# Nashik Maths Circle

February 14, 2026

Delhi Public School, Nashik

## Session Overview

The Nashik Maths Circle session on February 14th was conducted by Mr. Akash Dhanokar. This session was designed as a solving-intensive workshop, focusing on fundamental Number Theory and the comparison of complex mathematical expressions.

## Curriculum and Problem Design

The problem set was curated to move beyond standard textbook exercises, focusing instead on deep, foundational concepts. The session was characterized by:

- **Fundamental Number Theory:** Problems that challenged students to apply basic properties of integers in non-trivial ways.
- **Complex Comparisons:** The opening challenge required students to compare the values of various mathematical expressions. These were designed to be counter-intuitive, requiring logical manipulation rather than direct calculation.
- **Active Solving:** The session emphasized the process of discovery, with students working through the problem sheet under the guidance of the faculty.

## Mentorship and Guidance

To support the students through these rigorous challenges, a strong team of mentors was present. Akash sir, along with other faculty members and Teaching Assistants (TAs), provided:

- Scaffolding for students struggling with new concepts.
- Direct guidance on how to break down complex expressions for comparison.
- Discussion on the logic behind the "first principles" of Number Theory.

## Conclusion

The session was highly productive, providing students with a rare opportunity to engage with "not normal" problems that test the limits of their logical reasoning. By focusing on the most fundamental concepts, the session built a stronger base for the students' future mathematical explorations.

Raising a Mathematician Foundation

Nashik Mathematics Circle

Date – 13th February 2026

Akash Dhanokar, akashdhanokar7@gmail.com

1. Which is greatest ?

| | | | | |
|---|---|---|---|---|
| 2222 | 22^22 | 22^22 | 2^2222 | 2^22^2 |
| 222^2 | 2^222 | 22^2^2 | 2^2^22 | 2^2^2^2 |

2. Four teams W, X, Y and Z play a round-robin tournament (each team plays every other team once).

- Win = 2 points, Draw = 1 point, Loss = 0 points.
- Final points: W = 5, X = 3, Y = 2, Z = 2.
- Exactly two matches ended in a draw.
- W drew exactly one match.
- Z did not win any match.

1. Which match did W draw?
2. Which team defeated Z?
3. Did X defeat Y?
4. How many matches did Z lose?



3. Working modulo 9 or 11, find the missing digits in the calculations below:

(a) 51840 * 273581 = 1418243A040
(b) 2B99561 = [3(523 + B)]2
(c) 2784C = C • 5569
(d) 512 • 1D53125 = 1000000000

4. An old and somewhat illegible invoice shows that 72 canned hams were purchased for "x67.9y" . Find the missing digits.

4. Six products – U, V, W, X, Y and Z – are to be placed in the display window of a vending machine with six compartments, numbered 1 through 6 from left to right. The products must be placed in the window, one product in each compartment, according to the following conditions:

U cannot be immediately to the left or immediately to the right of V
W must be immediately to the left of X
Z cannot be in compartment 6

[A] Which of the following products CANNOT be placed in compartment 1?
(a) U (b) V (c) W (d) X

[B] If X is placed in compartment 3, W must be placed in compartment
(a) 1 (b) 2 (c) 4 (d) 5

[C] If U is placed in compartment 5, which of the following products must be placed in compartment 6?
(a) V (b) W (c) X (d) Y

[D] If Z is placed in compartment 3, immediately to the right of X, which of the following products must be placed in compartment 5?
(a) Y (b) V (c) W (d) X

5. Sum of three *Natural* numbers a, b and c is 10. How many ordered triplets (a, b, c) exist?

6. Sum of three *Whole* numbers a, b and c is 10. How many ordered triplets (a, b, c) exist?

7. Each of the N students in a school took part in at least one of the following three quiz events:

Science Quiz (S)
Math Quiz (M)
Literature Quiz (L)

The following participation details are known:
30 students participated in the Science Quiz.
28 students participated in the Math Quiz.
44 students participated in the Literature Quiz.

(a) It is also known that 49 students participated in exactly one of the three events. What is the maximum possible number of students who could have participated in exactly two of the events?

(b) If the number of students who participated in exactly one event is greater than or equal to the number of students who participated in exactly two events, and that, in turn, is greater than or equal to the number of students who participated in all three events, what is the maximum possible number of students who took part in all three quiz events?
(A) 17 (B) 16 (C) 18 (D) 19

(c) If the number of students who participated in at least two events is 29. Find the minimum possible total number of students.

(d) If 10 students participated in all three events and 20 students participated in exactly two events, how many students took part in only one of the events?
(A) 44 (B) 32 (C) 54 (D) Cannot be determined

(e) If 15 students participated only in the Math Quiz, and 7 students participated in both Math and Literature but not in Science, what is the maximum possible number of students who could have participated in all three quizzes?
(A) 11 (B) 6 (C) 12 (D) 8