

RAM maths circle - nashik

BHAS BHAMRE ACADEMY

Session-1

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Introduction

The session started with simple problems on LCM, HCF, Diophantine equations, magic squares, and digital roots of numbers.

1) LCM and HCF

- 1) Find the LCM of 18 and 343.
- 2) Find the LCM of 13 and 133.
- 3) Find the HCF of 14 and 91.
- 4) There are three numbers such that:
 - (a) The HCF and LCM of the first two numbers are 7 and 10010 respectively.
 - (b) The HCF and LCM of the second and third numbers are 11 and 15015 respectively.
 - (c) The HCF and LCM of the first and third numbers are 5 and 2310 respectively.

Find these three numbers.

2) Diophantine Equation

If $a = 12D + 31M$, where D denotes the date and M denotes the month, find D and M .

- 5) When $a = 260$.
- 6) When $a = 396$.
- 7) Investigate whether two different dates can have the same value of a .

3) Magic Squares

- 8) What is a magic square?
- 9) How can one construct a 3×3 magic square?
- 10) What is the magic constant of a magic square?
- 11) Construct a 3×3 magic square with magic constant 30.
- 12) What is a Ramanujan square?

4) Digital Roots

Introduction to digital roots of numbers and their applications in quick arithmetic checks.

- 13) Find all possible values of the digital root of a square of any positive integer.
- 14) Find all possible values of the digital root of a cube of any positive integer.
- 15) Find all possible values of the digital root of the sixth power of any positive integer.
- 16) Using the units digit and digital root, formulate divisibility rules for: 2, 3, 5, 6, and 9.

