sum of digits in the direction pointed by its arrow. Digits can repeat along a sum.

Penpa for example:
https://tinyurl.com/2nb7kz4f

10 Little Killer Sudoku 9x9

9 points

Place a digit from 1 to 9 into each empty cell in the grid so that each digit appears exactly once in each row, column and 3x3 outlined box.

Each number outside the grid is the sum of digits in the direction pointed by its arrow. Digits can repeat along a sum.

Penpa for example:
https://tinyurl.com/2he9vyz8
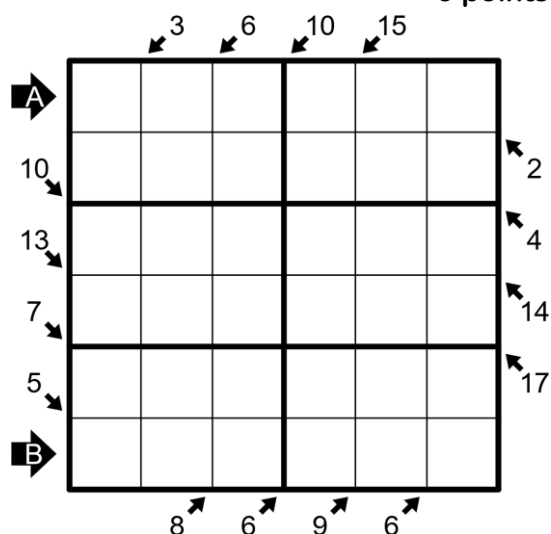
11 Position Sums Sudoku 6x6

3 points

Place a digit from 1 to 6 into each empty cell in the grid so that each digit appears exactly once in each row, column and 2x3 outlined box.

Digits in the first and second cell from the top and from the left are A and B for that column/row. There are two sets of clues outside the grid:
The ones closest to the grid give the sum of A and B.
The ones further out give the sum of the digits in the Ath and Bth positions in that direction.

Penpa for example:
https://tinyurl.com/2gzqk9gp
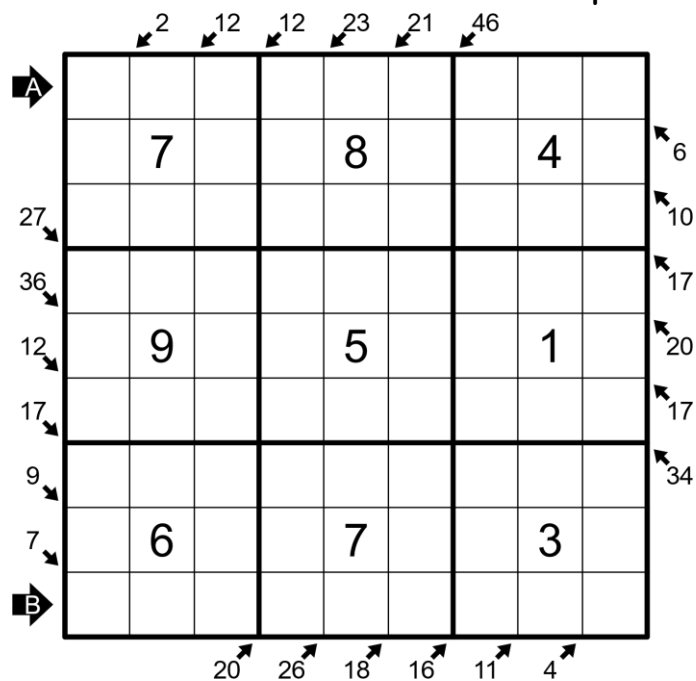
12 Position Sums Sudoku 9x9

9 points

Place a digit from 1 to 9 into each empty cell in the grid so that each digit appears exactly once in each row, column and 3x3 outlined box.
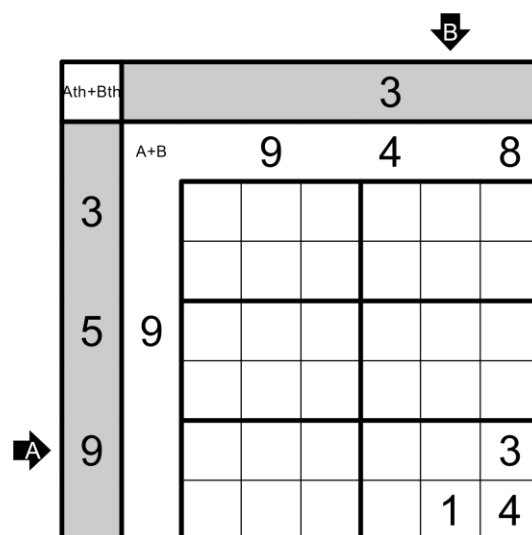
Digits in the first and second cell from the top and from the left are A and B for that column/row. There are two sets of clues outside the grid:
The ones closest to the grid give the sum of A and B.
The ones further out give the sum of the digits in the Ath and Bth positions in that direction.

Penpa for example:
https://tinyurl.com/2pyoa8o6
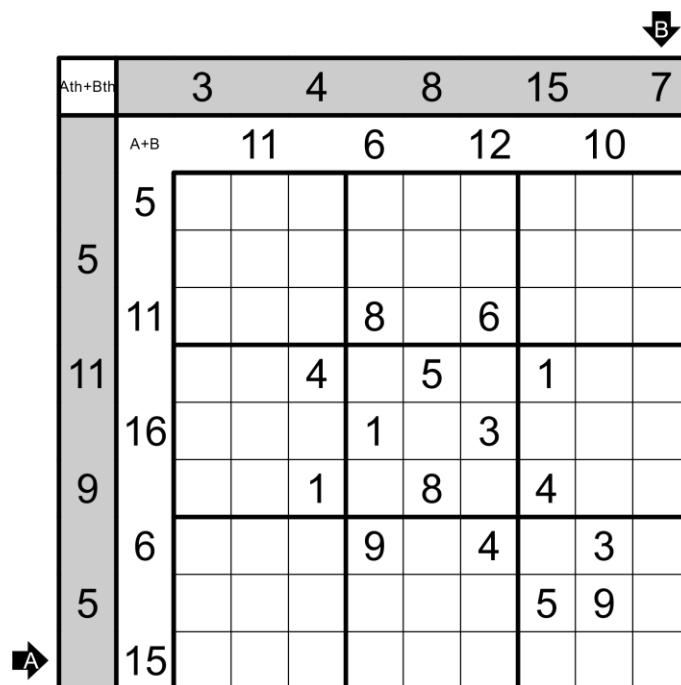
13 No Touch Sudoku 6x6

1 point

Place a digit from 1 to 6 into each empty cell in the grid so that each digit appears exactly once in each row, column and 2x3 outlined box.

Diagonally touching cells must not contain the same digit.

Penpa for example:
https://tinyurl.com/yy5rch5b

14 No Touch Sudoku 9x9

7 points

Place a digit from 1 to 9 into each empty cell in the grid so that each digit appears exactly once in each row, column and 3x3 outlined box.

Diagonally touching cells must not contain the same digit.

Penpa for example:
https://tinyurl.com/y352qvml

15 Kropki Sudoku 6x6

2 points

Place a digit from 1 to 6 into each empty cell in the grid so that each digit appears exactly once in each row, column and 2x3 outlined box.

Adjacent cells marked with a white circle contain consecutive digits. Adjacent cells marked with a black circle contains digits where one digit is double of the other digit. The circle between 1 and 2 can be of either colour. All possible circles are marked.

Penpa for example:
https://tinyurl.com/ym6os5qa

16 Kropki Sudoku 9x9

8 points

Place a digit from 1 to 9 into each empty cell in the grid so that each digit appears exactly once in each row, column and 3x3 outlined box.

Adjacent cells marked with a white circle contain consecutive digits. Adjacent cells marked with a black circle contains digits where one digit is double of the other digit. The circle between 1 and 2 can be of either colour. All possible circles are marked.

Penpa for example:
https://tinyurl.com/yv2d657p
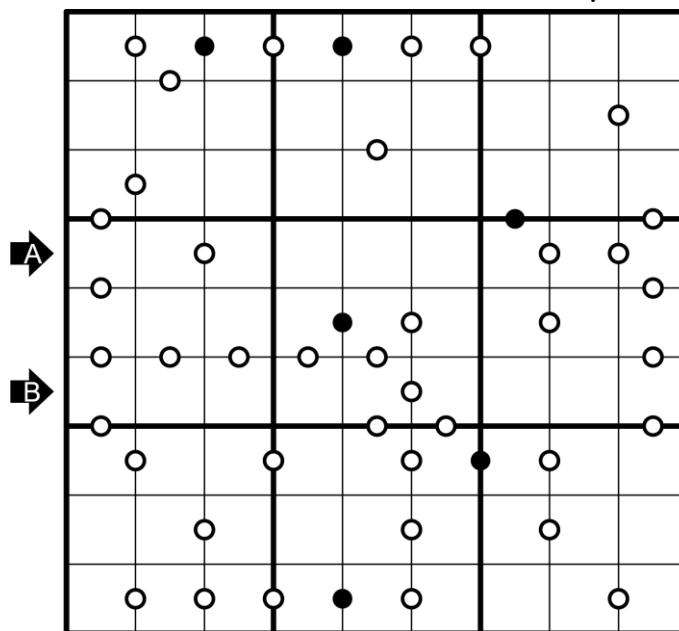
17 XY Differences Sudoku 6x6

4 points

Place a digit from 1 to 6 into each empty cell in the grid so that each digit appears exactly once in each row, column and 2x3 outlined box.

Horizontally adjacent cells marked by a diamond contain digits whose difference is equal to the first (leftmost) digit of the corresponding row. Vertically adjacent cells marked by a diamond contain digits whose difference is equal to the first (topmost) digit of the corresponding column.

All such diamonds are marked.

Penpa for example:
https://tinyurl.com/ypl93ydh

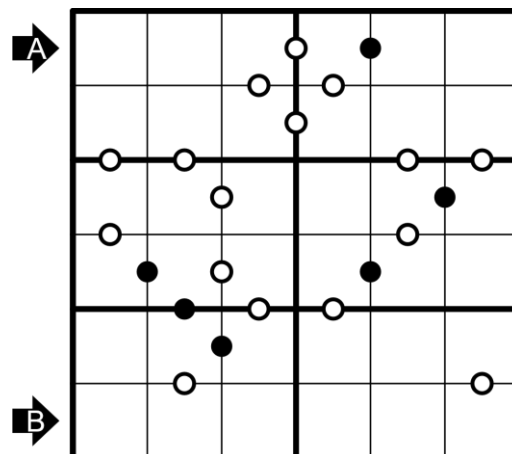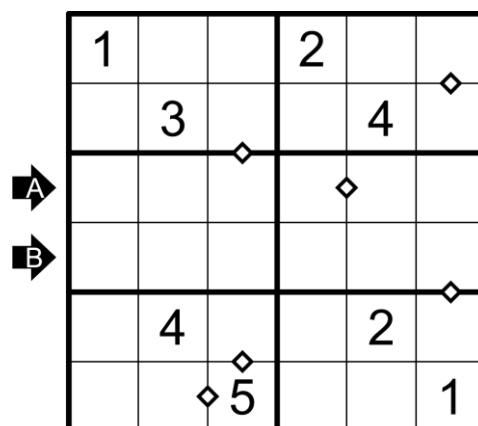## 18 XY Differences Sudoku 9x9

13 points

Place a digit from 1 to 9 into each empty cell in the grid so that each digit appears exactly once in each row, column and 3x3 outlined box.

Horizontally adjacent cells marked by a diamond contain digits whose difference is equal to the first (leftmost) digit of the corresponding row. Vertically adjacent cells marked by a diamond contain digits whose difference is equal to the first (topmost) digit of the corresponding column.

All such diamonds are marked.

Penpa for example:
https://tinyurl.com/yshh624f

Solutions

Classic Sudoku 6x6

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

Key: 412356,325461

Classic Sudoku 9x9

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

Key: 781564329,718369254

Skyscrapers Sudoku 6x6

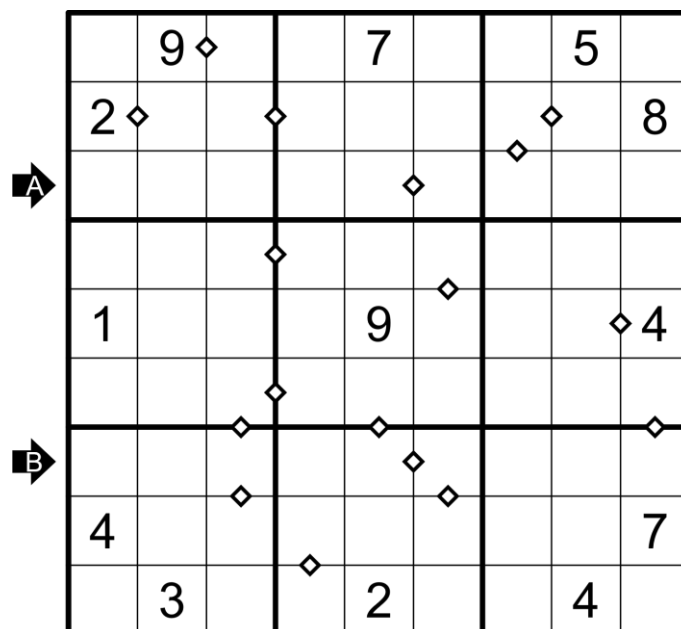| 1	2	3	4	6	5
4	5	6	3	2	1
2	3	4	1	5	6
5	6	1	2	3	4
3	4	5	6	1	2
6	1	2	5	4	3

Key: 456321,625314

Skyscrapers Sudoku 9x9

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

Key: 463519278,147835692

Little Killer Sudoku 6x6

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

Key: 356412,531246

Little Killer Sudoku 9x9

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

Key: 234517896,758391624

Position Sums Sudoku 6x6

	3			
Ath+Bth				

A+B: 9 4 8

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

(Left Ath+Bth: 3 5 9; A+B: 9)

Key: 614523,543621

Position Sums Sudoku 9x9

Ath+Bth (top): 3 4 8 15 7
A+B: 11 6 12 10

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

(Left Ath+Bth: 5 5 11 11 16 9 5 5 15; A+B: 15)

Key: 693571284,852369714

No Touch Sudoku 6x6

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

Key: 654231,351462

No Touch Sudoku 9x9

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

Key: 246598713,715842693

Kropki Sudoku 6x6

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

Key: 513426,135264

Kropki Sudoku 9x9

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

Key: 576819234,382745916

XY Differences Sudoku 6x6

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

Key: 216534,453612

XY Differences Sudoku 9x9

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

Key: 567849321,725418963