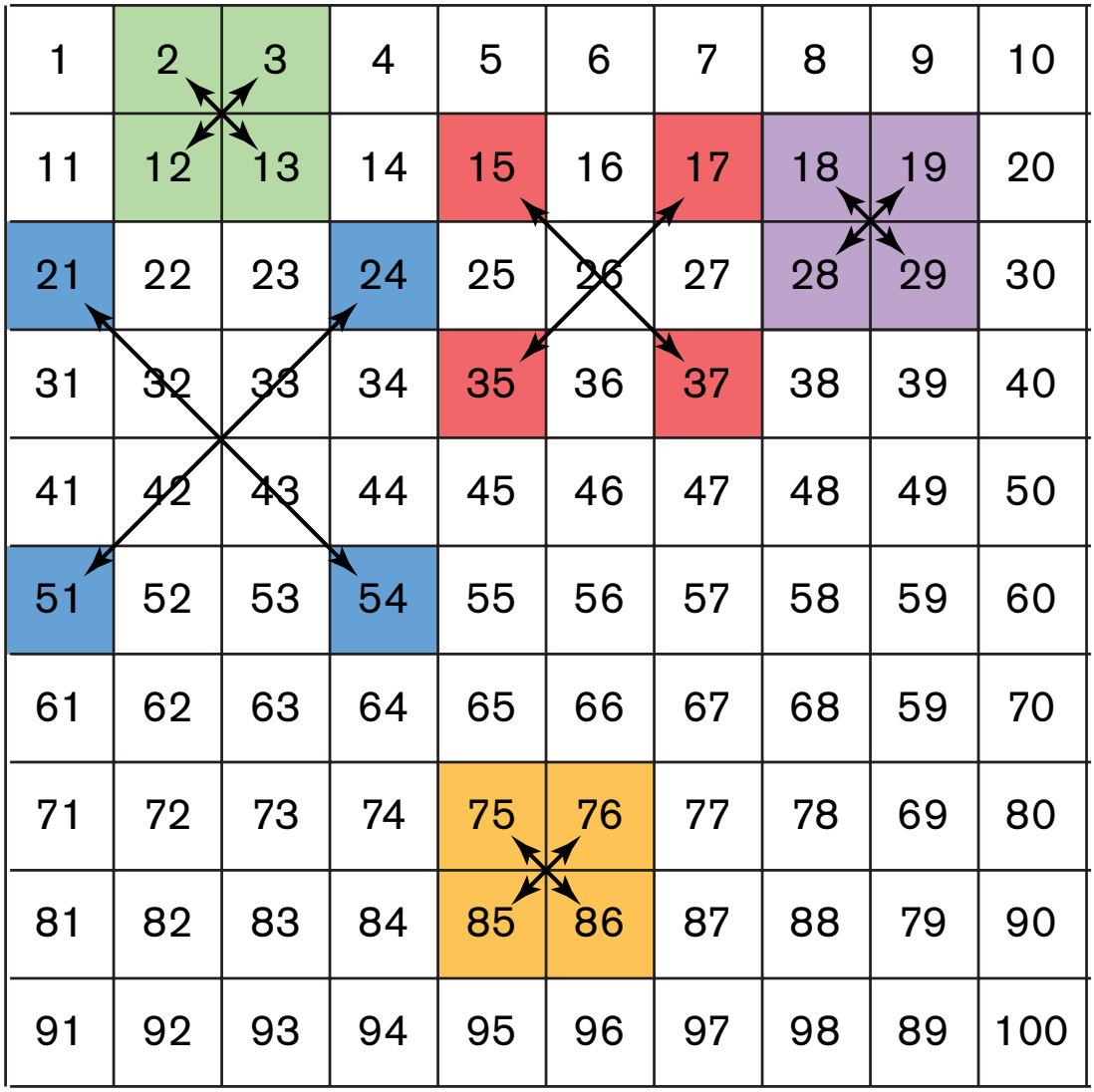
100-square

Problem sheet

Here is a 100-square with some of the numbers shaded.



1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	59	70
71	72	73	74	75	76	77	78	69	80
81	82	83	84	85	86	87	88	79	90
91	92	93	94	95	96	97	98	89	100

Look at the green square containing the numbers 2, 3, 12 and 13.

What is the sum of the numbers that are diagonally opposite each other? Do you notice anything?

Look at the purple square with the numbers 18, 19, 28 and 29. Does the same thing happen?

What about the yellow square with 75, 76, 85 and 86?

You could try with other squares that have four numbers in them.

Why does this happen?

Look at the squares shaded red (15, 17, 35 and 37). They form the corners of a large 3×3 square. If you add the numbers diagonally opposite each other, what happens? Why?

What happens with the square formed by the squares shaded blue (21, 24, 51 and 54)?

What happens for squares of different sizes? Why?