

NEWS

MAGIC SQUARE FOR 2005

The article published in the IJHS, 39.1 (2004) 143-144 has informed that in the early 14th century, in a city called Patrapunjanagar in the region of Naimisa (near the modern Sitapur in the state of Uttar Pradesh), Harṣa composed the tract *Ankayantra Cintāmaṇi* which roughly translates to 'Magic Squares that are effective like wish fulfilling gems'. In the said article squares of the order of four only have been mentioned. The writer is unaware of any historical details or historicity of any other Magic Squares*.

The Magic Squares of the order of 3,5,7 and so on were shown to me by one of my colleagues about 30 years back. Making suitable alterations the required square is made suitable for 2005. After studying the said magic square some principles of formulations of the square were observed. In Sanskrit the Magic Square is called *Ankayantra* or *Srvato Bhadra Yantra*, a diagram that is symmetrical on all sides and is, therefore, auspicious in all respects.

In this magic square the sum of all the five numbers in any horizontal row, in any vertical column or in each of the two diagonals is always 2005. Following principles are observed for formulation of such squares:

1. If we have to prepare a square of the order of 5 with constant sum of 2005, the number in the central cell must be $2005/5 = 401$.
2. The first number out of consecutive 25 numbers, will be $401-12=389$ and the last number will be $401+12 = 413$ (Array I). If alternate consecutive numbers are taken, the first number will be $401-24 = 377$ and the last number will be $401+24 = 425$ (Array II) and so on. In another Array III, having interval of 33, the smallest number will be $401-396 = 5$ and the biggest number will be $401+396 = 797$.
3. Begin the placing of number from the central cell of topmost row.
4. Every consecutive next number will be in the adjacent column to the

* For details on "Magic Squares in India" by B.B. Datta and A. N. Singh, revised by K. S. Shukla, vide *IJHS*, 27.1 (1992) 51-120 - Editor

right side and the upper row. If there is no upper row, it will come in the bottom most row but in the adjacent column to the right side. Similarly if there is no column to the right side, the next number will come in the first column from the left side, but in the upper row.

5. If the cell in the next column to the right side and in the upper row is already filled in, next number will come in the same column below the previous number but in the lower row. As regard the number in the top most row and right most column where there is no further column to the right side or further upper row, the next number will come in the same right most column below the previous number.
6. The sum of the numbers in the 1st and 25th cells will always be 802, in the 2nd and 24th cells the sum will also be 802 and so on.
7. If the entire column no. 1 is exchanged to column no 5 the sum of the columns and rows and also of diagonals will not be affected. Similarly if entire column no. 2 is exchanged to column no 4, the sum will not be affected. Similarly if the entire rows no. 1 and 2 are exchanged respectively to rows no. 5 and 4 the sum will remain unaffected.

Magic Squares of the order of 5 with magic constant 2005 for the New Year 2005 are given below :

I

405	412	389	396	403
411	393	395	402	404
392	394	401	408	410
398	400	407	409	391
399	406	413	390	397

II

409	423	377	391	405
421	385	389	403	407
383	387	401	415	419
395	399	413	417	381
397	411	425	397	393

III

533	764	005	236	467
731	137	203	434	500
104	170	401	632	698
302	368	599	665	071
335	566	797	038	269

IV

413	398	409	394	391
395	405	399	400	406
390	392	401	410	412
396	402	403	397	407
411	408	393	404	389

In the Array marked IV above, some principles are relaxed (3,4,5). Finding a method for formulation of such magic square is a subject matter of the writer's research. It is found that innumerable number of such squares can be formulated.

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INDIAN CONTRIBUTION TO WORLD CIVILISATION

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