The 8th World Sudoku Championship

Instruction Booklet

Instruction Booklet for the 8th World Sudoku Championship

This booklet explains the competition procedures, scoring, and ranking in the league table, as well as types of puzzles in each round. All the examples here are for demonstrative purpose only and they may not be accurate to the degree of difficulty of the competition puzzles. Any questions and queries will be answered during the Q&A session between 9:00-10:00 am on Oct 14th 2013.

General Rules and Procedures

There are 11 preliminary rounds. The Rounds 6-8 are for team competition, where four individuals from each team participate. The rest 8 rounds are for individual competition, where all officially-registered individual players participate. There is no elimination during the preliminary.

Please keep quiet during the individual rounds. No communication is allowed among participants or between participants and the team captain during all these rounds. All the participants should remain seated for the full duration of each round, even when they finish ahead of time. Participants who need to leave their seats for any reason may raise their hands and ask for permission from the judge.

For the team rounds, participants can communicate with each other but they should keep their voices down and remain seated at all times.

No electronic devices (including but not limited to cell phones, laptops, tablets, calculators, and headphones) or any types of paper except this booklet are allowed during the competition.

Participants may choose to use any pens or pencils in any color except red color in all rounds. But in Round 8, there is no using of any pens, rubbers or other utensils.

Scoring Standard

1. Full credit

There is a unique answer for each puzzle. Participants who correctly fill in all numbers for a puzzle get full points.

2. Partial credit

Answers differ by one or two numbers from the correct answer (one incorrect

number, two swapped numbers, or 1-2 missing cells) may be judged as "typo"or writing error and the participant may be given partial credit. Ten points are deducted from the full credit of the puzzle if it is worth more than 10 points. There is no partial credit for puzzles with less than or equal to 10 points.

This rule only applies for individual rounds in the preliminary, not including Round 10 (The Great Wall).

3. No credit

Participants who miss (or incorrectly fill in) 3 or more numbers for a puzzle get zero points.

4. Bonus

Participants who finish ahead of time in each round with no incorrect answers (typos are allowed) get 8 bonus points for each full minute.

5. Team Rounds

Puzzles in team competition have to be correctly solved to earn points (please refer to the instruction for team rounds). Teams which finish ahead of time get 30 bonus points for each full minute. Please note that in Round 6 bonus will only be considered when the sphere is physically constructed. In Round 7, bonus will only be considered when the paired puzzles are both fully filled with identical solution.

6. Procedure for Grading

There is a unique solution for each puzzle. Answer sheets will be collected at the end of each round (except for Round 8), which will be graded by one judge and audited by a different judge. Judges will conclude that the biggest/clearest number filled in each cell is the participants' answer. If there is no number or no telling number among a few numbers in a cell, it will be graded as incorrect. For Round 8，judges will make decision right at the scene, and the team captain or a team member must remain at the seating area to verify the scores. No new challenge can be raised over the score for this round once it has been verified and signed by one of the team members. The teams may keep the Mah-jong tiles for the entertainment activities in the evenings of Oct 16th-17th.

When the result of each round is announce, team captains can retrieve the answered sheets from the judges. Complaints and protests from each team should be reported collectively by the team leader to the head judge no latter than14:00 on Oct 15th.

Ranking of Preliminary Rounds

1. Individual Competition

(1) Ranking will be based on the overall scores from the 8 individual rounds.

(2) For participants having identical overall scores, their ranking will be based on scores from Round 1 and Round 4 (Classic Sudoku).

(3) For participants having identical scores in Round 1 and Round 4, their ranking will be decided by the scores in Round 10 (The Great Wall).

(4) For participants having identical scores in Round 10, their ranking will be tied for consideration for the semi-final.

2. Team Competition

(1) Ranking will be based on the combined total scores of the four individuals of the team in the 8 individual rounds and the total scores of the three team rounds.

(2) If teams have identical overall scores, ranking will be decided by the total scores of the three team rounds.

(3) If again teams have identical scores from the team rounds, ranking will be decided by their scores in Round 6.

(4) If their scores are still identical from Round 6, the ranking will be decided by comparing the worst individual ranking in each team. The team whose worst individual ranking is better will be ranked better for team competition as well.

 (5) If teams have identical worst individual ranking, their team final ranking will be tied.

Note: There is no final for the team competition. The ranking obtained from the preliminary will be the final ranking.

Instructions for Semi-Final and Final

1. Semi-Final

Only the top 10 highest A-team scorers (or more with tied ranking) of 8 individual preliminary rounds will enter the semi-final. No B-team participants or guests are entitled to the semi-final even if their scores are higher than some of the top 10 Team-A players. The 1st-ranking participant can start with a time bonus of 10 minutes ahead of the 10th-ranking participant, while the rest of the participants have time bonuses adjusted accordingly based on their scores in the preliminary.

There are 9 rows of desks in the semi-final, with one puzzle on each row. All participants start from the back row and work their way to the front. Once a participant finishes a puzzle, he/she should raise his/her hand. If the judge confirms that the answer is correct, the participant is allowed to move one row

ahead. Otherwise (if there is one or more incorrect numbers) the participant has to fix the errors and resubmit the answer sheet until all numbers are correct. The judges are given 1 minute to check the answer every time.

There are three sets of puzzles in the semi-final, with three puzzles in each set, including one classic Sudoku and two variants. All variant types have appeared in the preliminary (more information will be announced before the semi-final). The number of desks in each row decreases - there are 10 (or more) desks to start with (the three back rows), 7 desks starting from the 4th puzzle (the three middle rows), and 5 desks starting from the 7th puzzle (the three front rows). The desks will be taken in a first-come-first-serve basis. If all desks in a row are occupied, the participants behind are eliminated.

The semi-final ends when the first three participants finish the last set of puzzles. The third participant earns third place in the Championship, while the top two participants enter the final. The 4th - 10th participants will be ranked based on their seating rows at the end of the semi-final. If there are multiple participants in the same row, their ranking will be determined by their scores from the preliminary. The participant finishing first in the semi-final has the bonus of one more chance to pick a puzzle in the final (see details below).

2. Final

There are 5 puzzles to be solved in the playoffs, which will be held on billboards in front of the audience. In each round, a participant picks one puzzle from a pool of 10 puzzles, and eliminates another puzzle from the pool. The choice alternates between the two finalists - the top participant from the semi-final picks puzzles for Rounds 1, 3, and 5, while the second-place participant picks puzzles for Rounds 2 and 4. The final will be carried out in the same order as the puzzles are picked. In each round, two participants start solving the puzzle simultaneously. Once a participant finishes, he/she should raise his/her hand to signify the judge, and turn around while the judge checks the answer. If the answer is correct, the participant earns1 point and the round terminates. Otherwise, the participant is allowed to fix the errors after 1 minute (the time it takes for the judge to check the answer). The procedure continues until one participant correctly solves the puzzle and the round terminates. The participant who earns 3 points first in the final will be the champion of the Championship, while the other participant will be second place.

Award Criteria

1. Individual Competition

All participants who are officially individual (IO) participants and/or belong to A-teams may enter official ranking. The third place in the individual competition

is determined by the semi-final, while the second place and the champion are determined by the final.

2. Team Competition

Only the A-team from each country may enter official ranking.

3. Groups of Participants 18 and below or 50 and above

All participants in both A- and B- teams as well as IO participants may enter ranking. Ranking for these two categories is based on scores in the preliminary only.

4. UN-Teams

Teams of IO participants not having enough members to qualify as A- or B-teams can unite with IO participants from other countries as UN-teams, however they cannot enter the official ranking for the team competition. Guests from all countries are welcome to participate in the competition, however they cannot enter any official ranking or be considered for awards either.

Round 1: Classic Sudoku

Oct 14th, 10:00 – 10:30, 30 Minutes

18 Classic Sudoku

4×4 Sudoku·· ×1
6×6 Sudoku··· ×3
Classic Sudoku···×14

Total Points: 200

1. 4×4 Sudoku··1 pt
2. 6×6 Sudoku·· 3 pts
3. 6×6 Sudoku·· 3 pts
4. 6×6 Sudoku·· 5 pts
5. Classic Sudoku··· 6 pts
6. Classic Sudoku··· 8 pts
7. Classic Sudoku··10 pts
8. Classic Sudoku··10 pts
9. Classic Sudoku··12 pts
10. Classic Sudoku·· 13 pts
11. Classic Sudoku·· 13 pts
12. Classic Sudoku·· 15 pts
13. Classic Sudoku·· 15 pts
14. Classic Sudoku·· 16 pts
15. Classic Sudoku·· 17 pts
16. Classic Sudoku·· 17 pts
17. Classic Sudoku·· 18 pts
18. Classic Sudoku·· 18 pts

Round 2: Common Variant Sudoku

Oct 14th, 10:50 – 12:18, 88 Minutes

18 Common Variant Sudoku

Total Points: 600

1. Pyramid Sudoku···25 pts
2. Property Sudoku··24 pts
3. Non-Consecutive Sudoku··49 pts
4. ISO Sudoku··47 pts
5. Six Point Star Sudoku···21 pts
6. Tight Fit Sudoku··21 pts
7. Ring Sudoku··20 pts
8. Inequality Sudoku···45 pts
9. 1-Consecutive Sudoku···42 pts
10. No Touch Sudoku··28 pts
11. Nine Dragons Sudoku··40 pts
12. Disjoint Groups Sudoku··46 pts
13. Extra-Region Sudoku···31 pts
14. Blackout Sudoku···27 pts
15. Kropki Sudoku··35 pts
16. Non-Main Diagonals Sudoku··21 pts
17. Interconnected Sudoku···33 pts
18. Fortress Sudoku··45 pts

1. Pyramid Sudoku:
Fill in the grid so that every row, column, 3×3 box, and four extra shaded region contains the digits 1 through 9.

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

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

2. Property Sudoku:
Fill in the grid so that every row, column, and 2×4 box contains the digits 1 through 8. The indicator symbols on the outside indicate the property of the first two numbers along that row or column: odd/ 奇 (1, 3, 5, 7), even/偶 (2, 4, 6, 8), big/大 (5, 6, 7, 8), or small/小 (1, 2, 3, 4).

Left grid — top labels: 小 Small, 奇 Odd, 小 Small; left labels: 奇 Odd, 偶 Even, 大 Big; right labels: 偶 Even, 大 Big, 小 Small; bottom labels: 偶 Even, 大 Big, 奇 Odd.

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

Right grid — top labels: 小 Small, 奇 Odd, 小 Small; left labels: 奇 Odd, 偶 Even, 大 Big; right labels: 偶 Even, 大 Big, 小 Small; bottom labels: 偶 Even, 大 Big, 奇 Odd.

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

3. Non-Consecutive Sudoku: Fill in the grid so that every row, column, and 3×3 box contains the digits 1 through 9. The difference between any two horizontally or vertically adjacent cells cannot be 1.

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

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

4. ISO Sudoku: Fill in the grid so that every row, column, and 3×3 box contains the digits 1 through 9. Digits do not repeat along any of the three directions in which the hexagonal cells share edges.

5. Six Point Star Sudoku: Fill in the grid so that every big triangle contains the digits 1 through 9. Digits do not repeat along any row of cells in each of the three directions indicated by the three arrows.
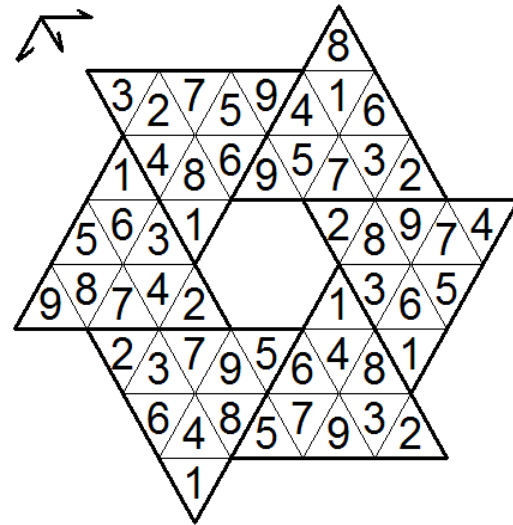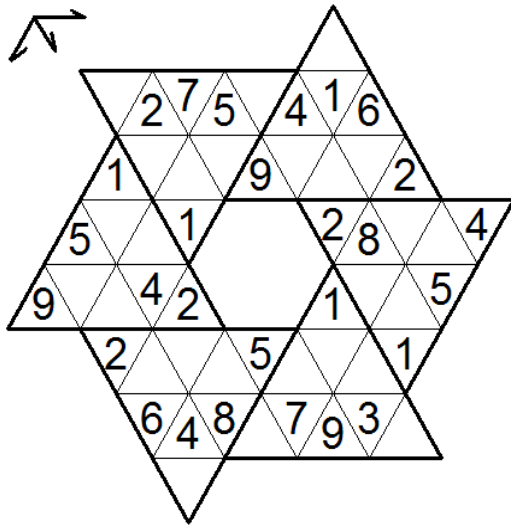
6. Tight Fit Sudoku: Fill in the grid so that every row, column, and 2×3 box contains the digits 1 through 9. In the grid there are some cells with slashes. Two numbers go into these cells, with the smaller number on top.
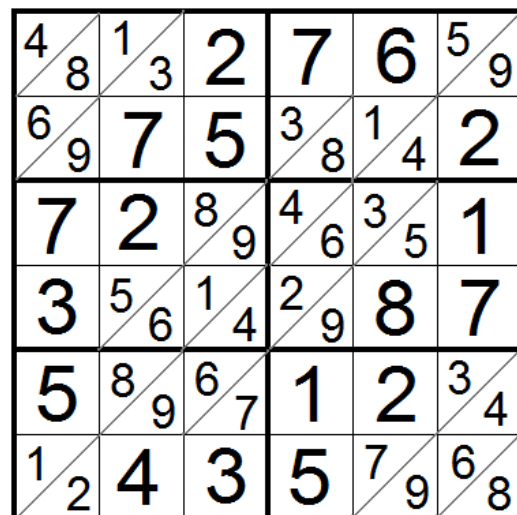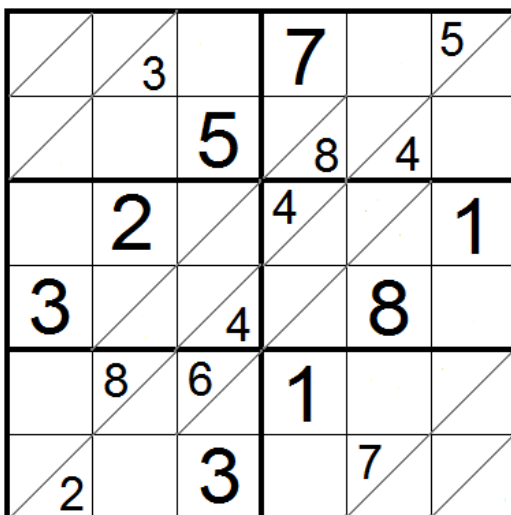
7. Ring Sudoku:
Fill in the grid with digits 0 through 9 so that digits do not repeat in each ring, each sector between two adjacent thick lines, or each pair of opposite sectors along the same diameter.
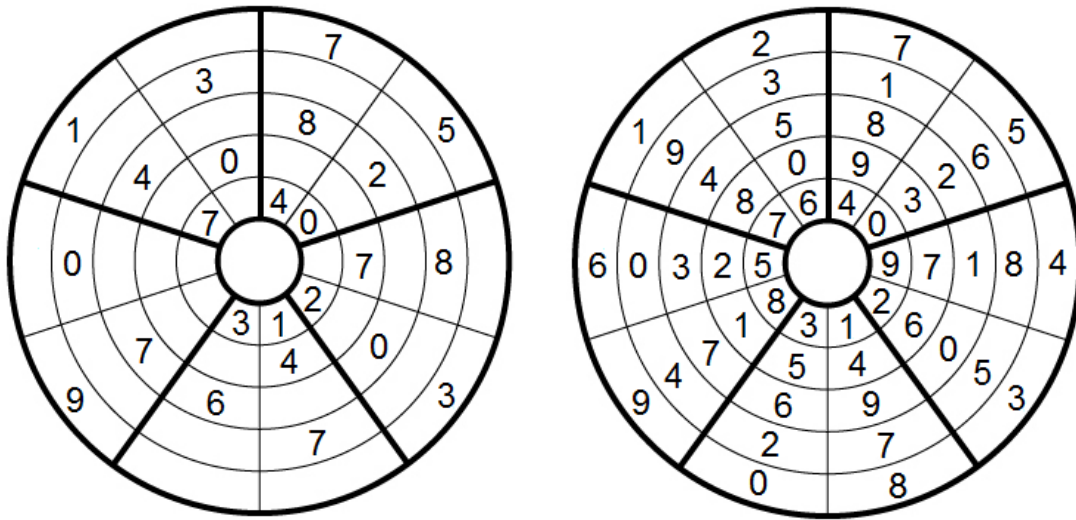
8. Inequality Sudoku:
Fill in the grid so that every row, column, and 3×3 box contains the digits 1 through 9. The cells should satisfy '>' (greater than) and '<' (less than) signs.

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

9. 1-Consecutive Sudoku:
Fill in the grid so that every row, column, and 3×3 box contains the digits 1 through 9. All cells adjacent to 1 must be filled with composite numbers.

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

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

10. No Touch Sudoku:
Fill in the grid so that every row, column, and 3×3 box contains the digits 1 through 9. The same digits cannot touch each other, not even diagonally.

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

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

11. Nine Dragons Sudoku:
Fill in the grid so that every row, column, 3×3 box, and labeled path contains the digits 1 through 9.

Solution:

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

12. Disjoint Groups Sudoku:
Fill in the grid so that every row, column, and 3×3 box contains the digits 1 through 9. Digits do not repeat in cells at the same position among the 3×3 boxes.

Solution:

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

13. Extra-Region Sudoku:
Fill in the grid so that every row, column, 3×3 box, and extra shaded region contains the digits 1 through 9.

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

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

14. Blackout Sudoku:
Fill in digits 1-9 to empty cells so that the digits in every row, column, and 3×3 box do not repeat. The black cells should be left blank, with only 8 digits in each row, column, and 3×3 box.

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

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

15. Kropki Sudoku: Fill in the grid so that every row, column, and 3×3 box contains the digits 1 through 9. All neighboring grid cells containing digits with difference 1 have a white dot between them. All neighboring grid cells in which one digit is exactly two times the other have a black dot between them. Between the digits 1 and 2 there can be either a white or a black dot.
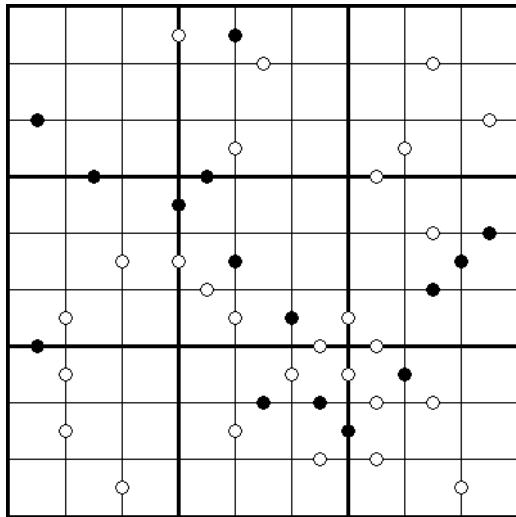
7	5	2	3	6	8	1	4	9
4	9	6	1	7	2	8	5	3
8	3	1	4	5	9	6	7	2
1	6	4	2	9	5	7	3	8
5	8	7	6	3	1	9	2	4
3	2	9	7	8	4	5	1	6
6	7	5	9	2	3	4	8	1
2	1	8	5	4	6	3	9	7
9	4	3	8	1	7	2	6	5

16. Non-Main Diagonals Sudoku: Fill in the grid so that every row, column, and 3×3 box contains the digits 1 through 9. Numbers cannot repeat in any of the diagonals drawn on the grid.

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

17. Interconnected Sudoku: Fill in the grid so that every row, column, and 3×3 box contains the digits 1 through 9. The puzzle consists of two interconnected Sudoku puzzles, one with bold and the other with dotted lines.

Left grid (clues):

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

Right grid (solution):

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

18. Fortress Sudoku: Fill in the grid so that every row, column, and 3×3 box contains the digits 1 through 9. The digit in each grey cell is larger than any of the digits in its horizontally or vertically adjacent white cells.

Left grid (clues):

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

Right grid (solution):

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

Round 3: Jigsaw Sudoku

Oct 14th, 12:40 – 12:55, 15 Minutes

1 Jigsaw Sudoku
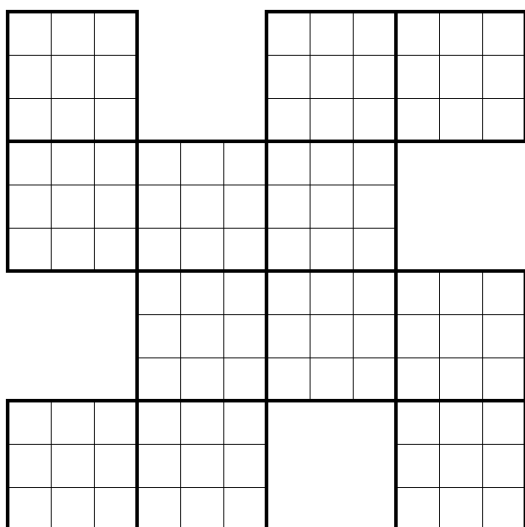
Total Points: 100/50/20

Place the Sudoku jigsaw pieces on the right into the grid on the left, and fill in the empty cells so that every row, column, and 3×3 box on the grid contains digits 1 through 9. Jigsaw pieces cannot be rotated, flipped, or placed on top of each other.

Jigsaw pieces will be provided in three difficulty levels. Level A (highest difficulty) has minimal hints, highest points, and bonus points if finished early. Level B (medium difficulty) has intermediate hints and intermediate points, but no bonus points even if finished early. Level C (lowest difficulty) has most hints, least points, and no bonus points as Level B. Pieces for the three levels will be handed out in separate, sealed envelopes.

Scoring：

1. If participant has only opened Envelope A to solve the puzzle, he/she will earn 100 points if the answer is correct. 8 bonus points will be awarded for every full minute if the puzzle is finished early.
2. If participant has opened Envelope B (but not C) to solve the puzzle, he/she will earn 50 points if the answer is correct. There is no bonus for finishing early.
3. If participant has opened Envelope C to solve the puzzle, he/she will earn 20 points if the answer is correct. There is no bonus for finishing early.

Please note that the envelopes will be collected together with the answer sheets at the end of the round. Participants may choose to open any envelope at any time during this round; however they can only earn 50 (or 20) points once Envelope B (or C) is opened. If one or more envelopes are missing, it will also be taken as indication that hints at the corresponding levels are used.

Top puzzle grids

Grid A

	8	
1	3	2
7		9
8		7
3	2	5
	9	

Grid B

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

Grid C

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

Grid D

	7	3	8	1
8	6			4	9
	9	1	6	7

Grid E

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

Grid F

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

Bottom large grid

Top-left block:

5	8	6
1	3	2
7	4	9

Top-right block:

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

Middle block:

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

Lower-middle block:

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

Bottom-left block and bottom-right block:

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

Round 4: Classic Sudoku 2.0

Oct 14th, 15:00 – 15:35, 35 Minutes

8 Classic Sudoku

Total Points: 230

1. Classic Sudoku···22 pts
2. Classic Sudoku···22 pts
3. Classic Sudoku···24 pts
4. Classic Sudoku···28 pts
5. Classic Sudoku···30 pts
6. Classic Sudoku···32 pts
7. Classic Sudoku···36 pts
8. Classic Sudoku···36 pts

Round 5: $+-\times\div$

Oct 14th, 15:50 – 16:30, 40 Minutes

8 Variant Sudoku with Mathematical Operations

Total Points: 250

1. Sum Sudoku···35 pts
2. Killer Sudoku··26 pts
3. Arrow Sudoku··· 32 pts
4. Outside Sum Sudoku································· 10 pts
5. Product Sudoku··30 pts
6. Star Product Sudoku·····································28 pts
7. Ratio Sudoku··34 pts
8. Mathdoku·· 55 pts

1. Sum Sudoku: Fill in the grid so that every row, column, and 3×3 box contains the digits 1 through 9. Numbers given between cells represent the sum of the two digits.

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

2. Killer Sudoku: Fill in the grid so that every row, column, and 3×3 box contains the digits 1 through 9. The sum of the cells in the cage must equal the total given in the upper left of the cage. Each digit in the cage must be unique.

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

3. Arrow Sudoku: Fill in the grid so that every row, column, and 3×3 box contains the digits 1 through 9. The sum of all the digits along an arrow's path must equal the digit in the circled cell at the start of the arrow. Digits can repeat along an arrow.

4. Outside Sum Sudoku: Fill in the grid so that every row, column, and region contains digits 1 through 5. Numbers on the right represent the sum of all numbers in the corresponding row (created by the thick lines), with '-' indicating unknown digits. The first digit of a sum cannot be 0.

5. Product Sudoku: Fill in the grid so that every row, column, and 3×3 box contains the digits 1 through 9. In each gray square of four cells, the two bottom cells make up a two-digit number which is the product of the two digits in the upper cells.

Puzzle grid:

1								
	9				4		3	
		5	1					
	1		5					
4		9		1		3		5
				8		9		
				1	6			
	4		6				1	
								9

Solution:

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

6. Star Product Sudoku: Fill in the grid so that every row, column, and 3×3 box contains the digits 1 through 9. Numbers around the grid indicate the product of digits in all cells marked with stars in the corresponding row/column.

Puzzle grid — top clues: 144 96 63 60 42 90 108 108 35

		*			*	*	3		360
	*		*					*	42
	*			*		*			504
*			1	*					6
	*		*		*		*		105
*		*		7		*			144
	*				*	*			72
*		*				*			120
1				*		*	*		135

Solution — top clues: 144 96 63 60 42 90 108 108 35

7	1	9	4	6	5	8	2	3	360
5	3	6	2	8	9	4	1	7	42
4	8	2	3	7	1	9	5	6	504
3	5	4	1	2	8	7	6	9	6
2	6	7	9	3	4	5	8	1	105
8	9	1	6	5	7	2	3	4	144
9	4	5	8	1	6	3	7	2	72
6	7	3	5	9	2	1	4	8	120
1	2	8	7	4	3	6	9	5	135

7. Ratio Sudoku:
Fill in the grid so that every row, column, and 3×3 box contains the digits 1 through 9. Fractions between cells indicate the ratio between the two adjacent digits.

(empty puzzle grid with clues: 2/3, 4/9, 1/4, 1/3, 8/9, 5/8, 5/7, 2/3, 3/7, 5/8, 2/9, 2/9, 1/2, 3/4, 1/2, 1/8, 5/8, 1/3, 3/4, 2/3)

Solution:

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

8. Mathdoku:
Fill in the grid so that every row, column, and 3×3 box contains the digits 1 through 9. Numbers between cells indicate the LAST DIGIT of the result of applying a binary operation (addition, subtraction, multiplication, or division) between the two adjacent numbers. All four binary operations must be used once in each box.

(empty puzzle grid with clues)

Solution:

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

Round 6 (TEAM): Ball Sudoku

Oct 14th, 17:10 – 17:35, 25 Minutes

1 3-D Interconnected Sudoku

Total Points: 750

Combine six 9-digit classic Sudoku and twelve 4-digit Sudoku into a spherical Sudoku as shown in the example. Fill in the grid for each 9-digit classic Sudoku so that every row, column, and 3×3 box contains the digits 1 through 9. Digits in the 4-digit Sudoku are already given. Each 4-digit Sudoku contains 4 different digits, and the correct digit in each cell can be identified as the one in the upper left corner of the cell.

Use one 4-digit Sudoku piece to connect two 9-digit Sudoku pieces, with the four digits in one 2×2 box of the 4-digit Sudoku completely overlapping the four digits in one corner of one 9-digit Sudoku.

120 points will be awarded for each correctly filled 9-digit Sudoku. 30 bonus points will be awarded for correctly filling all 9-digit Sudoku pieces and successfully combining the pieces into a sphere. If a team finishes ahead of time with the correct answer, 30 bonus points will be awarded for every full minute.

Examples of 9-digit Sudoku pieces are shown below. There will be 6 pieces for this puzzle.

Example of 4-digit Sudoku pieces is shown below. There will be 12 pieces.

The following figures demonstrate how to combine the pieces. Identify the corner of the 9-digit Sudoku which has the same 4 digits as in a box of the 4-digit Sudoku, and glue together the two pieces by their overlapping region. Link the 12 pieces of 4-digit Sudoku and 6 pieces of 9-digit Sudoku into a hollow sphere following the same rule.

After combining the three pieces:

End result – hollow sphere:
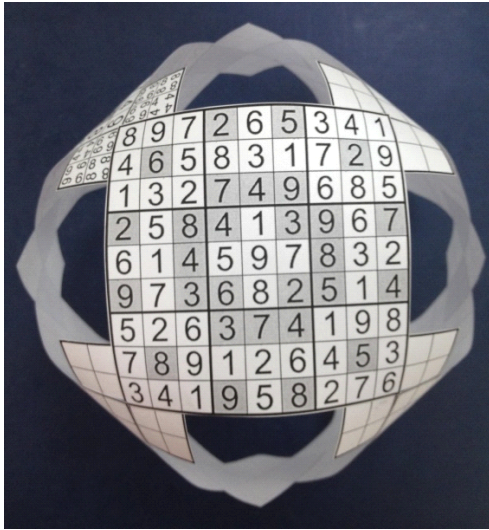
Top-down view
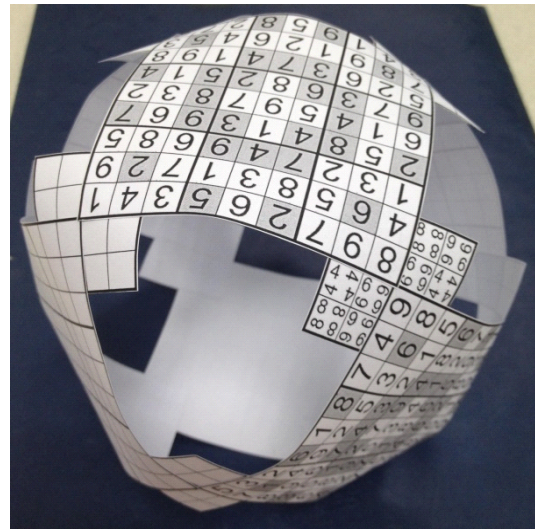
Side view

Round 7 (TEAM): Match Sudoku

Oct 14th, 18:00 – 18:30, 30 Minutes

8 Variant Sudoku

Total Points: 800

Match eight variants of Sudoku into four pairs of two. The two puzzles within each pair have identical answers. Fill in the grid for each puzzle using the combined rules within the pair. 100 points will be awarded for each puzzle correctly answered. If a team finishes ahead of time with correct answers for all eight puzzles, 30 bonus points will be awarded for every full minute.

Example:

1. Diagonal Sudoku: Fill in the grid so that every row, column, 3×3 box, and the two main diagonals contain the digits 1 through 9.
2. Antichess Sudoku: Fill in the grid so that every row, column, and 3×3 box contains the digits 1 through 9. The same digits are not chess-knight-move connected.

By identifying these two puzzles as a pair and combining their rules, a unique answer can then be obtained.

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

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

Round 8 (TEAM): Mah-jong Sudoku

Oct 14th, 18:50 – 19:20, 30 Minutes

1 Mah-jong Sudoku

Total Points: 800

Complete the following Sudoku using Mah-jong tiles. Place the 81 given tiles into a 9×9 plate so that every row, column, and 3×3 box contains the numbers 1 through 9, with exactly three tiles from each of the three suits (see illustration below). Tiles placed along the labeled lines have to follow the rules given below.

No pen, pencil, or other tools are allowed in this round. The number of each Mah-jong tile will be labeled at its bottom as Arabic numerals for participants who are not familiar with Mah-jong. 10 points will be awarded for each correctly placed tile, while 10 points will be deducted for each incorrectly placed tile. If a team finishes ahead of time with correct placement of all 81 tiles, 30 bonus points will be awarded for every full minute.

Suits of Mah-jong tiles:

Note: A set of Mah-jong tiles has four identical copies of each tile. The 81 tiles used in this round are picked from one set of tiles, which may or may not consist of full suits.

Character/Wan Suit (1Wan ~ 9Wan):

Bamboo/Sow Suit (1Sow ~ 9Sow):
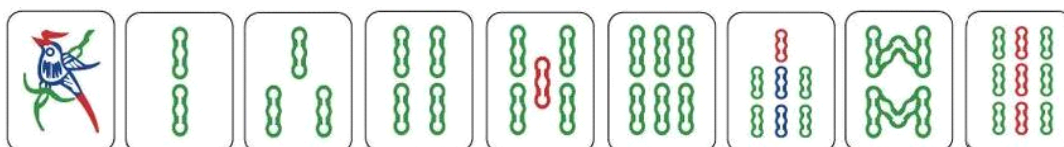
Circle/Pin Suit (1Pin~9Pin):
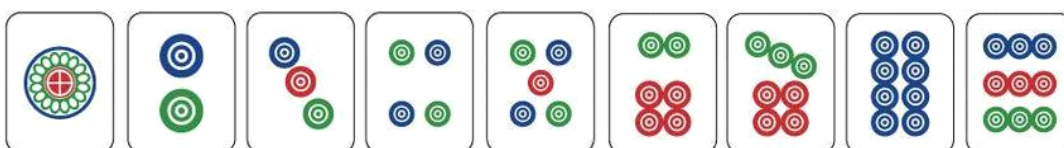
Rules as illustrated by lines:

1. Red single line with double arrows connecting 9 cells: Straight Flush Dragon, where the tiles are 1 through 9 from the same suit with their numbers increasing along either direction.
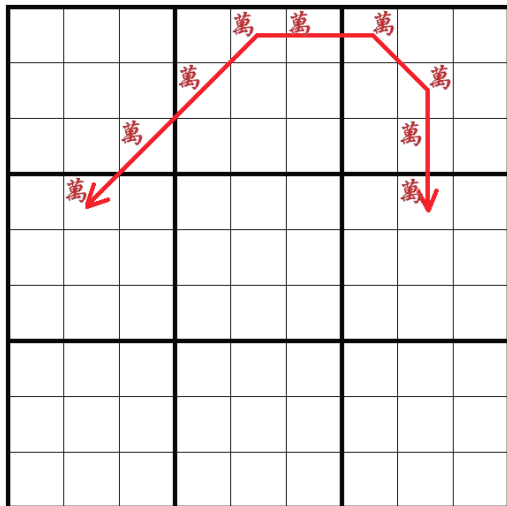
Line representing Straight Flush Dragon
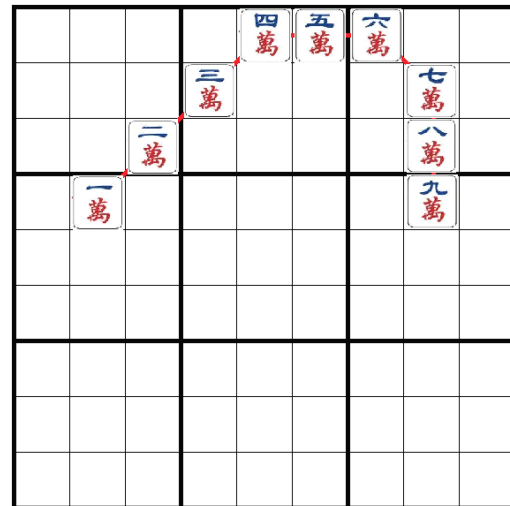
Tiles representing Straight Flush Dragon

2. Green double line with double arrows connecting 9 cells: Mixed Shifted Pungs. The cells contain 3 tiles from each of the three suits, where the tiles from the same suit have the same numbers, and the numbers of tiles from different suits increase consecutively by one, e.g., 555-666-777. The order of the tiles can go in either direction.
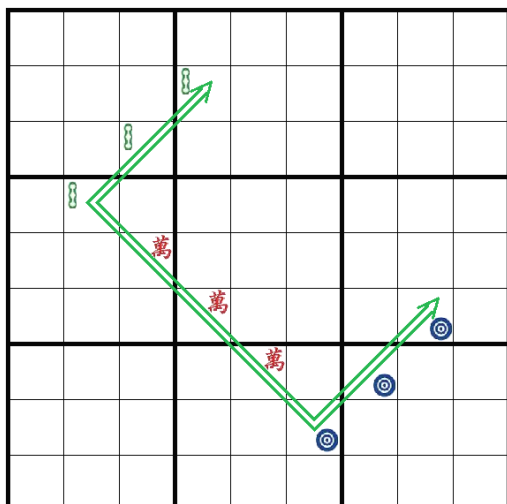
Line representing Mixed Shifted Pungs
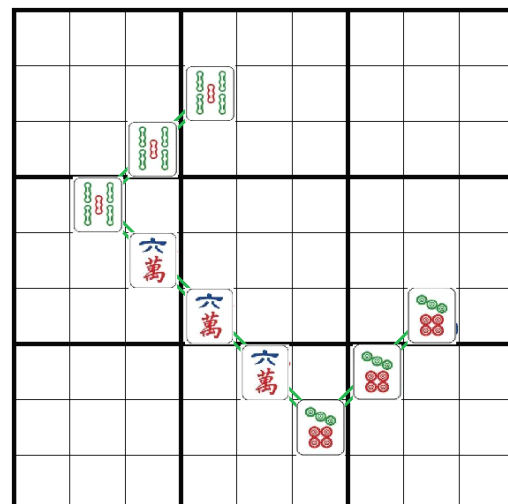
Tiles representing Mixed Shifted Pungs

3. Blue single line with double arrows connecting 9 cells, divided by two triangles: Mixed Shifted Chows. The cells contain 3 tiles from each of the

three suits, where the tiles from the same suit are of consecutive numbers, and tiles from a different suit have numbers shifted up by 1. Tiles along the line have to be placed in strictly increasing order, first within suits then among suits, e.g., 345-456-567. The order of the tiles can go in either direction.
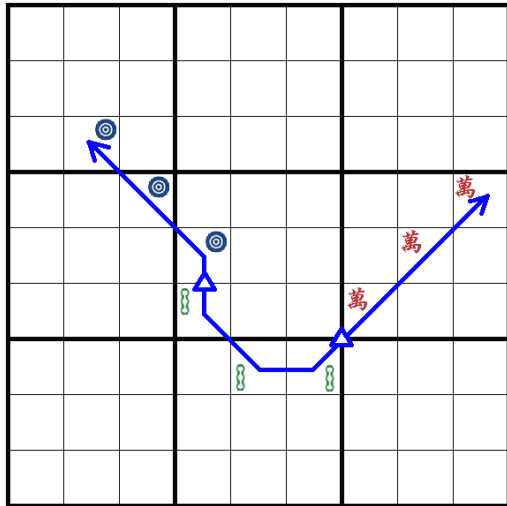
Line representing Mixed Shifted Chows
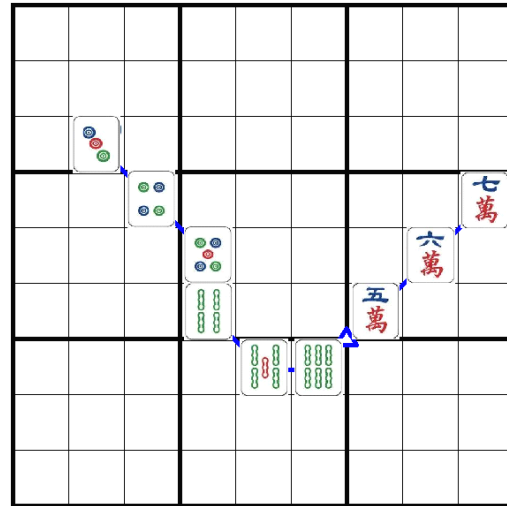
Tiles representing Mixed Shifted Chows

4. Red single line: Flush, where cells contain tiles from the same suit. Repeat numbers are allowed.

5. Blue dashed line connecting three cells: Octave, where cells contain three tiles from the same suit, and the number of each subsequent tile increases by three, e.g., 1-4-7, 2-5-8, or 3-6-9. The order of the tiles has to be preserved but can go in either direction.

6: Green double line connecting 3 cells: Pung, where the three tiles are completely identical.

7. Green double line connecting 2 cells: Pair, where the two tiles are completely identical.
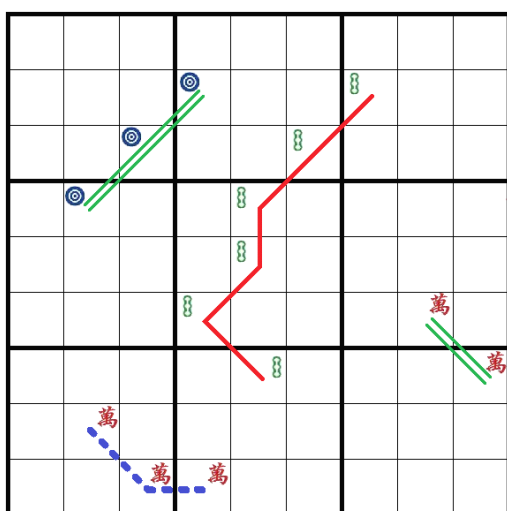
Lines representing Rules 4-7
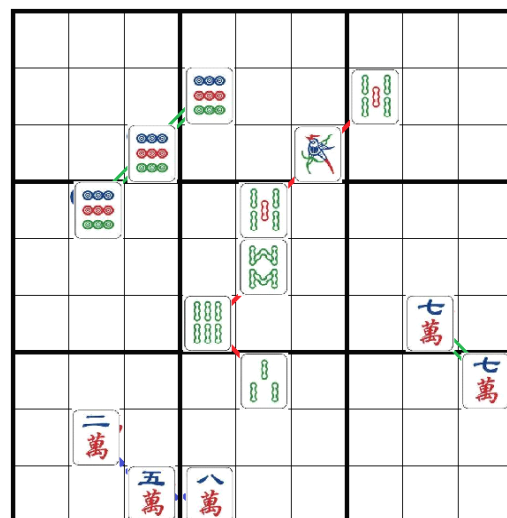
Tiles representing Rules 4-7

Round 9: Close Relative Sudoku

Oct 15th, 9:00 – 10:28, 88 Minutes

16 Variant Sudoku(8 Related Pairs)

Total Points: 600

1. Diagonal Sudoku·· 24 pts
2. Antidiagonal Sudoku···24 pts
3. Irregular Sudoku·· 26 pts
4. Halved Squares Sudoku······································ 41 pts
5. Odd Sudoku··· 23 pts
6. Odd-Even Consecutive Sudoku······························ 40 pts
7. Consecutive Sudoku··39 pts
8. X-Difference Sudoku···44 pts
9. Outside Sudoku···26 pts
10. 6-Cell Outside Sudoku······································66 pts
11. Skyscrapers Sudoku···43 pts
12. Within Box Skyscrapers Sudoku···························50 pts
13. Anti-Knight Sudoku·· 27 pts
14. Anti-Knight-and-Queen Sudoku····························32 pts
15. Renban Group Sudoku··50 pts
16. Outside Consecutive Sudoku·······························45 pts

1. Diagonal Sudoku:
Fill in the grid so that every row, column, 3×3 box, and the two main diagonals contain the digits 1 through 9.

Puzzle:

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

Solution:

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

2. Antidiagonal Sudoku:
Fill in the grid so that every row, column, and 3×3 box contains digits 1 through 9. Each diagonal line spans the same set of three digits in each of the three 3x3 boxes it crosses.

Puzzle:

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

Solution:

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

3. Irregular Sudoku: Fill in the grid so that every row, column, and region contains the digits 1 through 9.

Puzzle:

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

Solution:

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

4. Halved Squares Sudoku: Fill in the grid so that every row, column, and region contains the digits 1 through 9. For cells divided into two halves by diagonal lines, only one half is occupied.

Puzzle:

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

Solution:

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

5. Odd Sudoku:
Fill in the grid so that every row, column, and 3×3 box contains the digits 1 through 9. The grey cells should only contain odd numbers.

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

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

6. Odd-Even Consecutive Sudoku:
Fill in the grid so that every row, column, and 3×3 box contains the digits 1 through 9. The two adjacent cells divided by a grey line contain one even number and one odd number.

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

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

7. Consecutive Sudoku: Fill in the grid so that every row, column, and 3×3 box contains the digits 1 through 9. If a bar is given between two adjacent cells, then the two numbers in those cells must be consecutive. If a bar is not given, the two digits cannot be consecutive.

Puzzle grid (givens):

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

Solution grid:

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

8. X-Difference Sudoku: Fill in the grid so that every row, column, and 3×3 box contains the digits 1 through 9. Adjacent cells with difference X between the two numbers are divided by a thick line, where X is an unknown but fixed integer between 1 and 8. Difference between the two numbers in adjacent cells not divided by a thick line does not equal X.

Puzzle grid (givens):

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

Solution grid:

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

9. Outside Sudoku:
Fill in the grid so that every row, column, and 3×3 box contains the digits 1 through 9. Digits given outside the grid must appear in the first region (three cells) in that row/column.

Empty grid (top clues): 3 4 5 | 8 9 | 1 2 | 8 9 | 1 3 | 6 7 | 5 6 | | 8 9

Left clues: 58, 67, 68, 234, 1, 34
Right clues: 13, 45, 34, 57, 89, 456, 12
Bottom clues: 6 7 | 2 3 | 8 9 | 6 7 | 8 9 5 | 3 4 | 7 8 | 1 9 | 2 3

Solution grid:

3 4 5	8 9	1 2	8 9	1 3	6 7	5 6		8 9	
4	9	2	8	5	6	3	7	1	13
5	8	1	4	3	7	6	2	9	58
3	6	7	9	1	2	5	4	8	67 / 45
9	7	5	2	6	8	1	3	4	34
8	1	6	3	4	9	2	5	7	68 / 57
2	4	3	5	7	1	9	8	6	234 / 89
1	5	8	6	2	4	7	9	3	1
7	2	9	1	8	3	4	6	5	456
6	3	4	7	9	5	8	1	2	34 / 12

Bottom clues: 6 7 | 2 3 | 8 9 | 6 7 | 8 9 5 | 3 4 | 7 8 | 1 9 | 2 3

10. 6-Cell Outside Sudoku:
Fill in the grid so that every row, column, and 3×3 box contains the digits 1 through 9. Digits given outside the grid represent some of the digits in the first 6 cells encountered in that row/column in the corresponding direction, with the same order as given.

Empty grid (top clues): 8 5 1 | 6 2 | 5 2 4 | 3 5 | 4 6 8 | 6 4 | 1 5 3 | 5 6 | 3 1 7

Left clues: 382, 64, 726, 76, 328, 54, 265, 28, 514
In-grid givens: row2 col4 = 4; row5 col2 = 6; row5 col7 = 4; row8 col5 = 2
Right clues: 146, 75, 935, 96, 254, 76, 691, 83, 432
Bottom clues: 3 2 6 | 2 8 | 9 8 7 | 2 6 | 9 7 3 | 1 7 | 5 9 6 | 4 6 | 1 4 2

Solution grid:

8 5 1	6 2	5 2 4	3 5	4 6 8	6 4	1 5 3	5 6	3 1 7	
9	3	5	8	1	2	4	7	6	382 / 146
8	1	6	7	4	5	2	9	3	64 / 75
7	4	2	9	6	3	1	5	8	726 / 935
5	7	4	3	9	6	8	2	1	76 / 96
3	6	9	2	8	1	5	4	7	328 / 254
1	2	8	5	7	4	3	6	9	54 / 76
2	8	3	6	5	7	9	1	4	265 / 691
4	9	7	1	2	8	6	3	5	28 / 83
6	5	1	4	3	9	7	8	2	514 / 432

Bottom clues: 3 2 6 | 2 8 | 9 8 7 | 2 6 | 9 7 3 | 1 7 | 5 9 6 | 4 6 | 1 4 2

11. Skyscrapers Sudoku: Fill in the grid so that every row, column, and 3×3 box contains the digits 1 through 9. Consider each number to be the height of a building. The numbers outside the grid indicate how many buildings can be seen when looking in that direction (taller buildings conceal smaller buildings behind them).

Puzzle grid (with edge clues):

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

Solution grid (with edge clues):

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

12. Within Box Skyscrapers Sudoku: Fill in the grid so that every row, column, and 3×3 box contains the digits 1 through 9. Consider each number to be the height of a building. Digits within cells with arrows indicate how many buildings can be seen when looking in that direction from the focal cells (taller buildings conceal buildings smaller or of equal height behind them).

Puzzle grid:

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

Solution grid:

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

13. Anti-Knight Sudoku: Fill in the grid so that every row, column, and 3×3 box contains the digits 1 through 9. The same digits are not chess-knight-move connected.

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

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

14. Anti-Knight-and-Queen Sudoku: Fill in the grid so that every row, column, and 3×3 box contains the digits 1-7 as well as characters N and Q. Character N's are not chess-knight-move connected. Character Q's cannot repeat along any diagonal line.

3				6		Q		4
	2						7	
		7		4	2			5
					6	2		
	4		5	3	N		Q	
		6	2					
1			4	5		7		
	7						1	
5		2		N				Q

3	1	5	N	6	7	Q	2	4
N	2	4	Q	1	5	3	7	6
6	Q	7	3	4	2	1	N	5
7	5	N	1	Q	6	2	4	3
2	4	1	5	3	N	6	Q	7
Q	3	6	2	7	4	N	5	1
1	N	Q	4	5	3	7	6	2
4	7	3	6	2	Q	5	1	N
5	6	2	7	N	1	4	3	Q

15. Renban Group Sudoku:
Fill in the grid so that every row, column, and 3×3 box contains the digits 1 through 9. Each grey region contains a set of consecutive digits, with no constraint on the order of the digits.

Puzzle:

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

Solution:

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

16. Outside Consecutive Sudoku:
Fill in the grid so that every row, column, and 3×3 box contains the digits 1 through 9. Pairs of digits on the left and top of the grid represent the starting and ending points of a string of consecutive digits in the corresponding row/column. Digits within the consecutive string do not have to follow any particular order. Not all consecutive strings are identified.

Puzzle (top clues: 5/8, 6/9, 4/6):

	5 8			6 9			4 6	
26								
		9		2	5	7		
	4		1				2	
34	9	2	5				8	
79								
57	6				2	1	4	
	7				3		5	
		6	7	4		2		
67								

Solution (top clues: 5/8, 6/9, 4/6):

	5 8			6 9			4 6	
26	7	2	5	4	3	6	8	9	1
	6	1	9	8	2	5	7	3	4
	8	4	3	1	9	7	6	2	5
34	1	9	2	5	6	4	3	8	7
79	4	3	8	9	7	1	5	6	2
57	5	6	7	3	8	2	1	4	9
	2	7	4	6	1	3	9	5	8
	9	5	6	7	4	8	2	1	3
67	3	8	1	2	5	9	4	7	6

41

Round 10: The Great Wall

Oct 15th, 10:50 – 11:05, 15 Minutes

1 Interconnected Sudoku

Total Points: 100

Fill in the grid of five interconnected classic Sudoku, so that each row, column, and 3×3 box in each Sudoku contains the digits 1 through 9.
20 points will be awarded for each correctly filled Sudoku.

(Upper puzzle grids — interconnected, with given clues)

Top-left grid
```
9 . 2 . 5 . . . 1
. . . 4 7 6 . . .
4 . 5 . 2 . 3 . .
. 2 . . 7 . 1 . .
. 9 . 8 . . . 5 .
. 1 . 2 . 5 7 6 .
. . . . 4 . . . .
3 . 7 . . . . . .
. . . 7 . 9 . . .
```

Top-center grid
```
3 . 5 . 8 . 4 . 9
. . . . 4 9 5 . .
7 . 4 . . . 2 . 8
. 1 . 5 . 3 . 8 .
. . 5 . 2 . 9 . 3
. . 3 2 8 . 1 5 9
4 . 8 . . 6 . 7 .
1 . 6 . . . 3 . 5
1 . 6 . . . 3 . 4
```

Top-right grid
```
5 . . . 4 . 2 . 1
. . . . 9 2 1 . .
. . . 9 . 5 . 4 . 8
. 8 . 4 . . . 5 .
. 1 . . . 2 . 6 .
. 5 4 3 . . 7 . 8
. . . 1 . . . . .
. . . . . . 6 . 7
. . . 2 . 6 . . .
```

Middle-left grid
```
2 . 7 . 4 . 5
. 8 . . 2 . .
. . 2 3 . . .
. 8 . . . 9 .
. 1 . . . 6 .
. . 7 8 4 . .
```

Middle-right grid
```
2 . 4 . 9 . 7
. . 8 . 2 . .
. . 5 . 4 . .
. 6 . . 8 . 1
. 9 . . . 3 .
. . 7 9 6 . .
```

(Lower grids — completed solutions)

Bottom-left region
```
9 7 2 3 5 8 6 4 1
1 3 8 4 7 6 5 2 9
4 6 5 9 2 1 3 8 7
5 2 3 6 4 7 9 1 8
7 9 6 8 1 3 2 5 4
8 1 4 2 9 5 7 6 3
2 8 9 5 3 4 1 7 6
3 4 7 1 6 2 8 9 5
6 5 1 7 8 9 4 3 2
```

Bottom-center region
```
3 6 5 7 8 2 4 1 9
2 8 1 4 9 5 7 6 3
7 9 4 1 3 6 2 5 8
4 1 9 5 7 3 6 8 2
8 5 7 2 6 9 1 3 4
6 3 2 8 4 1 5 9 7
9 2 3 6 5 7 8 4 1
1 4 6 9 2 8 3 7 5
5 7 8 3 1 4 9 2 6
```

Bottom-right region
```
5 3 6 7 4 8 2 9 1
7 4 8 9 2 1 5 3 6
1 2 9 6 5 3 4 7 8
2 8 7 4 6 9 1 5 3
9 1 3 5 8 2 7 6 4
6 5 4 3 1 7 9 8 2
3 6 5 1 7 4 8 2 9
4 9 2 8 3 5 6 1 7
8 7 1 2 9 6 3 4 5
```

Lower-center region
```
2 6 7 8 1 9 4 3 5
3 4 8 5 6 7 2 1 9
9 5 1 2 4 3 6 8 7
5 8 3 6 2 1 7 9 4
7 1 4 9 3 5 8 6 2
6 2 9 7 8 4 3 5 1
```

Lower-right region
```
2 1 4 6 3 8 9 5 7
6 5 8 9 1 7 2 4 3
7 3 9 5 2 4 1 8 6
5 6 2 4 8 3 7 1 9
4 9 7 1 5 2 6 3 8
1 8 3 7 9 6 5 2 4
```

Round 11: The Lucky Number 8

Oct 15th, 11:30 – 12:05, 35 Minutes

8 Variant Sudoku

Total Points: 230

1. Classic 8 Sudoku:
Fill in the grid so that every row, column, and 2×4 box contains the digits 1 through 8.

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

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

2. Answer 8 Sudoku:
Fill in the grid so that every row, column, and 3×3 box contains the digits 1 through 9. Black dots connecting adjacent cells imply that applying one of the binary operations (addition, subtraction, multiplication, or division) on the two digits result in number 8. Adjacent cells not connected by black dots imply that 8 cannot be produced by the two digits with any binary operations.

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

3. Distance to 8 Sudoku:
Fill in the grid so that every row, column, and 3×3 box contains the digits 1 through 9. The nine grey cells can be paired up with the nine cells with digit 8. In each pair, the digit in the grey cell represents its horizontal, vertical, or diagonal distance to the cell with digit 8.

Puzzle grid (given clues):

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

Solution grid:

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

4. Little Killer Sudoku:
Fill in the grid so that every row, column and 3×3 box contains the digits 1 through 9. Numbers with arrows indicate the sum of the numbers along the diagonal in that direction. Digits can repeat along diagonals.

Top clues (left to right): 3, 16, 12, 23, 32, 25, 28, 34
Left clues (top to bottom): 54, 42, 36, 16, 23, 20, 4, 2
Right clues (top to bottom): 9, 12, 9, 16, 20, 33, 43, 34
Bottom clues (left to right): 50, 27, 33, 26, 21, 13, 10, 7

Puzzle grid (given clues):

		4			2			
			2					
		7			5			

Solution grid:

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

5. Big Neighbor Sudoku: Fill in the grid so that every row, column, and 3×3 box contains the digits 1 through 9. For each cell labeled with a diamond, digits in its corners represent all digits in the four adjacent (top, bottom, left, and right) cells that are larger than the digit in the focal cell.

Puzzle grid (left) and solution (right):

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

6. With 8 Sudoku: Fill in the grid so that every row, column, and 3×3 box contains the digits 1 through 9. Each black dot shows that there is one and only one digit 8 among the four cells surrounding it.

Puzzle grid (left) and solution (right):

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

7. 8 by 4 Sudoku: Fill in the grid so that every row, column, and 4×2 region defined by the thick lines contains the digits 1 through 4, with each digit appearing twice. Digits cannot repeat in adjacent cells.

Puzzle:

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

Solution:

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

8. 4 by 2 Sudoku: Fill in the grid so that every row, column, and 3×3 box contains the digits 1 through 9. Each grey region can only contain 4 different digits, with each digit appearing twice.

Puzzle:

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

Solution:

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