

A Prelude to Problem solving techniques.

Mysterious Magic Squares

The mathematics of magic squares have fascinated people for thousands of years. A Magic Square is a series of numbers arranged in a square so that the values in each row, each column and both diagonals add up to the same total that is one constant number, the so-called "magic constant." Magic squares are one of the simplest forms of logic puzzles, and a great introduction to problem solving techniques

But why are they called magic?

It seems that from ancient times they were connected with the supernatural and magical world. The earliest record of magic squares is from China in about 2200 BC. and is called "Lo-Shu". There's a legend that says that the Emperor Yu saw this magic square on the back of a divine tortoise in the Yellow River.

The 3x3 magic squares are the least complex form of magic squares one can solve.

Normal 5x5 magic squares have numbers from 1-25 and can be a real brain twister.

In today's session 3x3 and 5x5 magic squares were solved. The student members understood that this

arithmetical stunt is not difficult when the how of it is unravelled..

Shutterbugs

Math club members

VIII&IX

PSBB, Siruseri.

SESSION - II
MAGIC SQUARE
(3x3) & (5x5)

- Adding numbers horizontally, vertically, diagonally in a square and if the sum remains the same in all cases, it is called a magic square.
- The total sum in a line of magic square can be found by :

$$\text{Middle No.} \times \frac{\text{No. of squares}}{2}$$

* (3x3) Magic Squares

* STEP 1

LET'S DRAW FOR NUMBERS 1-9

DRAW EXTRA SQUARES AND ALIGN NUMBERS

* STEP 2

15	8	1	6	15
	3	5	7	15
	4	9	2	15
15	15	15	15	15

SUM IS 15
IN ALL CASES

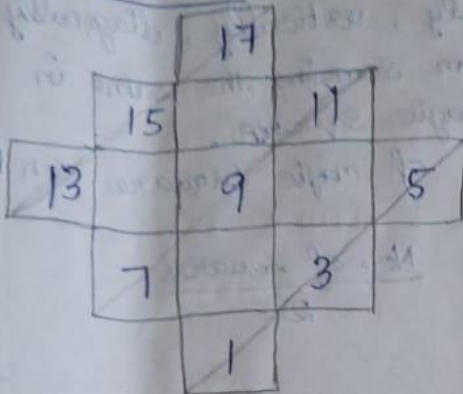
THE NUMBERS INSIDE THE SQUARE SHOULD BE LEFT AS IT IS. TRANPOSE THE OTHER NUMBERS OUTSIDE THE SQUARE.

MAGIC SQUARE READY!

• EXTRA SUMS (3x3)

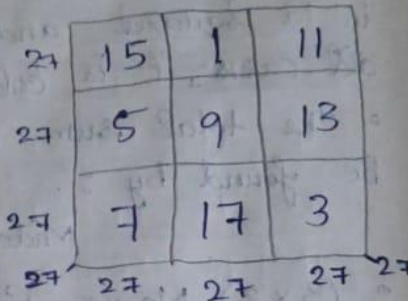
* 1, 3, 5 ... 17

STEP 1



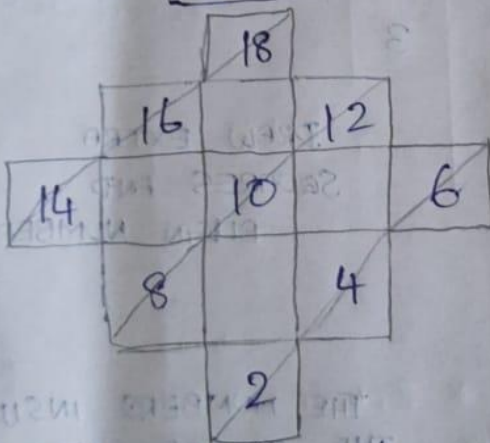
SUM = 27

STEP 2



* 2, 4, 6, 8 ... 18

STEP 1



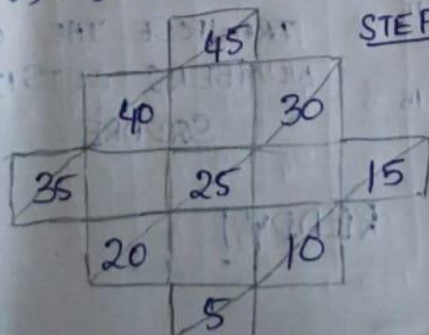
SUM = 30

STEP 2



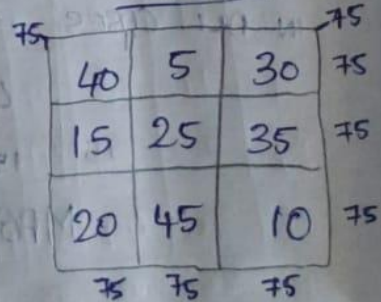
* 5, 10, 15, 20 ... 45

STEP 1



SUM = 75

STEP 2



• (5x5) MAGIC SQUARES

* TIPS :

+ Always move in North-East Direction (↗)

* LET'S DO FOR NUMBERS (1-25).

17	24	1	8	15
23	5	7	14	16
4	6	13	20	22
10	12	19	21	3
11	18	25	2	9

NO. 1 SHOULD BE IN THE MIDDLE BOX OF 1ST ROW. THEN CONTINUE MOVING.

65	17	24	1	8	15	65
	23	5	7	14	16	65
	4	6	13	20	22	65
	10	12	19	21	3	65
	11	18	25	2	9	65
65	65	65	65	65	65	

YOU GET FINALLY LIKE THIS.

SUM = 65

• EXTRA SUMS (5x5)

* 1, 3, 5, ..., 49

SUM = 125

125	33	47	1	15	29	125
	45	9	13	27	31	125
	7	11	25	39	43	125
	19	23	37	41	5	125
	21	35	49	3	17	125
125	125	125	125	125	125	

SUM = 130

* 2, 4, 6, ..., 50

130	34	48	2	16	30	130
	46	10	14	28	32	130
	8	12	26	40	44	130
	20	24	38	42	6	130
	22	36	50	4	18	130
130	130	130	130	130	130	

* 5, 10, 15, 20... .. 125

85	70	5	40	75	325
115	25	35	70	80	325
20	30	65	100	110	325
50	60	95	105	15	325
55	90	125	10	45	325
325	325	325	325	325	325

SUM = 325

13, 5

13	5
11	7
9	9
7	11
5	13

13, 5, 11, 7, 9, 9, 7, 5

13	5	11	7
9	9	7	11
7	11	9	5
5	13	7	11

(5x5) → Non-magic?

17	24	13	15	17
23	5	7	11	6
4	6	13	20	7
10	12	18	1	3
11	18	25	0	9

65 65 65 65 65

1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25

17, 21, 1, 8, 15 = 62 (1-25)

23, 5, 7, 11, 16 = 62

4, 10, 15, 20, 22 = 65

19, 12, 14, 21, 23 = 69

11, 18, 25, 2, 19 = 65

6 = 65 - 65 = 0

1) 8, 12, 1, 15, 14

4, 5, 9, 13, 22, 31

7, 11, 28, 39, 43

19, 23, 32, 41, 5

21, 35, 44, 13, 17 =

25, 15, 12, 5 = 65

2) 34, 44, 2, 16, 30, 130

46, 10, 14, 29, 34, 130

8, 12, 26, 40, 44, 130

20, 24, 38, 42, 6, 130

22, 36, 50, 4, 18, 130

30, 34, 12, 16, 130

3) 85, 120, 5, 90, 125

115, 25, 35, 70, 80

20, 30, 65, 100, 110

50, 60, 95, 105, 15

55, 90, 125, 10, 45

46	5	31	25
26	25	35	25
24	45	18	25
31	25	24	25

