

# Nashik Maths Circle

January 31, 2026

Delhi Public School, Nashik

## Session Overview

The Nashik Maths Circle session on January 31st was conducted by Mr. Prasanna Bhole. The session featured a diverse "mixed bag" of mathematical challenges designed to push students beyond rote memorization and toward genuine logical inquiry.

## Interdisciplinary Mathematical Challenges

The problem set spanned multiple disciplines, requiring students to pivot between different modes of mathematical thinking:

- **Geometry:** Problems involving spatial reasoning and properties of shapes that prioritized visualization over calculation.
- **Algebraic Reasoning:** Questions that required students to identify relationships and structures rather than simply solving for variables.
- **Number Theory:** Challenges focused on the intrinsic properties of integers and patterns within number sequences.

## Philosophy of the Session: Logic Over Formulae

A key theme of Mr. Prasanna's session was the rejection of "thoughtless" formula application. The problems were specifically curated to ensure that:

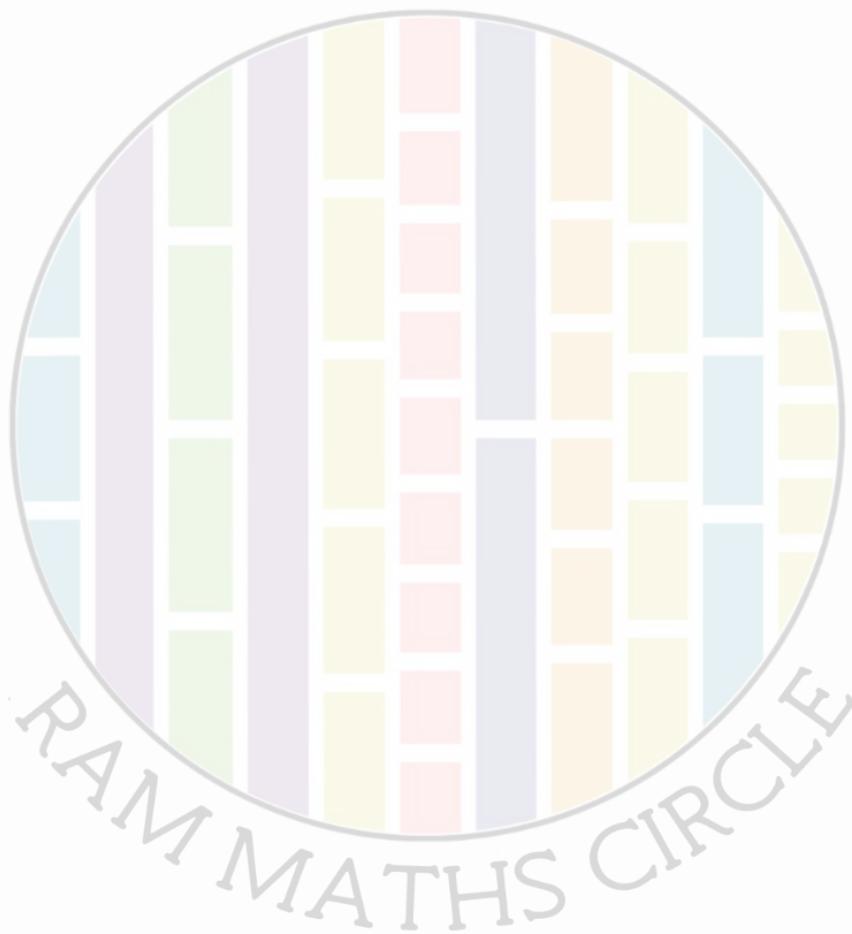
- Standard formulae would often lead to dead ends or overly complex calculations.
- Success was found through **critical thinking** and **first-principles reasoning**.
- Students were encouraged to "see" the problem before attempting to compute the answer.

## Student Engagement

The students responded with great enthusiasm to this non-traditional approach. By stripping away the "safety net" of memorized equations, the session forced a deeper engagement with the core logic of each problem.

## Conclusion

The session was highly productive, serving as a reminder that mathematics is primarily a tool for logical exploration. Students left with a sharpened ability to approach unfamiliar problems with confidence and a critical eye.



## NASHIK MATHEMATICS CIRCLE

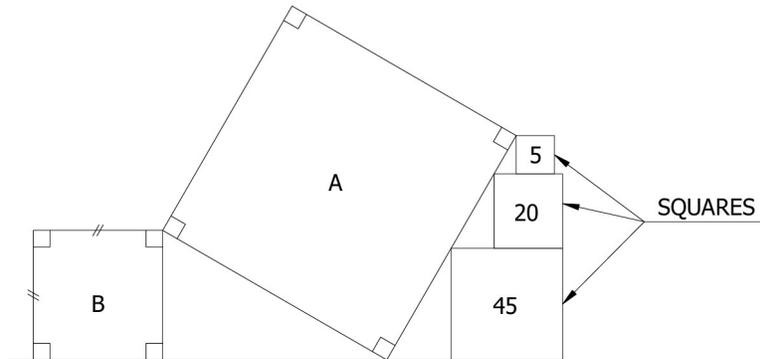
Date: 31 Jan 2026

Prasanna Bhore, pmbhore@gmail.com

**P-1:** If  $f(n) = 1! \times 2! \times 3! \times \dots \times n!$

Find  $m$  such that  $\frac{f(100)}{m!}$  is a square.

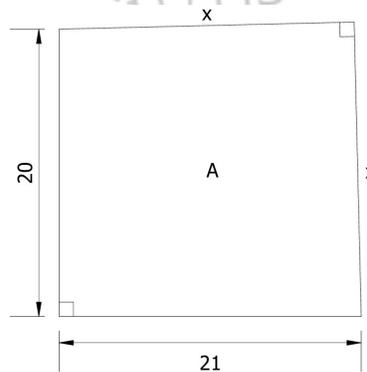
**P-2:** Find A (area of square). Also find B (Figure not to scale)



**P-3:** At what time between 2&3 does the hour hand and minute hand overlap? At what time(s) the angle between hour & minute hand is  $25^\circ$  ?

**P-4:** simplify  $(0.01)^{-5} \times (0.0001)^{5/4} \times (0.01)^{4/3} \div (100)^{-1/2}$

**P-5:** Find size of square with area A.



**P-6:** Perimeter of a rhombus is 116 units. Find its area if both the diagonals are integers.

**P-7:** If  $a$  &  $b$  &  $c$  is a Pythagorean triplet prove that

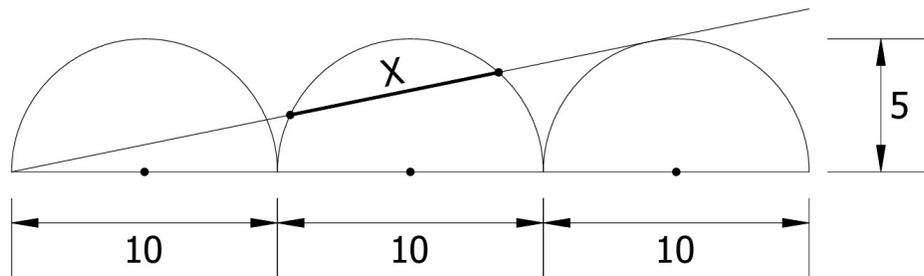
$$(ab)^4 + (bc)^4 + (ac)^4 = \left(\frac{a^4 + b^4 + c^4}{2}\right)^2 = \frac{1}{2}(a^8 + b^8 + c^8)$$

**P-8:** If  $a + b + c = 0$  &  $ab + bc + ac = -11$ , Find  $a^4 + b^4 + c^4$  (a, b, c are real numbers)

**P-9:** If  $\frac{1}{a} + \frac{1}{b+c} = \frac{1}{x}$ ,  $\frac{1}{b} + \frac{1}{a+c} = \frac{1}{y}$ , and  $\frac{1}{c} + \frac{1}{a+b} = \frac{1}{z}$  Find x, y & z in terms of a, b & c in simplified form. Also find a, b & c in terms of x, y & z

**P-10:** Try finding a set of four numbers such that sum of all numbers in the set is equal to product of all the numbers. Find two such sets. Try to develop a method to find a number series where sum of first n numbers equals the product of those n numbers.

**P-11:** Find x.



**FUN:** What is the minimum size of square hole in a paper to let a 27mm dia coin (Rs.10/- coin) pass through that hole. (Hint – paper is allowed to be folded)

