



**Kraków**  
**SUDOKU  
& PUZZLE**  
WORLD CHAMPIONSHIPS  
2022



# SUDOKU



**SFINKS**  
Fundacja Rozwoju  
Matematyki Rekreacyjnej

# INSTRUCTION BOOKLET

## World Sudoku Championship 2022 Kraków, Poland

### Monday, 17th October

<b>09:00 – 09:25</b> Round 1 Individual: Classics	<b>25 min</b>	<b>270 points</b>
<b>09:45 – 10:15</b> Round 2 Individual: Nonclassics	<b>30 min</b>	<b>300 points</b>
<b>10:30 – 11:15</b> Round 3 Individual: Sudoku with Digits	<b>45 min</b>	<b>450 points</b>
<b>11:30 – 12:10</b> Round 4 Individual: Sudoku without Digits	<b>40 min</b>	<b>400 points</b>
<b>12:30 – 13:00</b> Round 5 Individual: Samurai	<b>30 min</b>	<b>350 points</b>
<b>15:00 – 15:30</b> Round 6 Individual: Truthful Sudokus	<b>30 min</b>	<b>300 points</b>
<b>15:45 – 16:30</b> Round 7 Individual: Liar Sudokus	<b>40 min</b>	<b>400 points</b>
<b>17:00 – 17:30</b> Round 8 Team: 26 Letters	<b>30 min</b>	<b>1600 points</b>
<b>17:45 – 18:45</b> Round 9 Team: 3D Sudoku	<b>60 min</b>	<b>2800 points</b>

### Tuesday, 18th October

<b>09:00 – 09:40</b> Round 10 Individual: Simple Math	<b>40 min</b>	<b>400 points</b>
<b>10:00 – 10:45</b> Round 11 Individual: Advanced Math	<b>45 min</b>	<b>450 points</b>
<b>11:00 – 11:30</b> Round 12 Individual: Aftermath	<b>30 min</b>	<b>300 points</b>
<b>12:00 – 13:12</b> Round 13 Team: Tournament	<b>72 min</b>	<b>4400 points</b>
<b>15:00 – 16:30</b> Round 14 Individual: Wild Card		
<b>16:45 – 18:30</b> Round 15 Individual Play-off		

# Competition Rules

## Scoring and Bonuses

Points will be awarded only for fully and correctly solved puzzles. In general, there is no partial credit unless stated otherwise in the round's description.

## Individual Rounds

A bonus of 10 points for each full remaining minute will be awarded to any competitor who correctly solves all puzzles in a round. A partial 60% bonus can be awarded if one puzzle is incorrectly solved, under the condition that the puzzle is solved completely or almost completely and the competitor may have believed their solution to be correct. In case of doubt, the decision will be made in favour of the competitor; the decision of the judges is final.

## Team Rounds

A bonus of ? points for each full remaining minute will be awarded to any team who correctly solves all the puzzles in a round. If there are any mistakes, then no bonus will be awarded.

## Competition Hall Rules

1. All competitors have to sit at their pre-allocated desk in individual rounds. Teams have to work at their pre-allocated desk area for team rounds.
2. Prior to the start of each round, competitors must ensure they are at their desks ready for the start of the round. Late arrivals may not be permitted to enter the competition hall to take part in a round (at the discretion of the organizers).
3. Prior to the start of each round, competitors have to clearly write their name, team and country on the front page of their competition booklet into the allocated space. If this information is not complete, then the organizers reserve the right not to award any points to that competitor for that round. Competitors must not open their booklets before the official start of the round.
4. When the signal for the start of the round has been given, competitors may open their booklets and begin solving the puzzles.
5. During each individual round, competitors have to keep silent, unless declaring completion of a round.
6. During team rounds, team members may talk to each other, but should do this with respect to other teams.
7. To declare a round complete, a competitor must close their booklet, clearly state "finished" and raise their arm with the booklet. The competitor's arm must be raised until the booklet is collected. The same rules apply for the team competition.
8. Competitors or teams who complete a round with more than five minutes in advance, are allowed to leave the competition hall quietly.
9. Competitors or teams who complete a round with five minutes or less left are not allowed to leave their desks or tables in order to cause no unnecessary disruption to fellow competitors.

# Competition Rules

10. When a competitor leaves the competition hall for any reason, they may not be allowed to continue in that round (at the discretion of the organizers).
11. When the signal is given that the round is finished, competitors have to stop solving immediately, close their booklets, put their pens or pencils down and their hands up with their booklets for collecting.
12. At the end of a round, competitors have to remain seated until all booklets have been collected. The signal to get up and leave will be given by the supervisor.
13. Mobile phones and electronic devices are not permitted to use in the competition hall. The devices have to be turned off and must not be placed on the competitor's desk.
14. Only team captains and official observers equipped with a name tag are allowed to enter the competition hall while either individual or team rounds are taking place. Other non-competing participants may enter the competition hall at the discretion of the organizers.
15. Competitors may not use cameras or other recording devices during rounds. Only official observers may do so, at the discretion of the organizers. They have to respect the competitors and not use flash photography or cameras with excessive sounds.
16. When a competitor believes that there is a problem with a puzzle, they must clearly state that puzzle is wrong by writing "Wrong puzzle" next to it. The competitor must not notify the organizers during the round. This will be investigated upon completion of the round.
17. Puzzles can be completed in any order within a round. The points' value of a puzzle is an indication of its expected difficulty, although individual solving experience may differ. The difficulty of an example puzzle does not necessarily reflect the difficulty of the corresponding competition puzzle.

## Permitted items

18. Permitted items which can be used in the competition hall (unless stated otherwise) are: pens, pencils, pencil sharpeners, erasers, rulers, blank papers and instruction booklets annotated with notes regarding puzzle instructions and preparation notes.
19. Drinks and snacks are permitted as long as they do not disturb other competitors with a strong smell or rustling packet.
20. It is strictly forbidden to use electronic devices such as music players and headphones or any type of calculator. Use of such equipment may lead to the disqualification of the competitor.
21. Any other items brought into the hall must be kept in a bag on the floor and placed under the competitor's desk, so as not to block the aisles.

# Competition Rules

## Marking and Queries

22. When a round has been evaluated, fully marked booklets are returned to a team member equipped with a country tag at a given location in a given time. Country tags will be distributed to each captain prior the start of the championships.

23. In case of any query after a booklet has been evaluated and returned to a competitor, the query must be raised through a team member with country tag to the organizers in the specified time. The schedule for the queries will be published before the competition. The booklet should be left with the organizers for investigation.

24. Puzzles may be photographed during the marking phase in order to prevent subsequent interventions.

25. Team captains are responsible for ensuring that any information given to them related to the competition is effectively relayed to their team.

## Breach of Rules

26. Any breach of these rules may lead to penalty points, or in severe cases to a competitor or team being disqualified from the round or competition.

27. The decision of the WSC tournament director (Łukasz Bożykowski) is final.

## Final Remarks

28. In case of a major mistake in one of the rounds, organizers reserve the right to cancel the round, either by removing it from the time schedule, or by not awarding any points for it to any of the competitors.

29. The official puzzle booklets will contain one or multiple puzzles per page in the individual rounds. The rules of the puzzle and the corresponding points are always written next to it.

30. The official puzzle booklets will not contain puzzle examples. Therefore, we recommend to bring the Instruction Booklet, which contains an example of every puzzle which will be part of the championship.

31. In the team rounds, the official puzzle booklets may contain neither puzzle rules nor examples. It is advised to bring at least one Instruction Booklet for a team for these rounds.

32. In any case of inconsistency between this Instruction Booklet and the official puzzle booklets, e.g. rules or points, the information in the Instruction Booklet will be considered valid.

33. In the competition hall, a timer counting down to the end of the round will be visible for all the competitors.

## Credits

34. All the sample puzzles in this Instruction Booklet were made by organisers. They cannot be commercially used. All rights have been reserved.

35. We would like to thank the organizers of the previous WSC & WPC, we use parts of the Competition Rules from the Instruction Booklets published in the past.

# Competition Rules

36. Puzzles for the WPC were created by the following designers (in the alphabetical order):

- Łukasz Bożykowski
- Michał Stajszczak
- Petr Lichý
- Piotr Gdowski
- Siyuan Luo
- Tomasz Skalski



# Individual competition

Individual competition consists of ten individual regular rounds, Wild Card tournament and Individual Playoffs. The individual ranking after regular rounds is determined by the sum of the scores of all regular rounds. TOP12 competitors from the individual ranking after regular rounds are qualified automatically into Playoffs. All competitors that were outside TOP12, but were the best within their own full A team (after the exclusion of TOP12) are qualified into the Wild Card tournament. Both playoffs and Wild Card tournament will inherit seeding from the individual rounds. The ties are resolved by the following tiebreaker criteria 1) score without time bonuses, 2) score in Round 12, 3) score in Round 11, ..., 11) score in Round 1, 12) random draw.

## Wild Card tournament

The Wild Card tournament will consist of five rounds, where each round consists of solving a single puzzle with a maximum time of 10 minutes, where competitors are paired and duels within each pair take place. The competitors will be given seeds from 1 to 32 according to already explained rules (that is, 1st seed is the highest one). In case where less than 32 competitors are qualified into the Wild Card tournament, competitors with the highest seeds will get a bye. In the first round players will be matched in duel pairs 1-32, 2-31, ..., 16-17 according to their seeds. The winner in each pair takes the seed of the higher seeded competitor in this duel (hence competitors heading into the next round will have seeds from 1 to 16). In the second round competitors will be matched in pairs 1-16, 2-15, ..., 8-9. We continue with this scheme until the winner of the Wild Card is determined.

## Duel rules

The completion of a puzzle has to be notified by flipping the paper and saying "finished". In the case where the competitor who notified the completion first solved the puzzle correctly, they are declared as the winner of the duel. Otherwise, second competitor is declared as the winner of the duel. In case that no competitor solves the puzzle correctly, competitor with better individual ranking becomes the winner.

## Individual Playoff rules

Individual Playoffs will consist of four rounds. In each round four competitors will compete. In the first round players with places 10, 11, 12 and the winner of the Wild Card tournament will compete. In the second round players with places 7, 8, 9 and the winner of the first round will compete. In the third round players with places 4, 5, 6 and the winner of the second round will compete and finally in the fourth round players with places 1, 2, 3 and the winner of the third round will compete. The number of puzzles in first, second, third and fourth rounds will be 3, 3, 4 and 5 and the time limits will be 21, 21, 28 and 35 minutes, respectively. These puzzles will be chosen by play-off competitors from the sets of puzzles revealed by organizers. There will be one common pool of puzzles to choose from for all rounds. All the puzzle types are from individual rounds 1-10. The selection of puzzles for all playoff rounds will take place before the first round of the playoffs. First, the puzzles for the fourth round will be chosen, then the puzzles for the third round, then second and then first. Players choose puzzles in order determined by places taken after individual rounds. For the fourth round the order is 1-2-3-1-2, for the third round it is 4-5-6-4, for the second one it is 7-8-9 and for the first one it is 10-11-12.

# Individual competition

## Solving, Submission, Grading and Ranking

When a play-off competitor completes a puzzle, they must raise their hand to indicate to a judge to enter the submission period. The entire puzzle will then be checked over the next minute. After one minute, if the puzzle is correct, the judge will allow the competitor to begin the next puzzle. If the puzzle is incorrect, the judge will return the incorrect puzzle to the competitor. The competitor can resubmit a returned puzzle at any time, and will again enter the submission period. The first, second and third round of the play-off stops either with the end of the time limit, or when the first competitor solves correctly all puzzles in the round, whichever is earlier. The fourth round of the play-off stops either with the end of the time limit, or when 3 competitors correctly solve all puzzles in the round, whichever is earlier. The rank for a playoff round is determined by a) number of correctly solved puzzles, b) time of the last correct submission, c) seeding. In playoff rounds 1, 2 and 3 we care only about the winner, other players are ranked according to the score in preliminary rounds. In the big finals all positions 1-4 are determined by playoff results.

In an unlikely event of a wrong puzzle being included in one of the playoff rounds, time for each competitor is paused at the moment they solves correctly a puzzle they was solving during the wrong puzzle discovery or when the time limit ends, whichever is earlier. The competitor who chose the wrong puzzle will choose the new one that will replace it from the set of puzzles that were not chosen already. All competitors will continue with time offsets adjusted accordingly.

## Team Competition

There will be three team rounds. Score for each team will be calculated as the sum of scores of its members in individual standard rounds and team scores in team rounds. There will be no team playoffs. In case of any ties the tiebreaking criteria are: 1) sum of scores from team rounds, 2) score without time bonuses, 3) score of the highest scoring team member, 4) score of the second highest scoring team member, 5) score of the third highest scoring team member, 6) random draw.

1.1 Classic Sudoku	30 points
1.2 Classic Sudoku	30 points
1.3 Classic Sudoku	30 points
1.4 Classic Sudoku	30 points
1.5 Classic Sudoku	30 points
1.6 Classic Sudoku	30 points
1.7 Classic Sudoku	30 points
1.8 Classic Sudoku	30 points
1.9 Classic Sudoku	30 points

## 1.1 - 1.9 Classic Sudoku

### Instruction

Place a digit from 1 to 9 (1 to 6 in example) into each of the empty cells so that each digit appears exactly once in each row, column and 3x3 outlined box.

#### Example

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

#### Solution

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





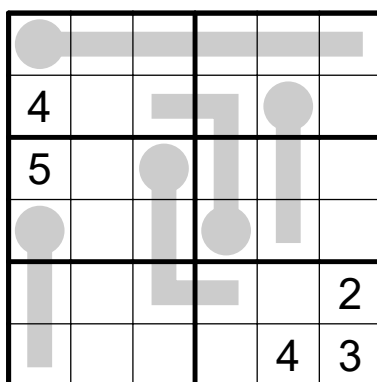
2.1 Thermometer	15 points
2.2 Fortress	10 points
2.3 Where Is 9?	25 points
2.4 Self-joint Sudoku	10 points
2.5 Killer 28	70 points
2.6 Chessudoku	40 points
2.7 Sequence Top-Bot	30 points
2.8 Antidiagonal	20 points
2.9 Antiknight	30 points
2.10 Antidiagonal antiknight	50 points

## 2.1 Thermometer

### Instruction

Classic Sudoku rules apply. Additionally, the digits in each thermometer are placed in increasing order from the bulb to the end.

### Example



### Solution

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

## Round 2: Nonclassic

### 2.2 Fortress

#### Instruction

Classic Sudoku rules apply. Additionally the digit in a grey cell is greater than each digit in an orthogonally adjacent white cell.

#### Example

1	2	3			
4					
5					
					6
					5
			1	2	3

#### Solution

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

### 2.3 Where is 9?

#### Instruction

Classic Sudoku rules apply. Additionally, the numbers in arrows indicate the distance and direction to the cell with 9 (6 in example). All arrows are shown.

#### Example

1	2	3			
4					
5			4		
					6
					5
			1	2	3

#### Solution

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



## Round 2: Nonclassic

### 2.4 Self-joint Sudoku

#### Instruction

Classic Sudoku Rules apply. Additionally, each of the digits describes (correctly or not) the position of its square in the 3x3 square. All correctly described squares are highlighted.

#### Example

			9	7	2			
						4		
						6		
	1					9		
	3							
	4							
		1	3	7				

#### Solution

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

### 2.5 Killer 28

#### Instruction

Classic Sudoku rules apply. The sum of all numbers in a cage must match the small number in the corner of the cage. No number appears more than once in a cage. Additionally, the sum of the number in each cage must be a number from 2 to 28 (from 5 to 16 in example), with each number used exactly once.

#### Example

	2				6
4	12				8
14				1	
	16				1
10					

#### Solution

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



## Round 2: Nonclassic

### 2.6 Chessudoku

#### Instruction

Place a digit from 1 to 8 in each empty cell so that each digit appears exactly once in each row, column and outlined region. Each outlined region is marked by thick borders. Additionally, the top two rows simulate black pieces and bottom two rows simulate white pieces before the start of the game of chess. The digits appearing in place of a piece and identical digits cannot be separated by a move of that chess piece. (This means that pawns in the second and seventh rows cannot touch the same number by side or corner in the third and sixth rows respectively. Similarly, kings in the fifth column cannot touch the same number by side or corner. Queens in the fourth column cannot have the same number on its diagonal, similarly to the bishops in the third and sixth columns. Knights cannot have the same number in knights' move from its original spot.)

#### Example

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

#### Solution

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



## Round 2: Nonclassic

### 2.7 Sequence Top-Bot

#### Instruction

Classic Sudoku rules apply. Additionally, there are two sequences of numbers: from digit 1 in top row to digit 9 in bottom row and from digit 1 in bottom row to digit 9 in top row. A sequence has to have consecutive numbers touching by side or corner.

#### Example

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

#### Solution

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

### 2.8 Antidiagonal

#### Instruction

Classic Sudoku rules apply. Additionally every main diagonal contains only 3 different numbers.

#### Example

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

#### Solution

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



## Round 2: Nonclassic

### 2.9 Antiknight

#### Instruction

Classic Sudoku rules apply. Additionally, no two identical digits can be a chess knight's move away from each other.

#### Example

1	2	3			
4					
5					
					2
				4	3

#### Solution

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

### 2.10 Antidiagonal antiknight

#### Instruction

Classic Sudoku rules apply. Additionally every main diagonal contains only 3 different numbers and no two identical digits can be a chess knight's move away from each other.

#### Example

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

#### Solution

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



3.1 Diagonal	40 points
3.2 Irregular	60 points
3.3 No Touch	15 points
3.4 Disjoint	10 points
3.5 Extra Region	20 points
3.6 Quad Max	50 points
3.7 Skyscrapers	50 points
3.8 Little killer	90 points
3.9 Windoku	25 points
3.10 Arrows	40 points
3.11 Clone	50 points

## 3.1 Diagonal

### Instruction

Classic Sudoku rules apply. Additionally, numbers cannot be repeated on both marked diagonals.

#### Example

1	2	3			
4					
5					
					3

#### Solution

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



## Round 3: Sudoku with digits

### 3.2 Irregular

#### Instruction

Place a digit from 1 to 9 in each empty cell so that each digit appears exactly once in each row, column and outlined region. Each outlined region is marked by thick borders.

#### Example

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

#### Solution

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

### 3.3 No Touch

#### Instruction

Classic Sudoku rules apply. Additionally, no same numbers can touch each other diagonally.

#### Example

1	2	3			
4					
5					
					1
				2	4

#### Solution

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





## Round 3: Sudoku with digits

### 3.4 Disjoint

#### Instruction

Classic sudoku rules apply. Additionally, cells with the same position in 3x3 boxes contain all numbers from 1 to 9 i.e. no number can repeat in the same position in 3x3 boxes.

#### Example

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

#### Solution

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

### 3.5 Extra Region

#### Instruction

Classic sudoku rules apply. Additionally, each group of nine (six in example) grey cells must also contain all numbers from 1 to 9 (1 to 6 in example).

#### Example

1	3	5			
6					
2					
3					4
	1			3	2

#### Solution

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



## Round 3: Sudoku with digits

### 3.6 Quad Max

#### Instruction

Classic Sudoku rules apply. The arrow in each 2×2 region points to the largest digit within the region. The largest digit can only appear once in this region.

#### Example

		5	2		
		6	1		
2					1
	4			5	

#### Solution

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

### 3.7 Skyscrapers

#### Instruction

Classic sudoku rules apply. Additionally, the number of visible skyscrapers, as viewed from the direction of each clue, is equal to the value of the clue. Note that higher skyscrapers block the view of lower skyscrapers located behind them.

#### Example

						2
						3
						4
6	4	5				

#### Solution

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



## Round 3: Sudoku with digits

### 3.8 Little killer

#### Instruction

Classic Sudoku Rules apply. Additionally, numbers with arrows indicate the sum of the numbers in that direction.

#### Example


Arrows and sums for Example:

- Top row: 1 (down), 5 (down), 11 (down), 16 (down), 21 (down)
- Bottom row: 22 (up), 13 (up), 6 (up), 5 (up), 5 (up)

#### Solution

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

Arrows and sums for Solution:

- Top row: 1 (down), 5 (down), 11 (down), 16 (down), 21 (down)
- Bottom row: 22 (up), 13 (up), 6 (up), 5 (up), 5 (up)

### 3.9 Windoku

#### Instruction

Classic Sudoku Rules apply. Additionally, each of the four shaded 3x3 boxes must also contain all numbers from 1 to 9.

#### Example

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

#### Solution

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



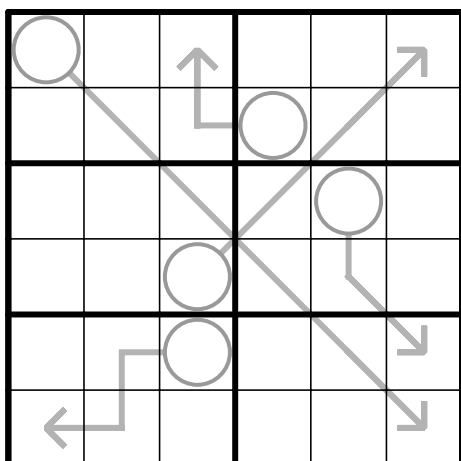
## Round 3: Sudoku with digits

### 3.10 Arrow

#### Instruction

Classic Sudoku rules apply. The number in a circle is equal to the sum of the numbers placed on the arrow.

#### Example



#### Solution

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

### 3.11 Clone

#### Instruction

Classic Sudoku Rules apply. Additionally, in grey areas with the same shape, all digits on equal places must be identical.

#### Example

1	2	3			
4					
5			4		
					6
					5
			1	2	3

#### Solution

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



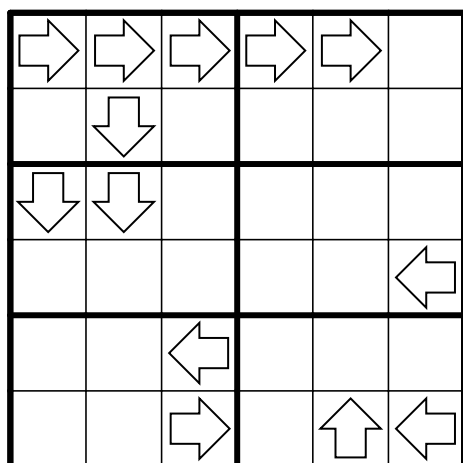
4.1 Where is X?	40 points
4.2 Clockfaces start no rotations	60 points
4.3 Arrows	80 points
4.4 Greater than	40 points
4.5 Irregular Kropki	30 points
4.6 Polish Cross	60 points
4.7 Odd/Even Rossini	50 points
4.8 Consecutive Sequence	40 points

## 4.1 Where is X?

### Instruction

Classic Sudoku rules apply. Additionally, the numbers in arrows indicate the distance and direction to the cell with X. All arrows are shown. X is not given.

### Example



### Solution

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



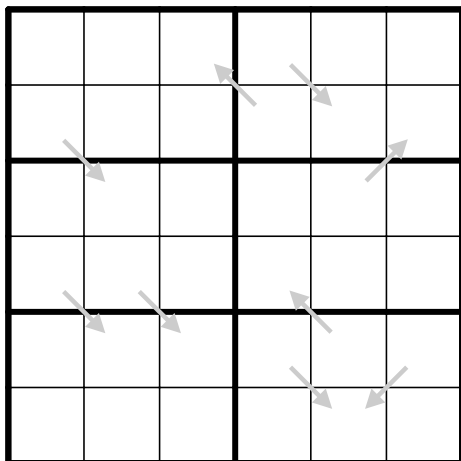
## Round 4: Sudoku without digits

### 4.2 Clockfaces start no rotations

#### Instruction

Classic Sudoku rules apply. Four digits around the grey arrow are strictly increasing, but it is unknown whether they increase clockwise or anti-clockwise. The gray arrow points the lowest of the four numbers. All possible arrows are given.

#### Example



#### Solution

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

### 4.3 Arrows

#### Instruction

Classic Sudoku rules apply. The number in a circle is equal to the sum of the numbers placed on the arrow.

[Check Example → 3.10](#)



## Round 4: Sudoku without digits

### 4.4 Greater than

#### Instruction

Classic Sudoku rules apply. Additionally, digits have to be placed in accordance with the “greater than” signs.

#### Example

>	>		<	<	
^	^	v	^	v	v
>	>		>	>	
<	>		>	<	
v	v	v	^	^	v
>	<		<	>	
<	<		>	<	
^	v	v	^	^	v
>	<		>	>	

#### Solution

4	>	3	>	2		1	<	5	<	6	
^		^		v		^		v		v	
6	>	5	>	1		4	>	3	>	2	
3	<	6	>	5		2	>	1	<	4	
v		v		v		^		^		v	
2	>	1	<	4		5	<	6	>	3	
1	<	4	<	6		3	>	2	<	5	
^		v		v		^		^		v	
5	>	2	<	3		6	>	4	>	1	

### 4.5 Irregular Kropki

#### Instruction

Irregular Sudoku rules apply. A white dot between two adjacent cells requires that the value in one cell is exactly 1 greater than the value of the other cell (e.g. 3 & 4). A black dot between two adjacent cells requires that the value in one cell is exactly double the value of the other cell (e.g. 3 & 6). If there is no dot between two cells then none of the two conditions must be fulfilled.

#### Example


#### Solution

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



## Round 4: Sudoku without digits

### 4.6 Polish Cross

#### Instruction

Classic Sudoku rules apply. Every digit is substituted as one part of that Polish cross as seen in the diagram (1 top left, 9 bottom right). There are edges assigned to each digit. Some squares contain lines, which indicate which digits are not allowed in the square. The lines in each sudoku square must be a subset of the edges assigned by the diagram to the corresponding digit. As an example, a line on the right and top of the square will indicate that digits 1, 2, 3, 6 and 9 are not allowed in that square.

1	2	3
4	5	6
7	8	9

#### Example


#### Solution

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





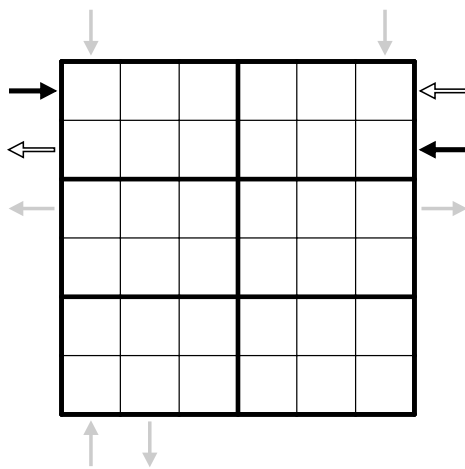
## Round 4: Sudoku without digits

### 4.7 Odd/Even Rossini

#### Instruction

Classic Sudoku rules apply. The arrows outside the grid indicate whether the nearest three digits in the corresponding direction are in ascending or descending order (the highest number is always in the direction of the arrow). All possible arrows are given, so if there is no arrow, the first three digits do not form an increasing sequence in either direction. If the arrow is black, all 3 numbers are even. If the arrow is white, all 3 numbers are odd. If the arrow is grey, it contains both even and odd numbers.

#### Example



#### Solution

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



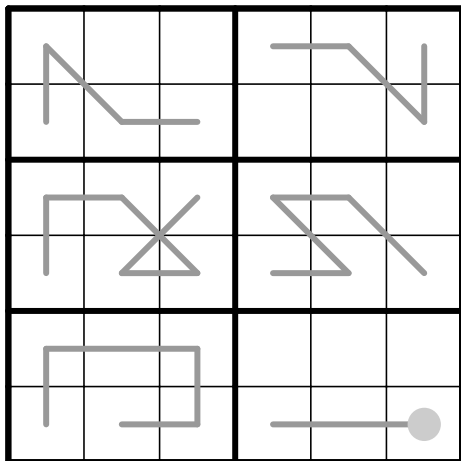
## Round 4: Sudoku without digits

### 4.8 Consecutive Sequence

#### Instruction

Classic Sudoku rules apply. If the two neighbouring cells are connected with a grey line, they contain consecutive digits. All possible sequences inside boxes with length of at least three are marked. Additionally, if the sequence has a dot at the end, the dot indicates the lower end of the sequence.

#### Example



#### Solution

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



## 5.1 Samurai .....14 \* 25 points

Points will be given for each correctly solved 9x9 diagram. Points for solving a puzzle is given only if it is a part of final solution.

## 5.1 Samurai

## Instruction

Classic Sudoku rules apply. The Samurai contains 14 classic diagrams (2 in example). Additionally, if there is a dotted line between two cells, numbers in both cells are equal.

## Example

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

## Solution

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



6.1 - 6.3 Classic	3 * 15 points
6.4 Frame Sum	40 points
6.5 Kropki	25 points
6.6 Irregular	25 points
6.7 Consecutive	60 points
6.8 Pencilmark	15 points
6.9 Point To Next	60 points
6.10 Greater Than	30 points

## 6.1 - 6.3 Classic

### Instruction

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

[Check Example → 1.1](#)

## 6.4 Frame Sum

### Instruction

Classic Sudoku rules apply. Additionally, the numbers outside the grid are equal to the sum of the digits appearing in the cells in the first box (till the next bold line) seen from that edge of the grid.

#### Example

	7		6	6		7
14						
11						
12						
	6					
	11		5	9		7

#### Solution

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



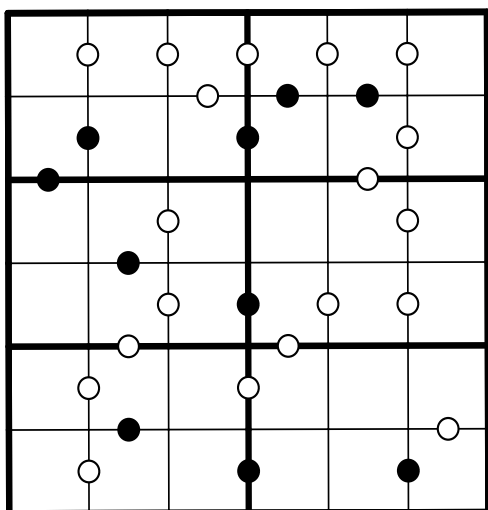
## Round 6: Truthful Sudokus

### 6.5 Kropki

#### Instruction

Classic Sudoku rules apply. A white dot between two adjacent cells requires that the value in one cell is exactly 1 greater than the value of the other cell (e.g. 3 & 4). A black dot between two adjacent cells requires that the value in one cell is exactly double the value of the other cell (e.g. 3 & 6). If there is no dot between two cells then none of the two conditions must be fulfilled.

#### Example



#### Solution

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

### 6.6 Irregular

#### Instruction

Place a digit from 1 to 9 in each empty cell so that each digit appears exactly once in each row, column and outlined region. Each outlined region is marked by thick borders.

[Check Example → 3.2](#)



## Round 6: Truthful Sudokus

### 6.7 Consecutive

#### Instruction

Classic Sudoku rules apply. The dots between two cells indicate that the difference of the two digits in these cells is 1. All possible dots are given.

#### Example

3					

#### Solution

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

### 6.8 Pencilmark

#### Instruction

Classic Sudoku rules apply. If there are pencilmarks in the cell, the digit in this cell must be chosen from given pencilmarks.

#### Example

345		45		23	34
	123		56		23
23		456		45	
	45	123	234		56
45	1234	34		123	
56	12		23		345

#### Solution

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



## Round 6: Truthful Sudokus

### 6.9 Point To Next

#### Instruction

Classic Sudoku rules apply. If the digit in the marked cell is N, the digit N+1 must appear in the direction that the arrow mark pointed.

#### Example

↓		←	→	←	4
	↓	↓	↓		↑
↑	↓		↑	↑	↓
↑	↑	↑	↓		
↓		←		→	←
6	→	→		→	←

#### Solution

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

### 6.10 Greater than

#### Instruction

Classic Sudoku rules apply. Additionally, digits have to be placed in accordance with the "greater than" signs.

[Check Example → 4.4](#)



7.1 Liar Classic (8 Squared) .....	50 points
7.2 Liar Classic (Wrong Digit) .....	40 points
7.3 Liar Classic (Corner) .....	50 points
7.4 Liar Frame Sum .....	50 points
7.5 Liar Kropki .....	40 points
7.6 Liar Irregular .....	10 points
7.7 Liar Consecutive .....	30 points
7.8 Liar pencilmark .....	50 points
7.9 Liar point to next .....	40 points
7.10 Liar Greater Than .....	40 points

## 7.1 Liar Classic (8 Squared)

### Instruction

Place a digit from 1 to 9 into each of the empty cells so that each digit appears exactly once in each row and each column. Additionally, each 3x3 outlined box contains 8 different digits

#### Example

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

#### Solution

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





## Round 7: Liar Sudokus

### 7.2 Liar Classic (Wrong Digit)

#### Instruction

Classic Sudoku rules apply. Additionally, one of the given digits is wrong.

#### Example

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

#### Solution

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

### 7.3 Liar Classic (Corner)

#### Instruction

Classic Sudoku rules apply. Each digit in the intersection of two lines has to be placed in at least one of the four adjacent cells.

#### Example

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

#### Solution

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



## Round 7: Liar Sudokus

### 7.4 Liar Frame Sum

#### Instruction

Classic Sudoku rules apply. Additionally, the numbers outside the grid are equal to the sum of the digits appearing in the cells in the first box (till the next bold line) seen from that edge of the grid except for one number in the outside frame that is equal to the product the digits appearing in the cells in the first box (till the next bold line) seen from that edge of the grid.

#### Example

						8	6	6	8
7									
11									
20									
12									
									5
						5	5	9	5

#### Solution

						8	6	6	8
7	3	6	5	1	2	4			
11	4	2	1	5	6	3			
20	2	3	6	4	5	1			
12	1	5	4	2	3	6			
	5	4	3	6	1	2			
	6	1	2	3	4	5			
						5	5	9	5



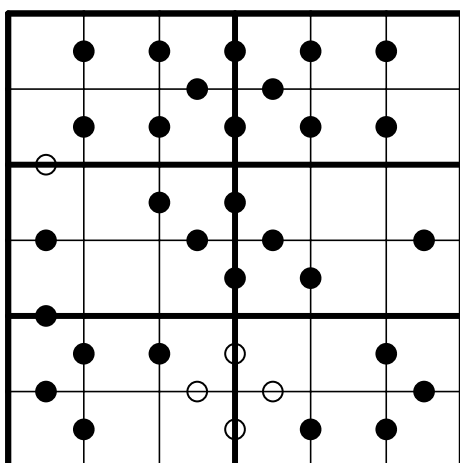
## Round 7: Liar Sudokus

### 7.5 Liar Kropki

#### Instruction

Find a set of 9 different positive integer numbers and place a number from that set into each of the empty cells so that each number appears exactly once in each row, column and 3x3 outlined box. A white dot between two adjacent cells requires that the value in one cell is exactly 1 greater than the value of the other cell (e.g. 3 & 4). A black dot between two adjacent cells requires that the value in one cell is exactly double the value of the other cell (e.g. 3 & 6). If there is no dot between two cells then none of the two conditions must be fulfilled.

#### Example



#### Solution

32	16	8	4	2	1
1	2	4	8	16	32
2	8	16	32	1	4
4	1	32	16	8	2
8	4	2	1	32	16
16	32	1	2	4	8

### 7.6 Liar Irregular

#### Instruction

Place a digit from 1 to 9 in each empty cell so that each digit appears exactly once in each row, column and outlined region. Each outlined region is marked by thick borders. All given digits are incorrect.

#### Example

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

#### Solution

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



## Round 7: Liar Sudokus

### 7.7 Liar Consecutive

#### Instruction

Classic Sudoku rules apply. The dots between two cells indicate that the difference of the two digits in these cells is 1. All possible dots are given. However, exactly one dot indicates that the difference of the two digits in those cells is 2.

#### Example

6					

#### Solution

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

### 7.8 Liar Pencilmark

#### Instruction

Classic Sudoku rules apply. If there are pencilmarks in the cell, the digit in this cell must be chosen from given pencilmark. However, the digit in exactly one cell must not be chosen from given pencilmark.

#### Example

12	12	12	456	456	456
			16	25	34
36	56	14	25	36	14
				35	
12	34	56	135	135	135
12	34	56	246	246	246

#### Solution

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



## Round 7: Liar Sudokus

### 7.9 Liar point to next

#### Instruction

Classic Sudoku rules apply. If the digit in the marked cell is N, the digit N+1 must appeared in the direction that the arrow mark pointed. However, exactly one arrow mark should be deleted, or the puzzle has no solution.

#### Example

→	←	←	←	←	←
↓		←	↓	↓	
↓	↑	→			
↓	↓			→	
↓					
↑				→	

#### Solution

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

### 7.10 Liar Greater than

#### Instruction

Classic Sudoku rules apply. Additionally, digits have to be place in accordance with the "greater than" signs. However, exactly one "greater than" sign is incorrect.

#### Example

^	>	>	^	<	<
^	^	v	^	v	v
^	>	>	^	>	>
v	<	>	^	>	<
v	^	v	^	^	v
^	>	<	^	<	>
^	<	<	^	>	<
^	v	v	^	^	v
^	>	<	^	>	>

#### Solution

4	>	3	>	2	1
^	^	v	^	v	v
6	>	5	>	1	4
3	<	6	>	5	2
v	^	v	^	^	v
2	>	1	<	4	5
1	<	4	<	6	3
^	v	v	^	^	v
5	>	2	<	3	6
^	^	v	^	^	v



8.1-8.4 Arrows. ....	4 * 100 points
8.5-8.8 Diagonal .....	4 * 100 points
8.9-8.12 Classic. ....	4 * 100 points
8.13-8.16 Consecutive .....	4 * 100 points

## Coded

Replace each letter with a number so the same letters (in all diagrams) are replaced by the same number.

### 8.1-8.4 Arrows

#### Instruction

Classic Sudoku rules apply. The number in a circle is equal to the sum of the numbers placed on the arrow.

[Check Example → 4.3](#)

### 8.5-8.8 Diagonal

#### Instruction

Classic Sudoku rules apply. Numbers cannot be repeated on the diagonals.

[Check Example → 3.1](#)

### 8.9-8.12 Classic

#### Instruction

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

[Check Example → 1.1](#)

### 8.13-8.16 Consecutive

#### Instruction

Classic Sudoku rules apply. The dots between two cells indicate that the difference of the two digits in these cells is 1. All possible dots are given.

[Check Example → 6.7](#)



Example

A	3	4	B
2		E	1
4		F	3
C	2	1	D

A	C		F
			C
B			
E			D

Solution

A1	3	4	B2
2	4	E3	1
4	1	F2	3
C3	2	1	D4

A1	C3	4	F2
4	2	1	C3
B2	4	3	1
E3	1	2	D4



9.1 3D Sudoku ..... 12 \* 200 + 2 \* 200 points

## 3D Sudoku

Create two cubes in which each face is a single classic sudoku diagram. If two cells share a cube edge, they should contain the same digit. Points will be given for each correctly solved 9x9 diagram and for each created cube. Points for solving a puzzle are given only if it is a part of final solution.

### Example

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

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

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

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

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

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





## Solution

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

## 9.1 Classic

### Instruction

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



10.1 Odd-Even-Big-Small	20 points
10.2 Suldolku	10 points
10.3 Killer	60 points
10.4 Sudokuro	70 points
10.5 XV	25 points
10.6 X-Sum	70 points
10.7 1234+567+89	70 points
10.8 Frame Product	25 points
10.9 Prime	25 points
10.10 Prime Product	25 points

## 10.1 Odd-Even-Big-Small

### Instruction

Classic 8x8 Sudoku rules apply. Additionally, the indicator word on the outside says that the first two numbers along that row or column are either odd, even, big (5-8) or small (1-4).

### Example

	Small	Even		Big		Small	Odd	Even	
	1							6	Big
Small									
			8			7			Small
Small				7	3				Big
Big				8	1				Small
Odd			1			4			Big
Big									Small
Even	6							7	
		Big		Odd	Small		Even	Small	Odd

### Solution

	Small	Even		Big		Small	Odd	Even	
	1	8	2	5	4	3	7	6	Big
Small	3	4	7	6	8	1	5	2	
	2	5	8	3	6	7	1	4	Small
Small	4	1	6	7	3	2	8	5	Big
Big	7	6	4	8	1	5	2	3	Small
Odd	5	3	1	2	7	4	6	8	Big
Big	8	7	5	4	2	6	3	1	Small
Even	6	2	3	1	5	8	4	7	
		Big		Odd	Small		Even	Small	Odd



## Round 10: Simple Math

### 10.2 Suldolku

#### Instruction

Classic Sudoku rules apply. Additionally, all of the L-tromino formed by even numbers are marked.

#### Example

1					
	3				
		2			
			6		
				5	
4					3

#### Solution

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

### 10.3 Killer

#### Instruction

Classic Sudoku rules apply. The sum of all numbers in a cage must match the small number in the corner of the cage. No number appears more than once in a cage.

#### Example

5 1	15	3			
	5			5	
5		5	15		
5			5		
15					5
	15		3		2

#### Solution

5 1	15 2	3	4	5	6
4	5	6	1	2	3
5 2	3	5 1	15 5	6	4
5 5	6	4	5 2	3	1
15 3	4	2	6	1	5 5
6	15 1	5	3	4	2



## Round 10: Simple Math

### 10.4 Sudokuro

#### Instruction

Irregular Sudoku rules apply. Additionally, the sum of each horizontal block equals the clue on its left, and the sum of each vertical block equals the clue on its top.

#### Example

	4	10		8	
3					
			10		
10					6
		10			
9					
			6		

#### Solution

	4	10		8	
3	1	2		3	4
	3	4	2	1	
10			1	3	4
		10	6		2
9	2	3	4		1
	4		1	2	3

### 10.5 XV

#### Instruction

Classic sudoku rules apply. Additionally, if an X is given between two adjacent cells, the digits in those cells sum to 10. If a V is given between two adjacent cells, the digits in those cells sum to 5. If an X or V is not given, the two digits cannot sum to 5 or 10.

#### Example

		V	3		
V				V	
	V				X
		X		V	
			X		
	V			V	
X					2

#### Solution

1	2	V	3	4	5	6
V	4	5	6	V	1	2
2	V	3	1	5	6	X
5	6	X	4	2	V	3
3	1	2	6	X	4	5
6	X	4	5	3	V	1
						2



## Round 10: Simple Math

### 10.6 X-Sum

#### Instruction

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

#### Example

							7	10	12	20	21	
												21
16												6
5												16
20												
6												18
21												3
							21	14	18	11		7

#### Solution

							7	10	12	20	21	
	1	2	3	4	5	6						21
16	4	5	6	1	2	3						6
5	2	3	1	5	6	4						16
20	5	6	4	2	3	1						
6	3	1	2	6	4	5						18
21	6	4	5	3	1	2						3
							21	14	18	11		7

### 10.7 1234+567+89

#### Instruction

Classic Sudoku rules apply. Additionally, for the indicated rows, the sum of the 4-digit number, the 3-digit number, and the 2-digit number will be equal to the given total.

#### Example

9			+		+	3	=9513
	8		+		+	4	=8442
		4	+		5	+	=4068
			7	+	6	+	=1710
			+	9		+	=7452
			3	+	8	+	=6480
		3	+		8	+	=5445
	7		+		+	3	=9396
2			+		+	4	=2979

#### Solution

9	2	5	4	+	1	7	6	+	8	3	=9513
7	8	6	9	+	5	3	2	+	4	1	=8442
3	1	4	6	+	8	2	5	+	9	7	=4068
1	3	8	7	+	2	6	4	+	5	9	=1710
6	4	2	1	+	9	5	3	+	7	8	=7452
5	9	7	3	+	4	8	1	+	2	6	=6480
4	6	3	5	+	7	9	8	+	1	2	=5445
8	7	1	2	+	6	4	9	+	3	5	=9396
2	5	9	8	+	3	1	7	+	6	4	=2979



## Round 10: Simple Math

## 10.8 Frame Product

## Instruction

Classic Sudoku rules apply. Numbers outside the diagram are equal to the product of first 3 numbers in the corresponding direction.

## Example

	72	90	10	8	15	48	
24							30
30							24
90				2			8
8				5			90
24							30
30							24
	10	8	72	90	48	15	

## Solution

	72	90	10	8	15	48	
24	4	3	2	1	5	6	30
30	6	5	1	4	3	2	24
90	3	6	5	2	1	4	8
8	2	1	4	5	6	3	90
24	1	4	6	3	2	5	30
30	5	2	3	6	4	1	24
	10	8	72	90	48	15	

## 10.9 Prime Sudoku

## Instruction

Classic Sudoku rules apply. Additionally, the highlighted cells can only contain a prime number.

## Example

1					
	2				
		3			
			4		
				5	
					6

## Solution

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

## Round 10: Simple Math

### 10.10 Prime Product

#### Instruction

Classic Sudoku Rules apply. Additionally, each dot indicates that the product of the two adjacent digits is a prime number.

#### Example

	○		3		
				6	○
		○	4		3
4		5		○	
	6				
○		4			○

#### Solution

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



11.1 TomTom	75 points
11.2 Renban	20 points
11.3 Full Rank	40 points
11.4 Written Multiplication Sudoku	20 points
11.5 Number 5 Still Alive	50 points
11.6 Squares in squares	40 points
11.7 Sudoku Squares	50 points
11.8 X-Roman	60 points
11.9 Sudoku Fractions	50 points
11.10 Determinant Sudoku	25 points
11.11 Integral Sudoku	20 points

## 11.1 TomTom

### Instruction

Classic Sudoku rules apply. Digits at the left-top of the cage indicates the result of numbers in the cage based on the operational symbol. Substraction and division starts with the largest number. Digits may repeat in each cage. Symbol might be missing.

#### Example

5+ 1	5+ 3				
	5 5			5+ 5	
5+ 2		4/ 4	20x 5		
5 5			5 5		
5+ 3					5 5
	5+ 5		3		2

#### Solution

5+ 1	15+ 2	3	4	5	6
4	5 5	6	1	5+ 2	3
5+ 2	3	4/ 1	20x 5	6	4
5 5	6	4	5+ 2	3	1
5+ 3	4	2	6	1	5 5
6	5+ 1	5	3	4	2





## Round 11: Advanced Math

### 11.2 Renban

#### Instruction

Classic Sudoku Rules apply. Additionally marked extra regions contain consecutive digits, not necessarily in sequential order.

#### Example

4	2				
1	3				
		3			
			6		
				3	6
				2	5

#### Solution

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

### 11.3 Full Rank

#### Instruction

Classic Sudoku rules apply. From left to right, right to left, top to bottom and bottom to top you can read 36 9-digit (24 6-digit in example) numbers in the solved Sudoku. A clue gives the position of the 9-digit number starting from there in a list which is created by ordering these 36 numbers starting with the smallest.

#### Example

	3	8	11	13	18	21	
1							24
15							10
6							16
20							2
9							19
23							5
	22	14	17	12	4	7	

#### Solution

	3	8	11	13	18	21	
1	1	2	3	4	5	6	24
15	4	5	6	1	2	3	10
6	2	3	1	5	6	4	16
20	5	6	4	2	3	1	2
9	3	1	2	6	4	5	19
23	6	4	5	3	1	2	5
	22	14	17	12	4	7	



## Round 11: Advanced Math

### 11.4 Written Multiplication Sudoku

#### Instruction

Classic Sudoku rules apply. Additionally, the highlighted systems of digits form numbers, which satisfy the long multiplication, i.e. the last number is the product of numbers above.

#### Example

3					5
					2
			4	3	

#### Solution

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

### 11.5 Number 5 still alive

#### Instruction

Classic Sudoku rules apply. The sum of all numbers in a cage must be a number that ends with 5. No number appears more than once in a cage.

#### Example

1		3			
			3		2

#### Solution

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



## Round 11: Advanced Math

### 11.6 Squares in squares

#### Instruction

Classic Sudoku rules apply. Additionally, the sum of the numbers in each dark 2x2 square is a square. No number appears more than once in a grey 2x2 square.

#### Example

				6	
			3		
4			2		
		1			5
	2				
6					

#### Solution

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

### 11.7 Sudoku Squares

#### Instruction

Classic Sudoku rules apply. Additionally, the lines contain 13 different 3-digits square numbers (4 in example) that can be read left to right or top to bottom.

#### Example

	3				
6					
		2	4		
		1			

#### Solution

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



## Round 11: Advanced Math

### 11.8 X-Roman

#### Instruction

Classic Sudoku rules apply. Numbers to the left and right of the grid equal to total number of "I"s found in the Roman numeral representation of the first N digits in its corresponding row, where N is the first digit in that row on the side nearest the clue. Numbers above and below the grid equal the total number of "V"s found in the Roman numeral representation of the first N digits in its corresponding column, where N is the first digit in that column nearest the clue.

#### Example

	0	1	1	2	3	3	
1		2			5		8
3		5			2		6
5		3			6		3
7		6			3		1
6		1			4		5
8		4			1		3
	3	2	3	1	0	1	

#### Solution

	0	1	1	2	3	3	
1	1	2	3	4	5	6	8
3	4	5	6	1	2	3	6
5	2	3	1	5	6	4	3
7	5	6	4	2	3	1	1
6	3	1	2	6	4	5	5
8	6	4	5	3	1	2	3
	3	2	3	1	0	1	

### 11.9 Sudoku Fractions

#### Instruction

Put numbers  $\frac{1}{2}$ ,  $\frac{1}{3}$ ,  $\frac{2}{3}$ ,  $\frac{1}{4}$ ,  $\frac{3}{4}$ ,  $\frac{1}{5}$ ,  $\frac{2}{5}$ ,  $\frac{3}{5}$ ,  $\frac{4}{5}$  instead of 1-9 ( $\frac{1}{3}$ ,  $\frac{2}{3}$ ,  $\frac{1}{4}$ ,  $\frac{3}{4}$  in example) so that each number appears exactly once in each row, column and 3x3 outlined box. Letter N means that numbers in neighbouring cells have the same numerator. Letter D means that numbers in neighbouring cells have the same denominator. All possible letters N and D are given.

#### Example

1	-	N	-	-	-
-	-	2	-	-	N
D	D	-	D	3	D
-	N	-	-	-	-
-	-	-	N	-	4

#### Solution

$\frac{1}{3}$	N	$\frac{1}{4}$	$\frac{2}{3}$	$\frac{3}{4}$	
$\frac{3}{4}$		$\frac{2}{5}$	$\frac{1}{5}$	$\frac{1}{4}$	
$\frac{4}{5}$	D	$\frac{3}{5}$	$\frac{4}{5}$	N	$\frac{3}{5}$
$\frac{1}{4}$	N	$\frac{1}{3}$	$\frac{2}{4}$	$\frac{3}{5}$	$\frac{2}{3}$
$\frac{2}{3}$		$\frac{3}{4}$	$\frac{1}{3}$	N	$\frac{1}{4}$



## Round 11: Advanced Math

### 11.10 Determinant Sudoku

#### Instruction

Classic Sudoku Rules apply. Additionally, the number in the small square is equal to the determinant of the 2x2 matrix cells and the calculations is "(a\*d)-(b\*c)". In a matrix: a is the upper left cell, b is upper right cell, c is the bottom left cell and d is the bottom right cell.

#### Example

10	-3		-18	8	
		-3			
14	-7		4	-17	
		-8			
27	-8		5	3	

#### Solution

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

### 11.11 Integral Sudoku

#### Instruction

Classic Sudoku Rules apply. Additionally the highlighted cells apply the integral formula  $\int_a^b x dx = c = \frac{1}{2} (b^2 - a^2)$

where a is the cell below the integral, b is the cell above and c is the cell (or the ensemble of cells) on the right of integral. Each integral uses the cells of one colour (the letters repeat that information). Part of integral can be outside the grid.

#### Example

				C	
				$\int x dx =$	C
		B	C		D
	A	$\int x dx =$	B	B	$\int x dx =$ 12 <sup>D</sup>
	$\int x dx =$ B	A		D	
A					2

#### Solution

6	5	2	3	4 <sup>C</sup>	1
3	4	1	5	$\int x dx =$ 2	6 <sup>C</sup>
4	1	6 <sup>B</sup>	2 <sup>C</sup>	3	5 <sup>D</sup>
2	3 <sup>A</sup>	$\int x dx =$ 5	1 <sup>B</sup>	6 <sup>B</sup>	$\int x dx =$ 4 12 <sup>D</sup>
5	$\int x dx =$ 2 <sup>B</sup>	4 <sup>A</sup>	6	1 <sup>D</sup>	3
1 <sup>A</sup>	6	3	4	5	2



12.1 Classic	10 points
12.2 Diagonal	20 points
12.3 Diagonal + Killer	30 points
12.4 Diagonal + Greater Than Killer	40 points
12.5 Classic	10 points
12.6 Irregular	20 points
12.7 Diagonal Irregular	30 points
12.8 Even Diagonal Irregular	40 points
12.9 Classic	10 points
12.10 Consecutive	20 points
12.11 Kropki	30 points
12.12 Kropki Antiknight	40 points

There are 3 sets of 4 puzzles (1-4, 5-8, 9-12). Inside each set digits from grey cells in puzzle N should be copied to corresponding cells in puzzle N+1. Examples for puzzles from that round will not be provided, just an example to present round rule.

Examples for puzzles from this round will not be provided, only an example to present the round rule.

**Example**

	3	4	
2			1
4			3
	2	1	

			3
2			

**Solution**

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

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

## Round 12: Aftermath

### 12.1 Classic

#### Instruction

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

### 12.2 Diagonal

#### Instruction

Classic Sudoku rules apply. Numbers cannot be repeated on both marked diagonals.

### 12.3 Diagonal + Killer

#### Instruction

Classic Sudoku rules apply. Numbers cannot be repeated on both marked diagonals. The sum of all numbers in a cage must match the small number in the corner of the cage. No number appears more than once in a cage.

### 12.4 Diagonal + Greater Than Killer

#### Instruction

Classic Sudoku rules apply. Numbers cannot be repeated on both marked diagonals. The sum of all numbers in a cage must match the small number in the corner of the cage. No number appears more than once in a cage. Additionally, the sums of values of each cage must obey the relationship between the cages specified with '>' or '<'.

### 12.5 Classic

#### Instruction

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

### 12.6 Irregular

#### Instruction

Place a digit from 1 to 9 in each empty cell so that each digit appears exactly once in each row, column and outlined region. Each outlined region is marked by thick borders.

## Round 12: Aftermath

### 12.7 Diagonal Irregular

#### Instruction

Irregular Sudoku rules apply. Numbers cannot be repeated on both marked diagonals.

### 12.8 Even Diagonal Irregular

#### Instruction

Irregular Sudoku rules apply. Numbers cannot be repeated on both marked diagonals. Grey cells contain even digits.

### 12.9 Classic

#### Instruction

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

### 12.10 Consecutive

#### Instruction

Classic Sudoku rules apply. The dots between two cells indicate that the difference of the two digits in these cells is 1.

### 12.11 Kropki

#### Instruction

Classic Sudoku rules apply. A white dot between two adjacent cells requires that the value in one cell is exactly 1 greater than the value of the other cell (e.g. 3 & 4). A black dot between two adjacent cells requires that the value in one cell is exactly double the value of the other cell (e.g. 3 & 6). If there is no dot between two cells then none of the two conditions must be fulfilled.

### 12.12 Kropki Antiknight

#### Instruction

Classic Sudoku rules apply. A white dot between two adjacent cells requires that the value in one cell is exactly 1 greater than the value of the other cell (e.g. 3 & 4). A black dot between two adjacent cells requires that the value in one cell is exactly double the value of the other cell (e.g. 3 & 6). If there is no dot between two cells then none of the two conditions must be fulfilled. Additionally, no two identical digits can be a chess knight's move away from each other.



Each team will play at least 5 games against other teams. In each game there will be four 1-on-1 battles with 5 minutes time limit. Each battle won will give 1 small point to the team. Team with higher number of small points in the game will win the game and will get 3 big points. If both teams collected the same number of small points in the game, then both teams will get 1 big point. Pairs for each game will be drawn. Before the draw teams will be split into six 8-teams pots based on team classification at the end of day 1. Each team will play one game against a team from each other pot. Players from the same country can't be matched. Teams will be classified based on: 1) sum of big points, 2) difference between gained and lost small points, 3) result after day 1, 4) result in Round 9, 5) result in Round 8, 6) draw

Top 16 teams will qualify to second round. In second round teams will be matched based on their places after 5 games and following games will be played:

1-16, 2-15, ..., 8-9.

Winners will qualify to quarterfinals in which following games will be played:

Q1: Winner 1-16 - Winner 8-9

Q2: Winner 2-15 - Winner 7-10

Q3: Winner 3-14 - Winner 6-11

Q4: Winner 4-13 - Winner 5-12

Winners will qualify to semifinals in which following games will be played:

Winner Q1 - Winner Q4

Winner Q2 - Winner Q3

Winners of semifinals will qualify to the final.

If there will be a draw in second round, quarterfinal, semifinal or final then following tie-breakers will be used

- 1) team that collect 2 small points earlier will win the game,
- 2) team that collect 1 small point earlier will win the game,
- 3) team that was on higher place after 5 games

If player will complete a puzzle, player should grab a small item that will be put between two players playing in the same battle. If all battles in the game will end, then opponent of player that completed a puzzle should check if solution is correct (correct solution will be delivered by the referee). If puzzle is solved correctly, player that solved it will get 1 small point. If solution is incorrect - opponent will get 1 small point. Teams should determine the result of the game and give it to the referee. If players don't agree in terms of correctness of the solution - the referee will decide about it.

Points for teams will be given for small points (25 points), big points (100 points, only in group stage), place in top 16 (400 points), results in second round, quarterfinal, semifinal and final (400 points per win).

## Round 13: Tournament (team)

### One-on-ones order:

#### Round 1:

Diagonal

Antiknight

Classic

Windoku

Outside

#### Round 2 (Classic):

1-16, 8-9

4-13, 5-12

2-15, 7-10

3-14, 6-11

#### Quarterfinals (Antidiagonal):

1-8, 4-5

2-7, 3-6

#### Semifinals (Antiknight):

1-4, 2-3

#### Final (Classic):

1-2



## Round 13: Tournament

### 13.5 Outside

#### Instruction

Classic Sudoku rules apply. Additionally, digits outside the grid have to be placed in the first three cells from that direction.

#### Example

	2	2	3	1	2	3	
23	1					6	45
46		5					12
23			1				45
45				2			13
12					4		56
45	6					2	13
	3	1	2	3	1	1	

#### Solution

	2	2	3	1	2	3	
23	1	2	3	4	5	6	45
46	4	5	6	1	2	3	12
23	2	3	1	5	6	4	45
45	5	6	4	2	3	1	13
12	3	1	2	6	4	5	56
45	6	4	5	3	1	2	13
	3	1	2	3	1	1	



## Round 14: Wild Card

Round description → page 6

One-on-ones order:

### Round 1 (Classic):

16-17, 9-24

13-20, 12-21

15-18, 10-23

14-19, 11-22

### Round 2 (Diagonal):

1-16, 8-9

4-13, 5-12

2-15, 7-10

3-14, 6-11

### Quarterfinals (Antiknight):

1-8, 4-5

2-7, 3-6

### Semifinals (Consecutive):

1-4, 2-3

### Final (Classic):

1-2



## Round 15: Play-off

### Round description → page 6

15.1 Antidiagonal	.....
15.2 Antiknight	.....
15.3 Arrows	.....
15.4 Classic	.....
15.5 Classic	.....
15.6 Classic	.....
15.7 Consecutive	.....
15.8 Consecutive Sequence	.....
15.9 Diagonal	.....
15.10 Diagonal	.....
15.11 Fortress	.....
15.12 Integral	.....
15.13 Irregular	.....
15.14 Killer	.....
15.15 Kropki	.....
15.16 Liar Frame Sum	.....
15.17 Outside	.....
15.18 Quadruple	.....
15.19 Sequence Top-Bot	.....
15.20 Skyscrapers	.....
15.21 Squares in squares	.....
15.22 Sudoku Fractions	.....
15.23 Thermometer	.....
15.24 Windoku	.....

## Round 15: Play-off

### 15.18 Quadruple

#### Instruction

Classic Sudoku rules apply. Each set of four digits in the intersection of two lines indicates the digits that have to be placed in the four adjacent cells.

#### Example

1234				1246	
		2356		1244	
2456				1345	
	1124	1246			
	1246		1234		

#### Solution

4	2	5	3	6	1
1234				1246	
1	3	6	5	4	2
		2356		1244	
6	5	3	2	1	4
2456				1345	
2	4	1	6	5	3
	1124	1246			
5	1	2	4	3	6
	1246		1234		
3	6	4	1	2	5

