ORTEC Brain Crackers

In cooperation with WCPN

Dear reader,

Thank you for being a fan of puzzles!

Did you know that you can turn your abilities as "puzzle solver" into a professional career? At ORTEC, we want to improve the world using our passion for mathematics. We do this by solving complex business puzzles in a transparent, safe and sustainable way. Together, hundreds of puzzle solvers work from 17 offices around the globe to drive employee satisfaction, a reduced ecological footprint and improved financial performance for our customers.

Please join me in solving the nice puzzles in this booklet!

Michael van Duijn
CEO ORTEC

The puzzles in this Brain Cracker were made by the puzzle makers of the WCPN: The Dutch association for logic puzzles and sudokus. WCPN puzzle makers are known as some of the best puzzle and sudoku designers, not just in The Netherlands but also worldwide. Their puzzles are always handmade.

WCPN is an association, whose members like to recreationally or competitively solve logical puzzles. Each year, they organize the Dutch Championships for sudokus and logical puzzles in close cooperation with ORTEC. All WCPN members are invited to compete. The winners of these championships qualify to compete at the top level: the World Championships!

Each day, WCPN publishes new, handmade, puzzles on its website. Each month, the association's members receive a monthly overview of these beautiful, handcrafted puzzles and sudokus. Several times per year, WCPN organizes get-togethers for its members, where tips and tricks are shared and members can jointly solve puzzles. For those interested, WCPN also organizes trainings for people that want to learn how to design puzzles.

If you enjoy the puzzles in this Brain Cracker and can't get enough of them, we encourage you to join WCPN and get access to everything mentioned above. More information, as well as the registration form, can be found on wcpn.nl .

Happy solving!

On behalf of WCPN
Richard Stolk en René Gilhuijs

Check WCPN's website for registration and announcements about the Dutch Championships 2020 (or future editions).

World Class Puzzles
from the Netherlands

We are a family of smart explorative minds

We cherish our expertise

We feel connected to each other

We go the extra mile

We are everywhere around you, probably without you even realizing it. Among other things, we help our logistics customers to efficiently plan their routes and therefore reduce their CO_2 footprint; we help academic hospitals to efficiently plan their workforce and their schedule; we help our services customers to plan their visits to their customers; for an insurance company we developed a chatbot. In short, we offer solutions for companies around the world, making a difference in people's lives, for our planet and for the profits of our customers.

From our offices around the globe, we use our highly valued skills to uncover the true potential of applied mathematics, data science and optimization. This booklet is a bit like us: humorous and informal, yet clever and challenging. Solving the puzzles on these pages will feel a bit like being at one of our offices: we have fun, we do what we love, and we push each other to do better day after day, while solving complex puzzles for our customers.

If you want to know more about our impact, then follow us on LinkedIn or have a look at ortec.com. If you would like to take part in our movement to improve the world, you can check out careers.ortec.com.

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ORTEC.COM

The best puzzlers are… the ones that can come up with the tricks themselves!

An interview with

Karin Griffioen (Dutch Sudoku Champion, employee ORTEC)

Karin, born in 1986, is a multiple Dutch Champion in Sudoku and works at ORTEC as the Director of the Energy division. During her studies, she discovered that she has the ability to quickly solve sudokus. Today, Karin spends a lot of time solving operational puzzles at ORTEC, but they don't take up much of her spare time anymore.

Annick Weyzig (Dutch Puzzle Champion)

Annick, born in 1981, is a multiple Dutch Champion in Logic Puzzles. Since high school, Annick has been involved in puzzle championships and feels very comfortable among other puzzle fanatics. She believes her results have improved since she started testing puzzles for other championships.

Can you solve all puzzles easily when you know the tricks?

Karin: Easy may depend on your reference of course, but in my experience, if you feel you're really stuck in a puzzle, you're often missing one of the tricks.

Annick: No, the best puzzlers are the ones that can come up with the tricks themselves! The most fun puzzles are the ones that cannot be solved by using ordinary tricks.

Are women better at puzzling than men?

Karin: This is obvious right? Just look at the two champions. Unfortunately, I do believe The Netherlands is an exception on the world stage, most national champions are still men.

Annick: Although the Dutch Championship stage might suggest so, I think that women are not better or worse at puzzling than men. But the world of logic puzzling has been dominated by men for a long time. I'm happy to see that many women have discovered their talent and the fun of puzzling as well.

What are you most proud of?

Karin: I'm proud of the three live Dutch Championships we have hosted at ORTEC so far. Previously the championships were hosted online, but live championships are much more fun, and the participants really appreciate it.

Annick: I'm most proud of the fact that I have gained so much confidence in my puzzling abilities, that I can solve the puzzles during the Dutch Championship quite well without letting the stress get to me.

What would you like to say to aspiring puzzlers?

Karin: For many puzzle types, there is a lot of logic that isn't named in the rules, but by logical deduction it must be true. Tips for this can often be found online, so it's worth googling for tips and tricks – or trying to think of these logical deductions on your own.

Annick: Don't make it too big at the start. There are often more simple steps to take than you think at first glance. But most of all: puzzle together! That's way more fun than doing it on your own and you can teach each other a lot.

Annick and Karin shared their tips and tricks with us to help solve the puzzles faster. You can find these tips below each puzzle.

Thank you ladies!

This booklet contains different kinds of puzzles:

Typical ORTEC puzzles

We selected puzzles which are designed by (former) ORTEC colleagues combined with nice puzzles from puzzle prime and puzzlor. These puzzles have something in common: they represent the kind of puzzles that challenges us on a daily basis. These puzzles can be found on page 8 to 15.

Logic puzzles

Provided by WCPN. Puzzles which can be solved by using logic reasoning and using deduction strategy. Selected puzzles will sometimes be known from well-known puzzle books but will mostly be new to you. These puzzles can be found on all even pages, from page 16 to 46.

Sudokus

Provided by WCPN. Except for one classic sudoku puzzle, we have selected all kinds of sudoku variants which require additional rules and solving skills. Most of these variants cannot be found in the bookstore. These puzzles can be found on all odd pages, from page 17 to 45.

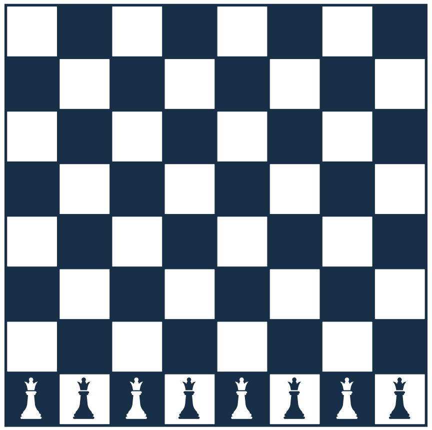
The answers to all of these puzzles can be found using the QR on page 47. Using this code, you can also find extended versions of the 'incident management' puzzle (page 15).

Eight Queens

By Puzzle Prime

Can you arrange the eight queens so that no two of them attack each other?

For an extra challenge, make sure that no three of them lie on a straight line.



Bus stop, bus goes…

By Gregor Brandt

A tourist arrives at a bus stop and wants to visit the beautiful city of Zoetermeer. As he sees it there are three possibilities:

1. A direct bus, line 1, to Zoetermeer, taking a scenic drive that will last 45 minutes, going on average once per hour.
2. A route with a transfer. In this case he would have to take line 2, arriving on average 2 times per hour at his stop, drive 15 minutes to a bus station, transfer to line 3 that also arrives on average 2 times per hour at the bus station and drive in 15 minutes to beautiful Zoetermeer.
3. Walk the distance to Zoetermeer, which would take 80 minutes.

The tourist has no knowledge of expected arrival times of the busses other than the average number of times the busses go per hour. Two questions:

1. **What should his traveling strategy be in order to get soonest in Zoetermeer?**
2. **If he arrives at 12.00h at the bus stop, what is the expected time he will be in Zoetermeer when using the quickest expected traveling strategy?**

Tuples of tulips By Gregor Brandt

The tulip grower in Lisse received his last shipment of tulips bulbs. He had ordered bulbs from all over the world and was very pleased to see them all together. Exactly 100 different shipments in total he had received. Every shipment contains a seemingly arbitrary number of tulips of one species, so 100 species in total. What a beautiful view that is going to be, when all bulbs have been planted and tulips have grown out of them.

But then it struck him. He had reserved 10 lanes for the bulbs, each 1 meter wide. If every bulb will result in a tulip covering a space of 10 by 10 cm, in which lane should he plant each of the bulb species? He concluded he only had three wishes:

1. Each of the lanes should contain exactly 10 different species of tulips.
2. Each of the rows of a lane contains 10 bulbs, except the last row that can contain at least 1 and at most 10 bulbs.
3. The difference in length of the longest lane and the shortest lane would have to be as small as possible. Assume here that for example a lane with 41 tulips would have the same length as a lane with 49 tulips, both 50 cm, giving at least 1 and max 10 tulips per row of 10 cm in a lane.

He received the following amounts of tulips (where every number indicates the number of tulips of one species):

761	844	7819	3233	3317	6286	5857	3643	7884	2013
1165	1223	9785	6668	2754	9735	1088	3317	2278	8570
1493	1878	1800	358	2868	1855	3230	7582	6089	5581
2083	3360	5886	1051	8240	2669	9430	3878	3876	6472
2341	3363	1011	2252	6285	2623	4180	5533	140	1758
3110	4539	914	8769	5192	3700	1326	3986	7315	7533
4951	5687	9328	7000	5839	4536	2020	3580	3645	158
5811	6682	5182	6023	24	5175	5687	1109	8174	8107
3917	7236	2491	4982	9392	1987	2394	2574	8933	3480
7505	9693	3216	7285	1043	7077	7521	5414	3762	386

Can you help him to divide the tulips species over the lanes? What will be the difference in length between the longest lane and the shortest one?

Easy as ORTEC By Hns Eendebak

Fill the grid with letters ORTEC so that each row and each column contain each letter exactly once. Some cells remain empty. Letters outside the grid indicate the first letter in that row or column from that direction.

	O	R	T	E	C		
							T
							O
O							R
C							
							C
	R	E		R			

Container stacking
By Jelke van Hoorn

How many non-overlapping rectangles of 100 by 28 can be drawn upon a surface of 1200 by 800?

Gun duel

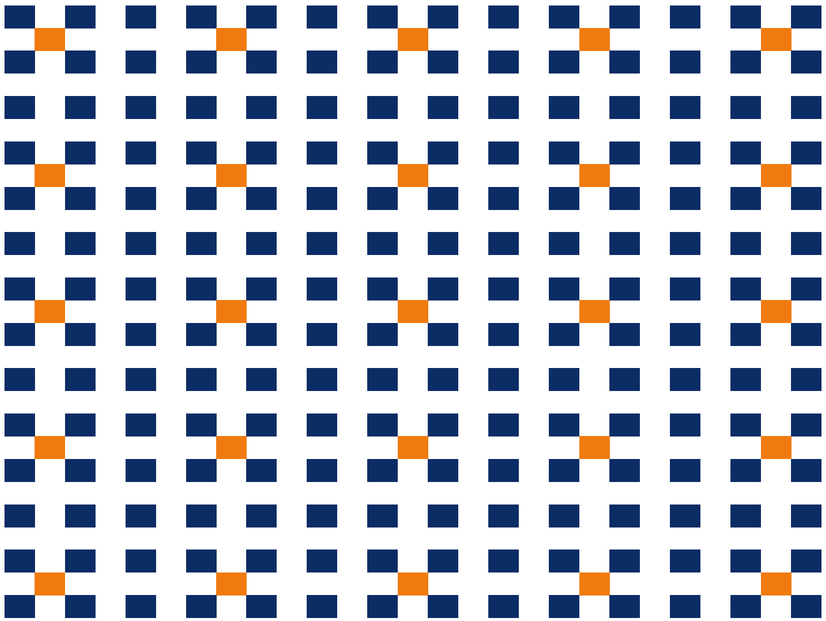
By Puzzle Prime

Mick, Rick, and Nick arrange a three-person gun duel. Mick hits his target 1 out of every 3 times, Rick hits his target 2 out of every 3 times, and Nick hits his target every time. If the three are taking turns shooting at each other, with Mick starting first and Rick second, **what should be Mick's strategy?**

Emergency situation

By Adriaan Tas

Below you see a schematic overview of the streets of Zoetermeer. The mayor of Zoetermeer wants to have ambulances ready in the city. He demands that each crossing can be reached by an ambulance that has a standby location no more than 3 crossings away. Below you see (in orange) a solution with 25 ambulances. Can you find a set of standby locations with a minimum of ambulances?



The "8A"-issue

By Gregor Brandt

A friend of mine works for a large cable company that operates worldwide. He sent me a rather short WhatsApp message saying: "yo math wizz, what are the chances that a 2 characters substring occurs in an 8-character hexadecimal code?"
Intrigued by the question but feeling numb by the incompleteness of information we got into a WhatsApp conversation.

It turns out that:

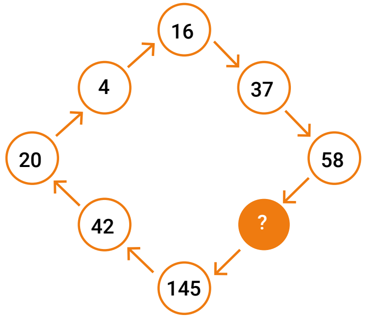
- 4.000.000 setup boxes have been distributed.
- Each setup box has a (assumed random) registration code consisting of 8 hexadecimal characters.
- There is an error in the software that causes a problem with all setup boxes that contain the substring "8A" in the registration code.
- To fix the error, all the faulty setup boxes need to be serviced which costs an average of 45 Euro per faulty setup box.

Obviously, he wants to have an estimate of the damage his company would suffer.

What is the estimated damage rounded to whole Euros that I should App back to him?

Number cycle

By Minh Nguyen



There's a pattern to this cycle of numbers.

What number should go into the space with a question mark?

Restaurant scheduling

By Puzzlor

After faithfully serving the O.R. profession for 50 years, you decide to retire and open a restaurant. Among the hundreds of details with opening a restaurant, you need to hire and schedule employees. Based on the foot traffic of other restaurants in the area, you expect that you will need the following number of employees each day:

Employees Schedule

Day of week	Employees Needed
Monday	4
Tuesday	5
Wednesday	5
Thursday	10
Friday	12
Saturday	12
Sunday	2

Your employees will work four consecutive days and then have three days off. They will be paid $100 for each day they work. In your rush to get the restaurant started, you haphazardly hire 17 employees. Five will start on Monday, five will start on Thursday and seven will start on Friday. This schedule satisfies the above work requirements, but you have no idea if there is a better solution.

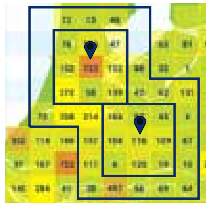
How much money would you save each week from your current schedule if you optimized your workforce?

Incident management

By Mathijs Waegemakers

As the head of analytics for a train company, you have been asked to optimize the location of incident responders where your company wants to provide service. The area is represented by a map of multiple squares in the accompanying image.

A responder can be placed on any non-water square. Once placed, a responder provides service to that square and surrounding squares. Distance is calculated as the crow flies and water can be crossed easily.



0 x (723 + 116) = 0
1 x (76 + 164 + 47 +152 + 139 + 58 +272 +152 + 166 + 97 + 45 + 109 + 19 + 125 + 6 + 104) = 1731
2 x (72 + 13 + 46 + 88 + 42 + 62 + 131 + 6 + 67 +15 + 64 + 69 + 56 + 497 + 38 + 117 + 157 + 214 + 258 + 73)= 4170
Etc.

Total response time = Distance x number of incidents

Place 3 incident responders within the Netherlands. Where to allocate them to minimize the total response time?

MASYU

Draw a single closed loop that passes through all circles in the grid by traveling horizontally and vertically. The loop must make a 90° turn in all black circles and go straight through both neighbouring cells before turning again. The loop must go straight through all white circles and make a 90° turn in at least one of the neighbouring cells.

By Richard Stolk

	○		○		●				
									●
		●					○		
	○								
				○		●			
	●		○		●				
●									
		●						●	
○									
				○		●		○	

Annick's tip: Start with the circles along the edges. Make sure you don't make small loops: how do you connect all segments to create one single closed loop?

SUDOKU

Place the digits 1-9 in each row, column and 3x3 block.

By Richard Stolk

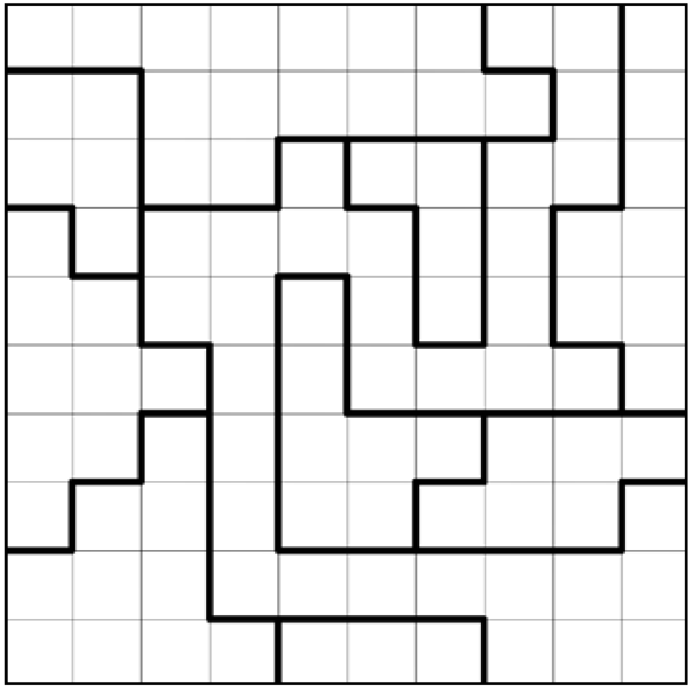
				3	5		2	1
		1		9				7
	2	4						
			1	4				
1	9		6			4		
8						9	1	
				7	6			
4					2			8
2	3						7	9

Karin's tip: A bit silly maybe, but you can use the fact that each sudoku always has a unique solution: There can never be a 'rectangle' (4 cells, over 2 rows, 2 columns and 2 3x3 boxes) that doesn't contain a given number, and contains only the same 2 options; one of these 4 cells has to contain a 3rd number. This is because otherwise there would be 2 solutions to the sudoku, and that isn't allowed.

STAR BATTLE

Place two stars with the size of one cell in each row, column and bold outlined region. Stars may not touch each other, not even diagonally.

By Hns Eendebak

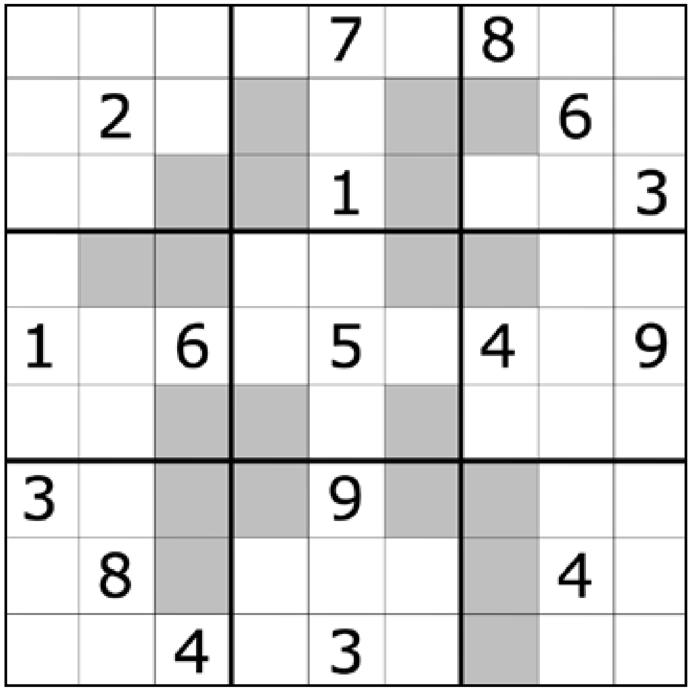


Annick's tip: Many cells cannot contain a star, because they rule out stars in too many of the other cells. Start looking for these cells in or near the smaller areas.

SUDOKU – RENBAN

Place the digits 1-9 in each row, column and 3x3 block. The digits in each connected area of grey cells form a renban group. That is a group of consecutive digits, in random order.

By Wilbert Zwart

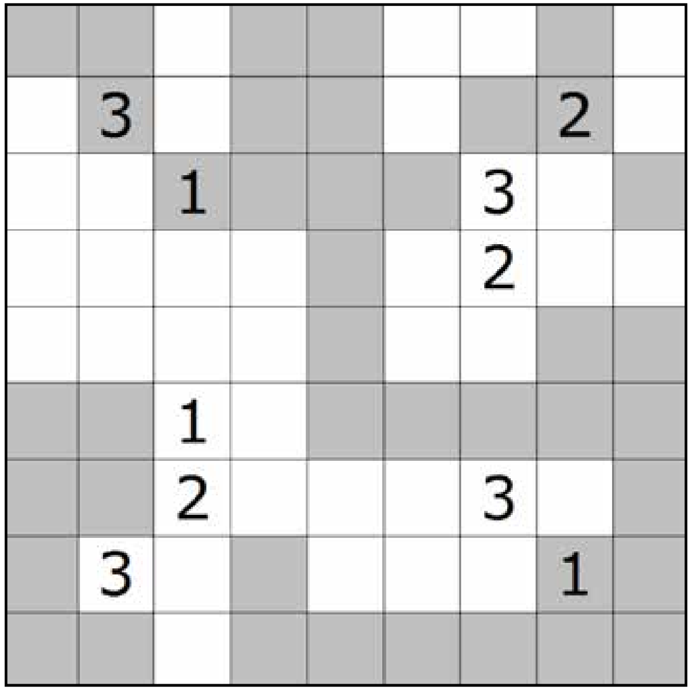


Karin's tip: If a renban block is 5 cells in size, it has to at least contain the digit 5 (similarly if it is 6 cells in size, it has to contain the digits 4, 5 and 6, etcetera). Also, it is useful to look at 'middle' numbers (e.g. 4/5/6); for example if a renban block of 5 cells cannot contain the digit 6, you immediately know it has to contain the digits 1-5.

NEIGHBORS

Place the digits 1-3 three times in each row and column. Grey cells have no adjacent cells containing the same digit. White cells have at least one adjacent cell containing the same digit. All grey cells are given.

By Hns Eendebak

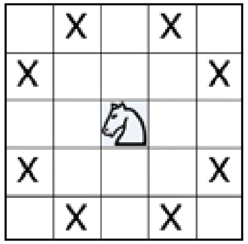


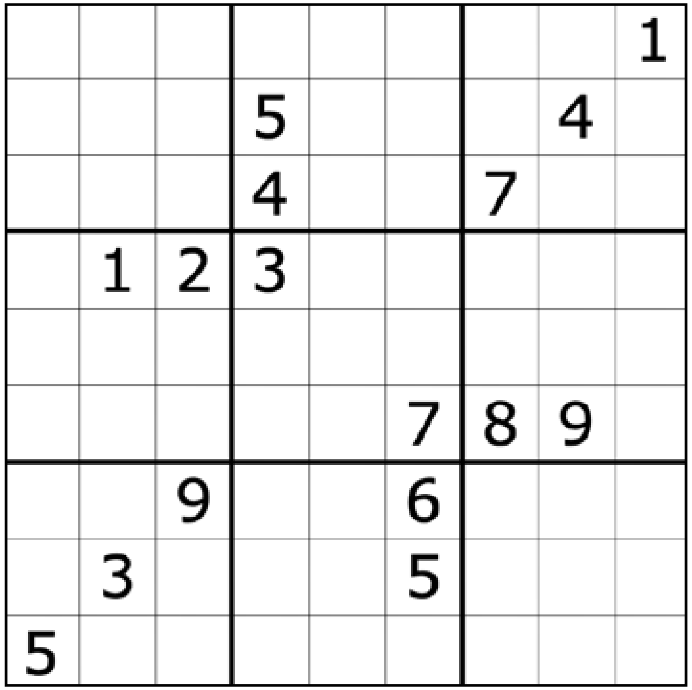
Annick's tip: White cells have at least one white neighbor which contains the same digit, so if a white cell only has one white neighbor, these have to be equal. If there are a lot of grey cells in one row/column, check how you can place equal digits without touching each other.

SUDOKU - ANTI KNIGHT

Place the digits 1-9 in each row, column and 3x3 block. Two cells that can be reached by a (chess) knight-step may not contain the same digit.

By Richard Stolk



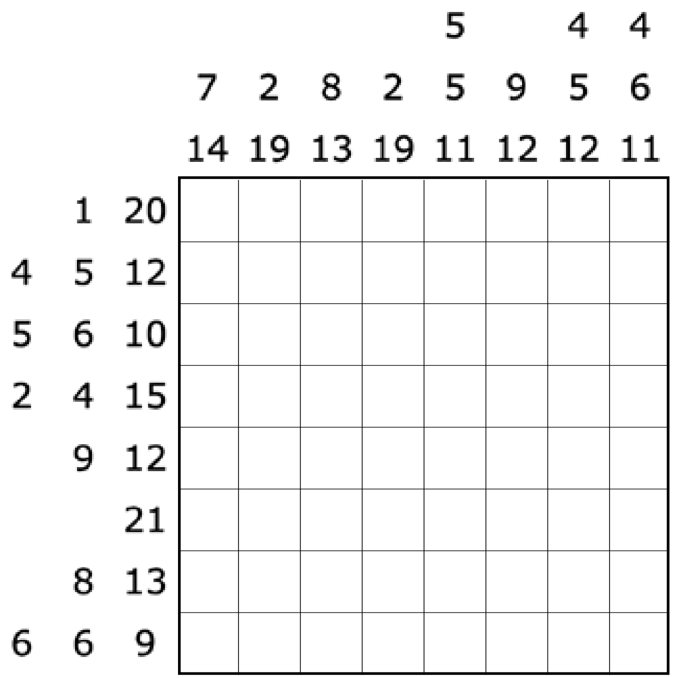


Karin's tip: The anti knight rule often rules out a digit in one or two entire row(s) or column(s) of a 3x3 cell. If there is only one row/column left where a digit can be placed, that digit cannot appear outside of that block in that row or column.

JAPANESE SUMS

Place digits 1-6 into some cells such that no digit is repeated within a row or column. Clues outside the grid indicate the sums of contiguous blocks of digits in that row or column. Blocks have to be separated by at least one empty cell.

By Richard Stolk

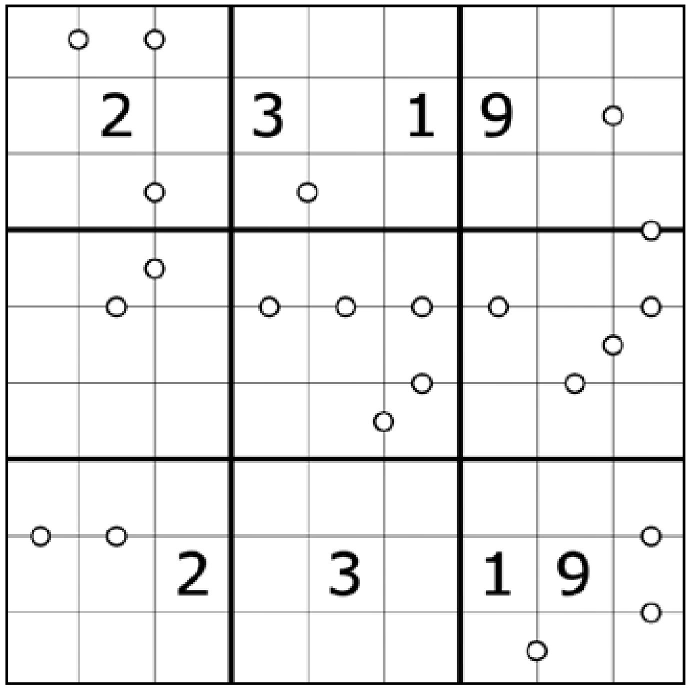


Annick's tip: How many digits do you need for the larger sums? Mark the cells which definitely have to contain a digit.

SUDOKU - CONSECUTIVE

Place the digits 1-9 in each row, column and 3x3 block. All horizontally and vertically neighbouring digits with a difference of 1 are marked with a circle.

By Richard Stolk



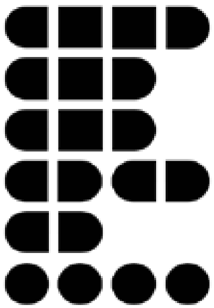
Karin's tip: Try to find a sequence of horizontally and vertically adjacent cells with circles between all of them. This is often a good place to start, since there are only a few (or one) options to fill this sequence. Also, it is important to use the information of missing circles: if there is no circle, two adjacent cells cannot be consecutive.

BATTLESHIPS

Place the given fleet in the grid, with every ship segment filling a single cell. Ships are placed horizontally or vertically, and do not touch each other, not even diagonally. Cells with water remain empty. Clues outside the grid indicate how many cells are occupied by ship segments.

By Bram de Laat

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



Annick's tip: Check where the larger ships (3 or 4 cells) fit. Often, this already gives you some information on where some parts of the ships should go. Also, indicate the areas where no ship parts can go.

SUDOKU – EVEN SANDWICH

Place the digits 1-9 in each row, column and 3x3 block. Clues outside the grid indicate all digits that have an even digit as neighbour on both sides in the respective row or column.

By Richard Stolk

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

Karin's tip: It helps to indicate cells that have to contain an even or an odd digit (e.g. by indicating them with circles for odd digits and squares for even ones), even if you're not sure yet which digit it should be. This way, if you already have 4 even digits in a row, column or 3x3 block, you know that all other cells have to be odd.

DOMINO

Place the given set of dominoes exactly once in the grid, by drawing their boundaries.

By Wilbert Zwart

0 0						
0 1	1 1					
0 2	1 2	2 2				
0 3	1 3	2 3	3 3			
0 4	1 4	2 4	3 4	4 4		
0 5	1 5	2 5	3 5	4 5	5 5	
0 6	1 6	2 6	3 6	4 6	5 6	6 6

5	5	3	4	6	6	1	2
0	0	0	4	5	6	3	5
1	6	3	2	2	0	3	5
1	4	2	2	2	2	1	5
1	3	4	5	6	6	1	0
1	3	3	0	6	4	1	0
2	5	4	4	4	6	3	0

Annick's tip: Find dominoes that can only fit in one place.You can use the fact that there is one unique solution: there should never be an area of 2x2 where you could divide the area into the same 2 stones in 2 different ways.

SUDOKU – NON XV

Place the digits 1-9 in each row, column and 3x3 block. No digits in two adjacent cells sum up to 5 or 10.

By Hugo van Rooijen

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

Karin's tip: The lower numbers (1-4) have double the information that the higher numbers (6-9) have: e.g. a 1 cannot be next to a 4, but it can also not be next to a 9. If you see that a lot of 4's and 9's are given, it often makes sense to look at the 1's next, because the 4's and 9's probably eliminate a lot of options for the 1's.

CORAL

Blacken some cells to create a single connected group of cells (the coral), without enclosing any white cells. No 2x2 area may be fully blackened. Clues outside the grid indicate the lengths of connected shaded cells in the corresponding row or column. Clues are given in increasing order and not necessarily in the order the blocks appear. There must be at least one white cell between two blocks of black cells.

By Alex Samsom

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

Annick's tip: Start with the rows and columns that must be (almost) full. Which cells have to be black? Since the white cells may not be enclosed and black cells have to be connected, there can never be a 2x2 checkerboard pattern anywhere.

WINDOKU

Place the digits 1-9 in each row, column, bold outlined 3x3 blocks as well as the four grey regions.

By Arvid Baars

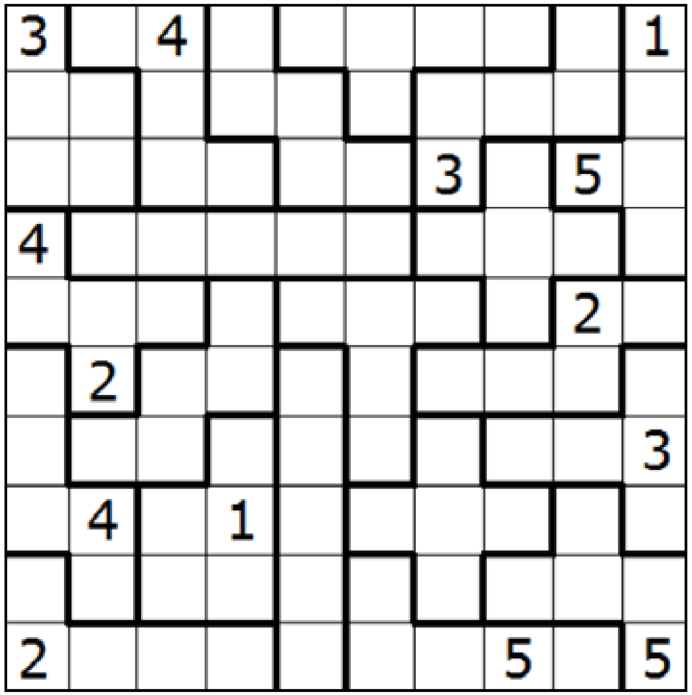
8	1						9	5
3				9				1
				8				
	4	6				8	3	
				2				
7				5				9
6	8						7	3

Karin's tip: Because of the placement of the grey boxes, there are actually 5 other 'hidden' areas which have to contain the digits 1 through 9. For example: R1C234, R5C234 and R9C234 together also have to contain digits 1-9. Can you figure out why this is? And can you see the other 4 'hidden' areas?

CAPSULES

Place the digits 1-5 exactly once in every bold outlined area. Equal digits never touch each other, not even diagonally.

By Richard Stolk



Annick's tip: The capsules are often placed so that 1 cell of one capsule, touches 4 of the 5 cells of another capsule. That cell must then be equal to the fifth cell of the other capsule.

SUDOKU – DIAGONAL

Place the digits 1-9 in each row, column, 3x3 block and both diagonals.

By Arvid Baars

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

Karin's tip: If a certain digit has to occur in one of the two corners of one diagonal (so it cannot go anywhere else on that diagonal), it can never occur on a corner of the other diagonal.

DICE

Four dice contain 24 different letters. By random rolls of the dice the listed words can be produced. Determine which letters are on each dice.

By Saskia Benedictus

BYTE
CHIP
COAX
DECT
JUNK
LINK
MAIL
PEND
SURF
TAGS
VLOG
WIRE
XRAY

Dice 1	Dice 2	Dice 3	Dice 4

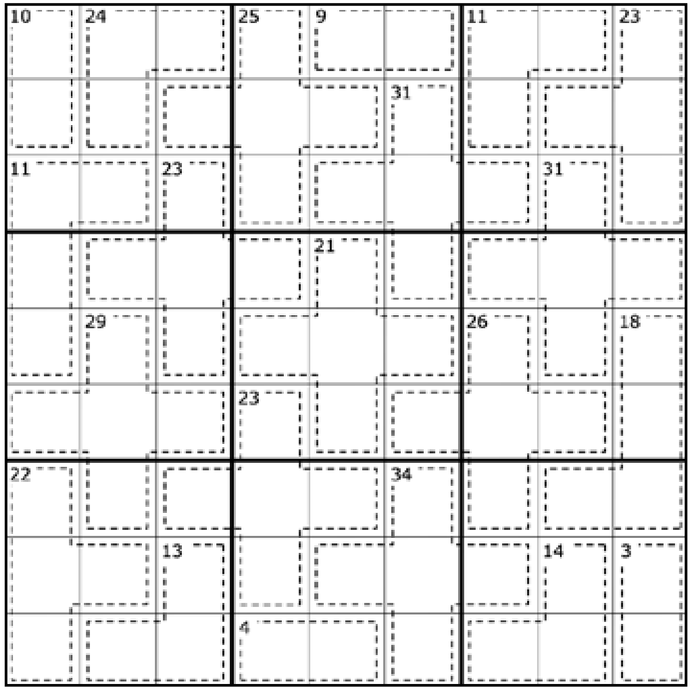
TIP

Annick's tip: Find two words that have two letters in common. Use other words to determine where the other letters of these two words should go.

SUDOKU - KILLER

Place the digits 1-9 in each row, column and 3x3 block. The small numbers in the upper left corner of the dotted outlined areas indicate the sum of the digits in that area. Within a dotted outlined area all digits must be different.

By Richard Stolk



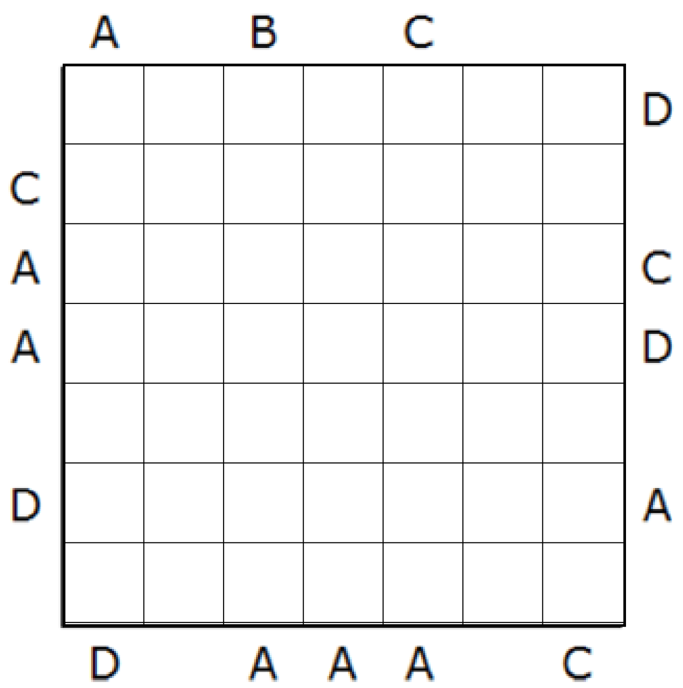
Karin's tip: It is useful to look for sums that cover almost the entirety of a 3x3 block, and realize that the sum of the entire 3x3 block is always 45 (the sum of 1-9). This helps you determine what the sum of the remaining cells in that 3x3 block should be. Of course, you can also apply this logic to a row or column, or even 2 or 3 rows/columns/blocks.

TIP

EASY AS ABC

Place the letters A-D exactly once in every row and column. Some cells remain empty. Clues outside the grid indicate the first letter in that row or column as seen from that direction.

By Saskia Benedictus

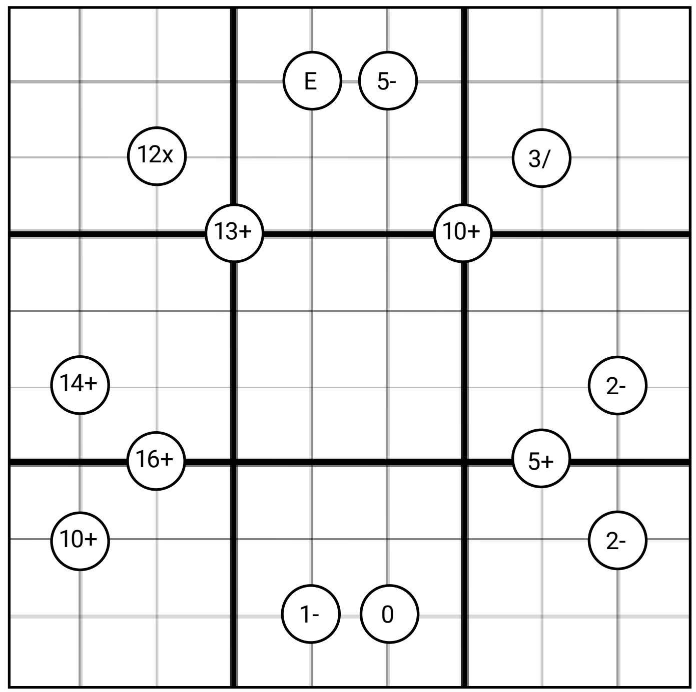


Annick's tip: Start with the edges: Check how far the first letters can be from the edge. When you try to fill in the edges, have a good look at the opposite edge as well.

SUDOKU - MATHRAX

Place the digits 1-9 in each row, column and 3x3 block. Some intersections of the grid lines are marked by a number and an operator (+, -, x, /) in a circle. The number is the result of the arithmetical operation, applied to both pairs of diagonally opposite cells. An "E" in the circle indicates that all four adjacent digits are even; an "O" indicates that all four adjacent digits are odd.

By Arvid Baars

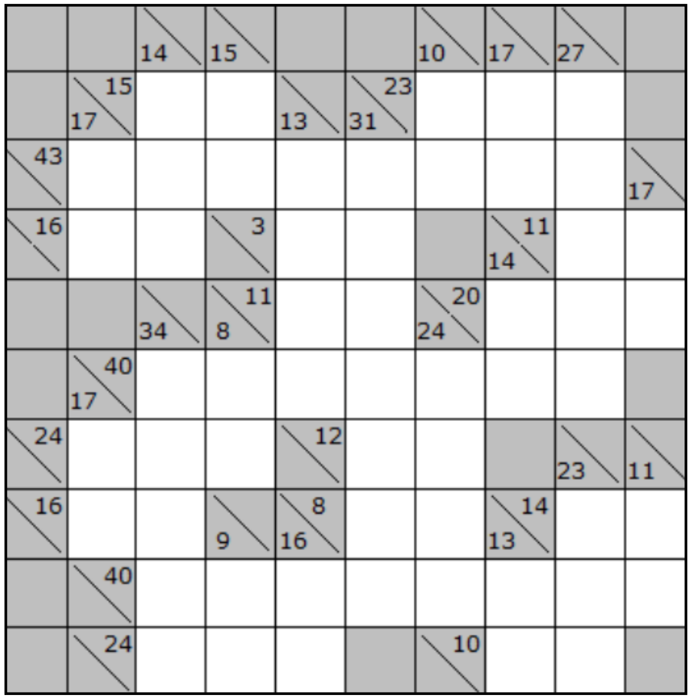


Karin's tip: Start where the areas covered by a circle overlap with the areas covered by another circle. If you combine the options you have for one circle with the options for the other circle, often there is only 1 option (or only a few) left.

KAKURO

Fill all white cells using digits 1-9, such that the sum of each block of digits equals the clues in the grey cells. A clue above a diagonal applies to the block of digits to its right. A clue beneath a diagonal applies to the block of digits below it. Within a block all digits are different.

By Richard Stolk

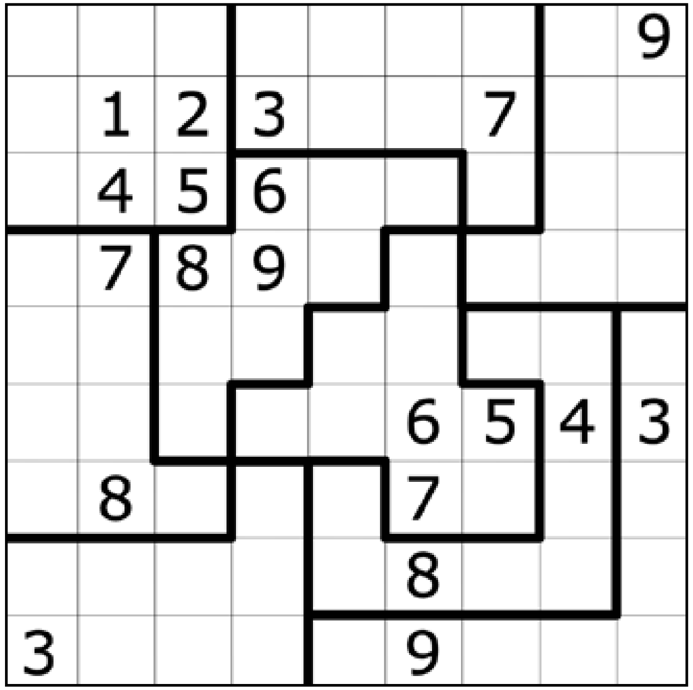


Annick's tip: Many sums can only be made with one combination of digits. Check the areas where high sums with few cells and low sums with many cells cross.

SUDOKU – CHAOS

Place the digits 1-9 in each row, column and bold outlined area.

By Richard Stolk



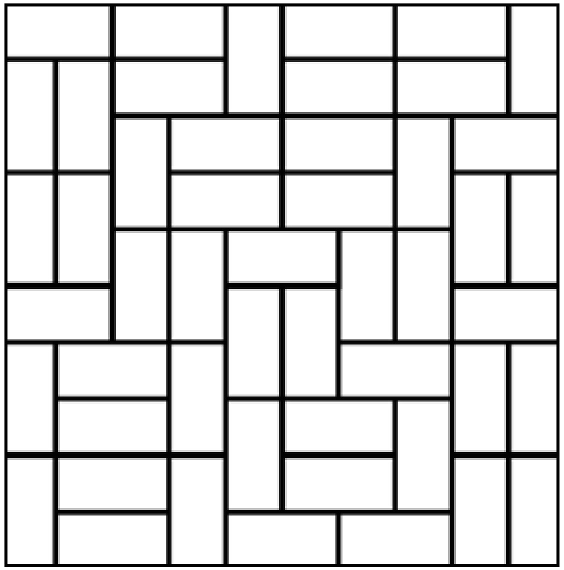
Karin's tip: If you take n rows, and n regions that almost overlap with these n rows, you will find some cells 'sticking in' and 'sticking out.' The digits in the cells sticking out, always have to be the same as those in the cells sticking in.

MAGNETS

Place magnets into some of the 1x2 blocks with each magnet having a positive and a negative pole. Cells containing magnet halves of the same polarity cannot be adjacent. Clues outside the grid indicate the number of positive and negative poles in the respective row or column.

By Tom Groot Kormelink

+		3	3	4	2	4	4	4	3	3	4
	-	3	4	2	4	2	4	5	3	4	3
5	4										
3	3										
3	3										
2	4										
4	3										
3	3										
4	4										
3	3										
3	5										
4	2										



Annick's tip: Check how the magnets cross rows/columns, when the number of plusses and minuses is not equal. Also, check the rows/columns that have to be (almost) full: which cells have to be magnets for sure?

SUDOKU EXTRA REGIONS

Place the digits from 1 to 9 in every row, column, outlined 3x3-block and the four grey regions.

By Richard Stolk

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

Karin's tip: Here, you have to combine normal sudoku logic with the extra regions: for example if a digit can only go in a few cells in a 3x3 area, and those cells are all part of the same extra region, that digit cannot go anywhere else in that grey area.

SKYSCRAPERS

Place the digits 1-6 exactly once in every row and column. Each digit represents a skyscraper of that height. Clues outside the grid indicate how many buildings can be seen from that direction, where higher buildings block the view of lower buildings.

By Bram de Laat

			1		5		
4							
							5
4							
1							4
				4			

Annick's tip: Where does the highest building go? Indicate for yourself which cells have to be higher than a certain neighbor.

SUDOKU - BETWEEN 1 AND 9

Place the digits 1-9 exactly once in each row, column and 3x3 block. Clues outside the grid indicate the sum of the digits that are placed between the digits 1 and 9 in the respective row or column.

By Richard Stolk

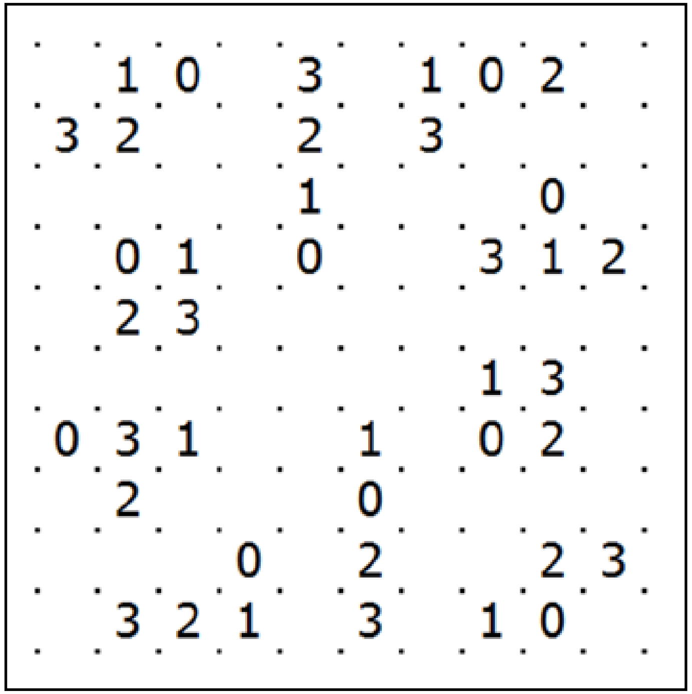
	35	8	19	26	7	26	10	4	6
23									
2		1							
5			3						
6									
25					4				
5									
2							1		
16								9	
7									

Karin's tip: Start with the high numbers (35 is the maximum), these rule out a lot of options where the 1 and 9 can go in that row/column. Combining this information over rows and columns often tells you where a lot of the 1's and 9's have to go.

SLITHERLINK

Draw a single closed loop in the grid by connecting the dots. The loop cannot touch itself, not even diagonally. The digits indicate how many parts of the loop are directly beside, under or above that digit.

By Bram de Laat

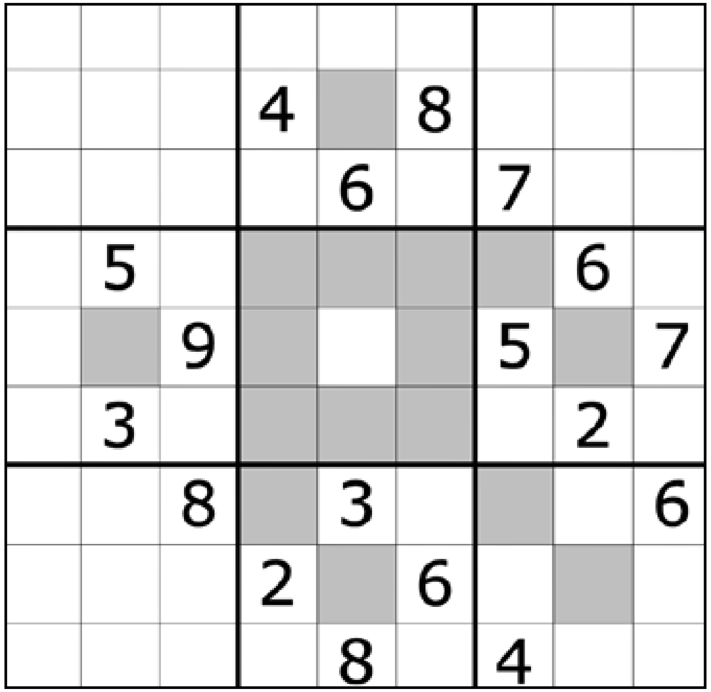


Annick's tip: Indicate in the grid where there cannot be lines. There are many patterns that occur frequently. For example, if there is a 3 in a corner of the grid, there are always the same 2 lines you can already draw. The same is true for other numbers in the corners, as well as other patterns elsewhere in the grid.

SUDOKU – FIRST IMPRESSION

Place the digits 1-9 exactly once in every row, column and 3x3 block. A digit in a grey cell is greater than both the first digit in the same row and the first digit in the same column.

By Arvid Baars

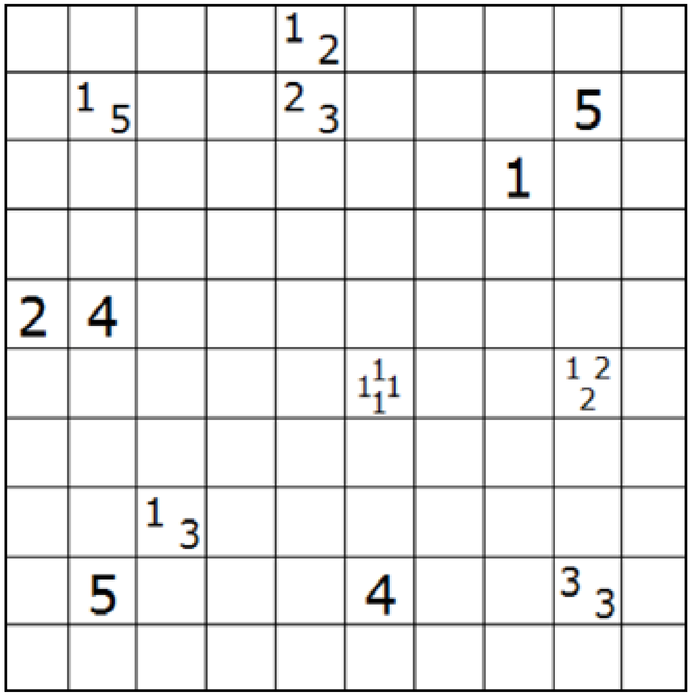


Karin's tip: Try starting with the 1's and the 9's. A 1 can never occur in a grey cell. The first digit of a row/column can never be a 9 if that row/column also contains a grey cell somewhere.

TAPA

Blacken some cells such that all the black cells are orthogonally connected and form one contiguous wall, without having any 2x2 area fully blackened. Clue cells remain empty and indicate the length of each consecutive block of black cells in the eight surrounding cells. When there are more clues in one cell, the blocks indicated by different clues must be separated by at least one white cell.

By Arvid Baars

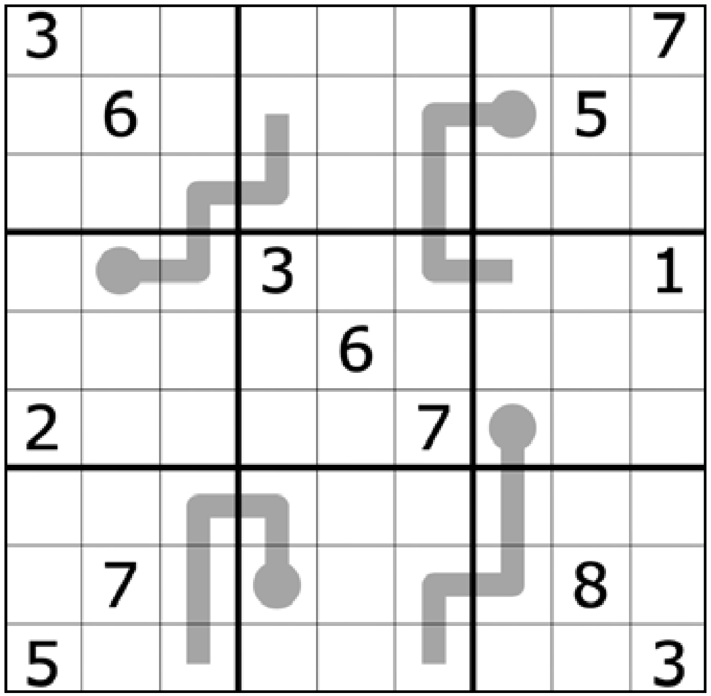


Annick's tip: Check out the large numbers: which cells around them have to be black for sure? In addition, check how you can connect all the black cells.

SUDOKU - THERMOMETERS

P3lace the digits 1-9 in every row, column and 3x3 block. The digits in each thermometer are different and, starting at the bulb, are placed in increasing order.

By Richard Stolk

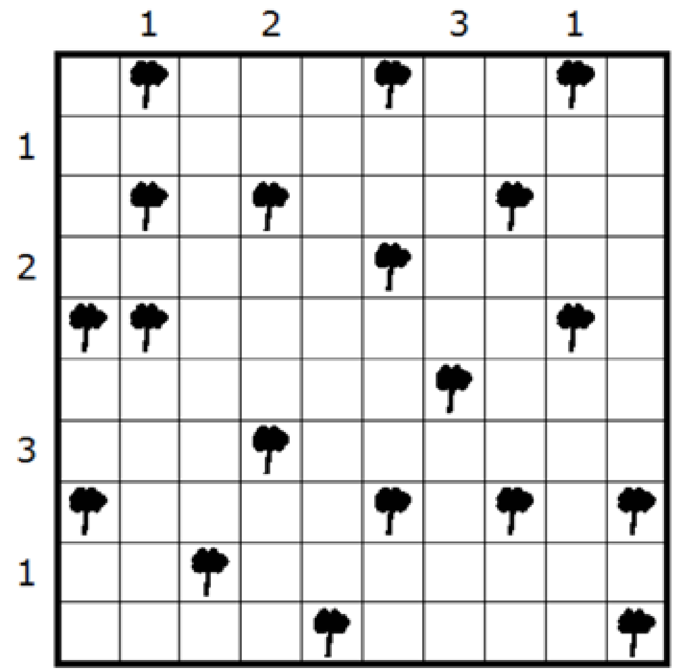


Karin's tip: Start with the longer thermometers (typically 5 or more cells): often there are only a few options per cell in the thermometer. Also, look at the 1's and 9's: often the thermometers rule out a lot of options where these can go.

TENTS

Attach a tent to each tree, in a horizontally or vertically adjacent cell. Cells with tents do not touch each other, not even diagonally. Clues outside the grid indicate the number of tents in that row or column.

By Hugo van Rooijen



Annick's tip: When trees are close together, placing one tent often creates a chain-reaction of where other tents need to go. Any 2x2 area can contain at most 1 tent.

Scan the QR-code and find the answers to all puzzles depicted in this puzzle book.

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We reduced the CO_2 footprint of 380 customers by 640 kiloton CO_2

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We improved the financial performance of our customers by almost 800 million Euro