

# RAM Maths Circle

December 22, 2024

Nagpur

In today's session, we celebrated National Mathematics Day by exploring Srinivasa Ramanujan's Birthday Magic Square. Students learned the concept of a magic square, made observations about its properties, and gained insight into its mathematical beauty. Students also created their own magic square, and solved an engaging grid puzzle.

22	12	18	87
88	17	9	25
10	24	89	16
19	86	23	11

## Questions

1. A  $3 \times 3$  grid needs to be filled with the numbers 1 to 9 such that the resulting grid forms a magic square. A magic square is a grid where the sum of every row, column, and diagonal is the same. Determine the arrangement of the numbers to create a valid magic square.
2. The numbers 1 through 16 are placed in the boxes of a  $4 \times 4$  table as shown in Figure (a). It is permitted to:
  - Increase all the numbers in any row by 1, or
  - Decrease all the numbers in any column by 1.

Is it possible to obtain the table shown in (b) using these operations? Justify your answer.

1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16

(a)

1	5	9	13
2	6	10	14
3	7	11	15
4	8	12	16

(b)