RAM Maths Circle

Inaugural Session Report

Delhi Public School, Nashik

Introduction

The Nashik Maths Circle held its inauguration from 4:30 to 5:30 pm, followed by the first official session. After that, from 5:30 to 6:30 pm, Bhas Bhamre sir — a math educator with a clear love for geometry and number theory — led a lecture that mixed problem-solving with small discussions, plus a quick snack break somewhere in the middle.

Problem 1: Large Number Comparison

The session opened with a deceptively heavy-looking multiplication question:
Which is greater:

$$3,33,33,33,33,333 \times 4,44,44,44,44,444$$

or

$$2,22,22,22,22,222 \times 6,66,66,66,66,667?$$

Instead of brute force, we simplified using $x = 1,11,11,11,11,111$ for the large repeating-number forms, which made the comparison far more manageable.

Problem 2: GCD and Number Theory

The second problem shifted into number theory: five positive integers whose pairwise GCD is always more than 1, but the GCD of all five together drops to 1. After laying down two useful observations — none of the numbers can be prime, and none can be a prime power — the group eventually reached one of the smallest possible valid sets: $\{6,6,6,10,15\}$.

Exploration and Group Theory

Problems 3, 4, and 5 were exploratory and left to students to think through on their own.

The exploration segment was on symmetries of a square, moving into the territory of group theory. Students played with identity, rotations, and reflections, checked how these transformations behave when applied one after another, and built a multiplication table. They also had to examine which properties (associativity, commutativity) hold and which don't.

Homework

To wrap up, the session ended with a few PODASIP (Prove or Disprove And Salvage If Possible) homework questions.