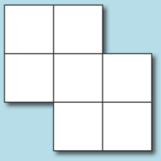
Kakuro



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INTRODUCTION

Kakuro is a problem from Japan. It is a little bit like the logic puzzle Sudoku. However, I think Kakuro is more interesting because the puzzle helps learners practice numeracy skills as well as helping them to think and working logically.

MATHEMATICAL CONTENT

- Number patterns
- Sequences

APPLICABILITY

KS2 – KS3

The basic rules of Kakuro are:

Rule 1 : You cannot repeat or use a number more than once in each calculation to make each answer.

Rule 2: You can only use numbers from 1 to 9 in each calculation.

To solve a Kakuro puzzle you are at an advantage if you know certain number facts. These facts are answers which have only one way (or one solution) of adding certain amount of DIFFERENT numbers together.

For example to make the answer 7using exactly three numbers we are not allowed any of these as solutions because numbers are repeated in each:

1+1+5 (or any rearrangement)
1+3+3 (or any rearrangement)
2+2+3 (or any rearrangement)

So, the only numbers that can be used are
1+2+4 or any rearrangement
(i.e. 1+4+2 or 2+1+4 or 2+4+1 or 4+1+2 or 4+2+1)

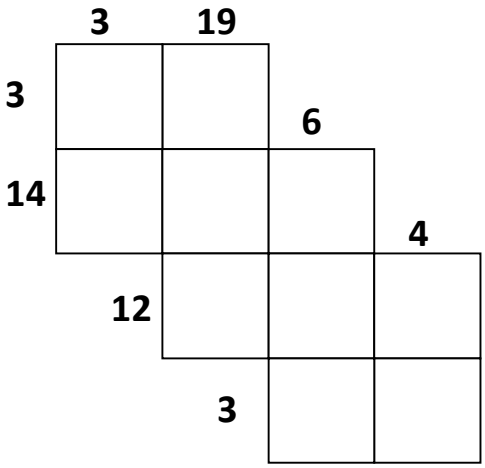
In the table on the next page see if you can fill in the correct calculations for answers which only have one solution (or any rearrangement of that solution) for a given amount of numbers.

Answer	Amount of numbers	A possible solution
3	Two	
4	Two	
16	Two	
17	Two	
6	Three	
7	Three	1 + 2 + 4 (or any rearrangement)
23	Three	
24	Three	
10	Four	
11	Four	
30	Four	
15	Five	
16	Five	
35	Five	
21	Six	
22	Six	
39	Six	
28	Seven	
29	Seven	
41	Seven	
42	Seven	
36	Eight	
43	Eight	
45	Nine	1+2+3+4+5+6+7+8+9

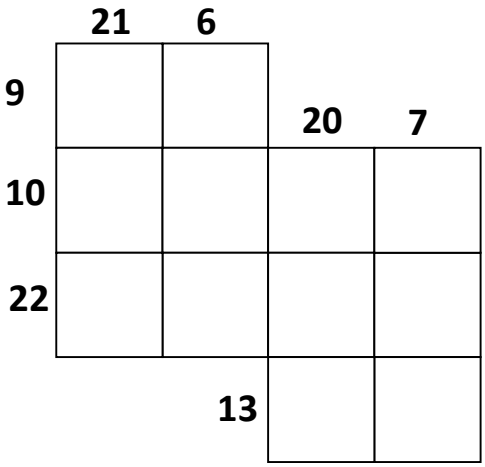
Here are a couple of puzzles to get you started:

The value at the top of a column is the total for that column↓.
The value on the left of a row is the total for that row→.

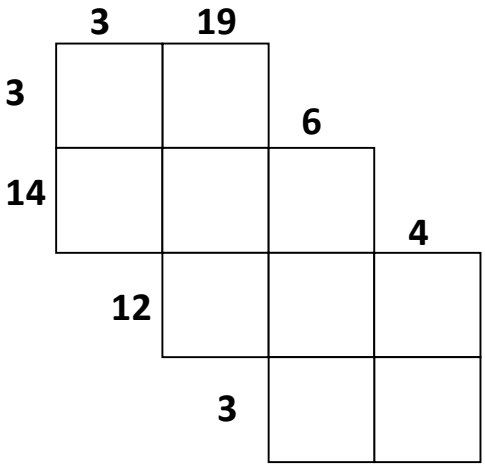
The idea is to fill in the grid using the numbers 1, 2, 3, 4, 5, 6, 7, 8 and 9 with the rule that no number can appear more than once for each row of in each column.
Using a pencil and having a rubber available is advised.

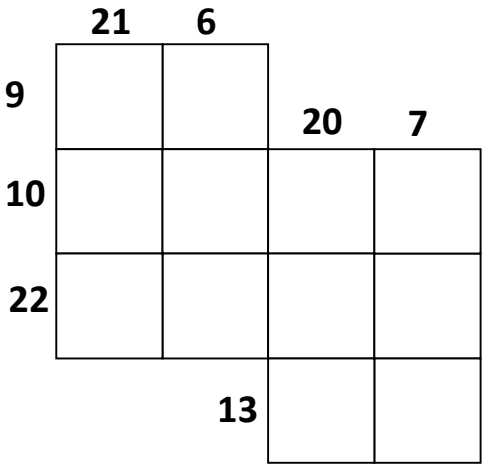


This next grid is a little more challenging.



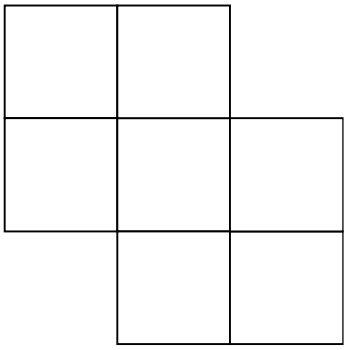
Just in case you used a pen on the last pair of grids!





Making your own Kakuro puzzles for another person to solve

Step 1 You can make your grid as simple or as complex as you like.
You just have to remember that every row and every column must have at least two spaces.

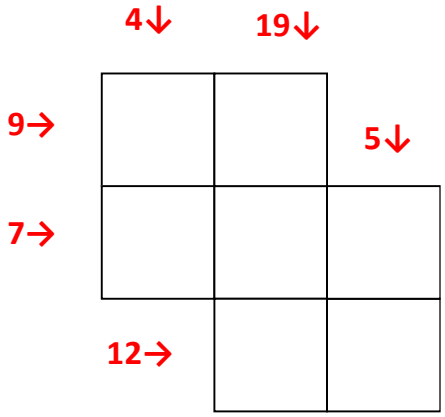


Step 2 Place single digit numbers (from 1 to 9 only) in the blank grid, e.g.

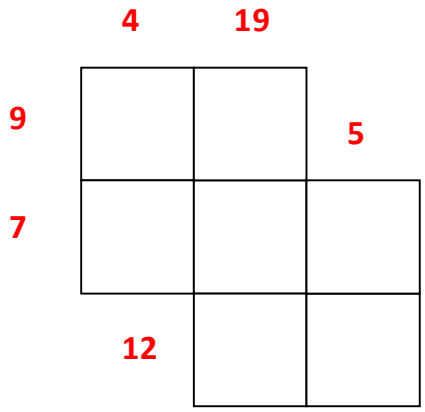
3	6	
1	4	2
	9	3

We are not allowed to repeat a digit in the same row or the same column but we can repeat the digits in a grid, e.g. the two 3s as above.

Step 3 Work out the totals for each row and each column.



Step 4 Give the other person the grid with your row and column totals



The other person has to try to work out what the numbers were inside the grid (i.e. those the first person originally used)

Remember numbers cannot be repeated in the same row or the same column

Blank grids