

Number Placement

Sudoku rules: Place a number from 1-9 in each cell. Each row, column, and outlined 3x3 square contains all the numbers 1-9 exactly once.

Puzzle 1 (by R. Kumaresan)

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

Common techniques

- Cell where only one number may be placed there
- Noting when a 3x3 only has a few candidates for a number
- Pairs and triples

1	2	3						
			1	2	3			
							12	12
						1		
						2		

1		2						
				5	6	7	8	
3		4						

1	2	3	4	5				
9	9	9						
							9	

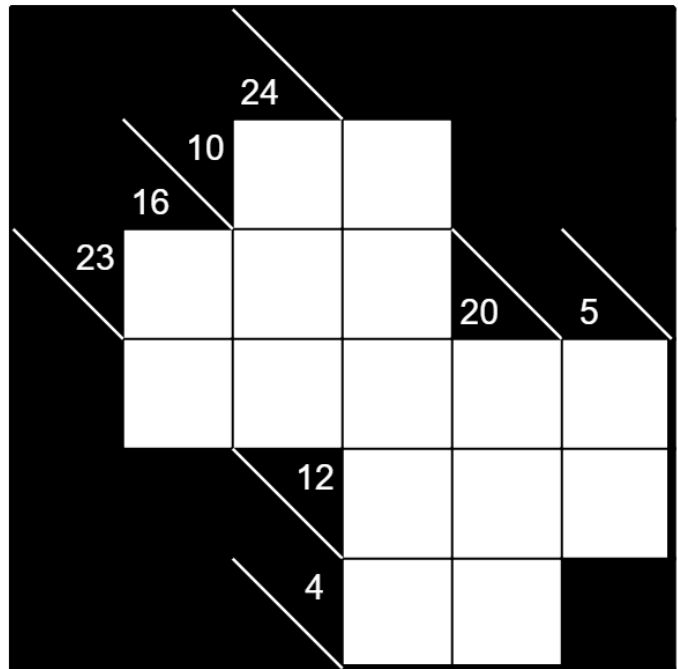
- X-wing

3	4	5	6	12	7	8	12	9
4	5	6	7	13	8	9	13	2

Kakuro rules: Place a number from 1-9 in each cell.

- A clue on the right of a cell tells the sum of the numbers to the right. A clue on the bottom of a cell tells the sum of the numbers below.
 - Clues can't see through blocked cells.
- Numbers may not repeat in a horizontal or vertical run of cells.

Puzzle 2 (by Kaz)



Common techniques

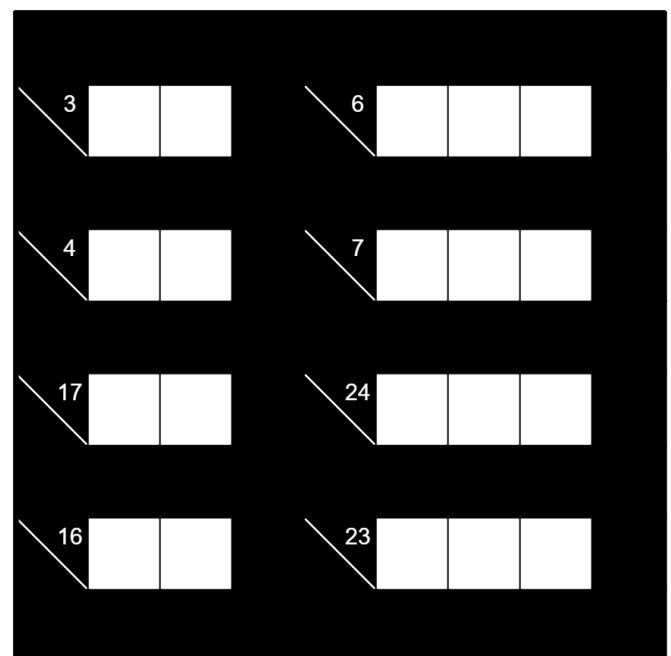
- Look for large clues / small clues
- It's not too useful to write 5+ candidates in a cell. At that point it may be more useful to remember (or write outside) what numbers *can't* be in a cell
- Don't be afraid to do scratchwork!
 - Basic arithmetic is **NP-hard** hard
- Various common sums (on the right)

Larger sums:

- $30 = 9+8+7+6$
- $35 = 9+8+7+6+5$
- $45 = 9+8+7+6+5+4+3+2+1$

How can you quickly tell that

$$41 = 9+8+7+6+5+3+2+1 ?$$



Now it's your turn! Classwork/homework: Complete 2 puzzles.
 (Feel free to skip to the Kakuro section if you're allergic to Sudoku)

Puzzle 3 (by Rajesh Kumar) 🌶️🌶️

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

Puzzle 4 (by R. Kumaresan) 🌶️🌶️🌶️

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

Puzzle 5 (by Sam Cappleman-Lynes)



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

Puzzle 6 (by Walker Anderson)



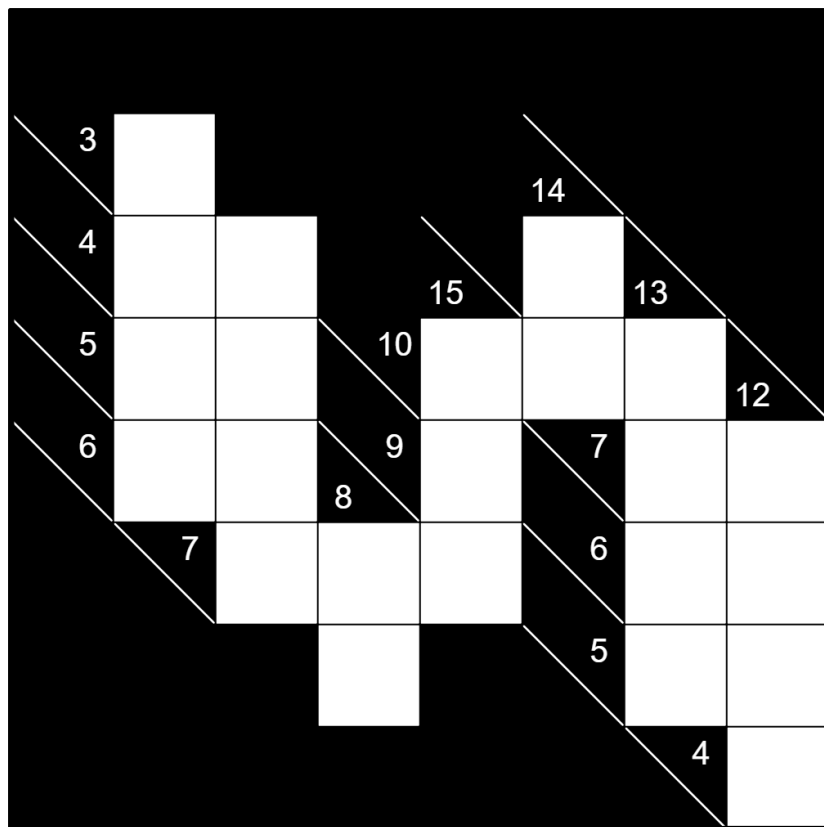
Variant rules (palindrome)!

The numbers on the gray line form a palindrome (reads the same forward and backward).

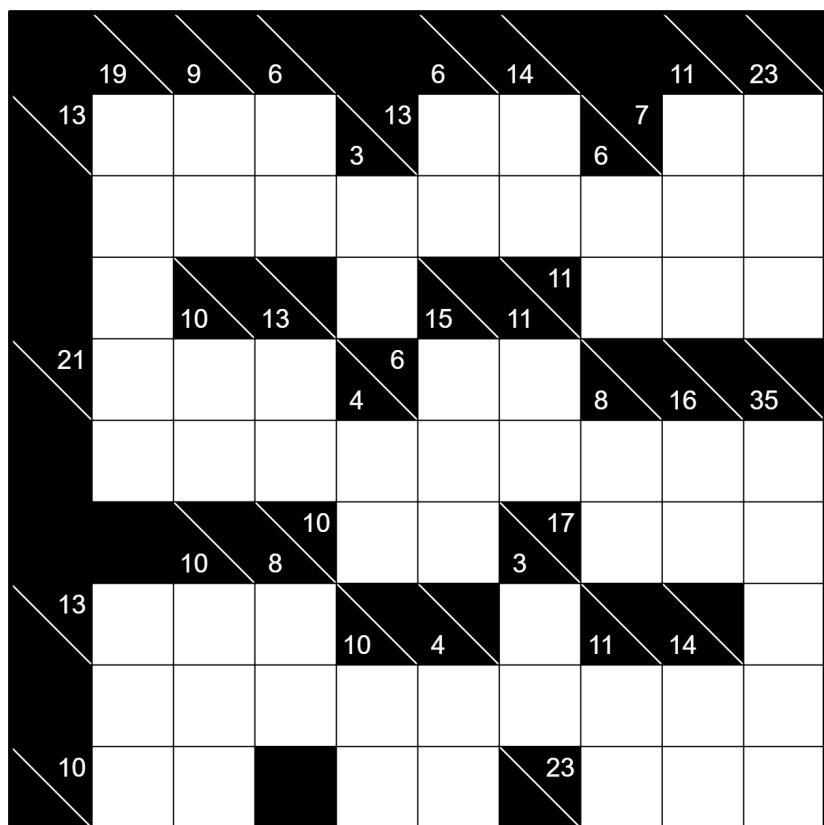
For example, R3C3 is the same as R7C7.

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

Puzzle 7 (by djmathman) 🌶️🌶️



Puzzle 8 (by djmathman)



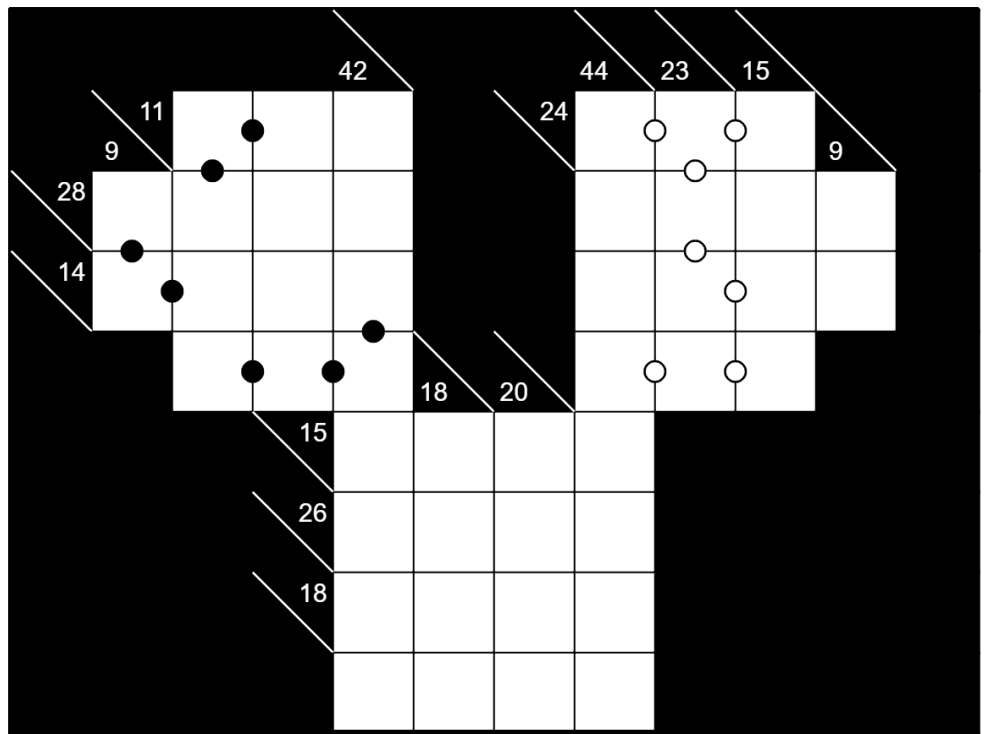
Puzzle 9 (by Kaz) 🌶️🌶️🌶️🌶️

Variant rules (Kropki)!

All pairs of numbers where one is double the other, are marked with a black dot.

All pairs of numbers that are one away from each other are marked with a white dot.

A 1,2 pair can be marked with either dot.



Puzzle 10 (by Freddie Hand) 🌶️🌶️🌶️🌶️🌶️

Variant rules (Kropki) again. This is the hardest puzzle I'll ever put on a handout.

Hint (Caesar shift by 13 to read): Ybbx ng bqq naq rira ahzoref va gur sbhegu pbyhza.

