Nashik Maths Circle

January 24, 2026

Delhi Public School, Nashik

Session Overview

The Nashik Maths Circle session on January 24th was led by Mr. Omkar Sambare. The primary objective of the session was to introduce students to the foundational principles of enumerative combinatorics through an active, problem-solving framework.

Combinatorics: Permutations and Combinations

The core of the session focused on developing an intuitive understanding of permutations and combinations. Rather than starting with formulas, students explored:

- **Counting Problems:** Using specific scenarios to understand how different arrangements and selections are formed.
- **Fundamental Principles:** Learning the "Product Rule" and "Sum Rule" through guided challenges.
- **Algebraic Transition:** Moving from manual counting to symbolic representation.

Specialized Problem Sets

In addition to standard counting exercises, the session integrated various mathematical puzzles to broaden the students' perspective:

- **Chessboard-Based Challenges:** Problems involving pieces, paths, or squares on an 8×8 grid to visualize combinatorial growth.
- **Logical Puzzles:** Multi-step questions designed to test the limits of basic counting logic.

The Power of Generalization

A significant portion of the session was dedicated to the concept of mathematical generalization. Students were encouraged not just to solve the specific problem in front of them, but to:

- Identify patterns that persist across different versions of a problem.
- Formulate "general solutions" (formulas or algorithms) that could be applied to any similar problem regardless of the variables involved.

Conclusion

The session was highly impactful, providing students with the tools to handle complex counting tasks with confidence. By emphasizing generalization over rote calculation, it fostered a deeper appreciation for the elegance of combinatorial structures.

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Raising A Mathematician Foundation™

Nashik Mathematics Circle

Date: 24th Jan 2026

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1) If we put 2 rooks on a chessboard randomly, what is a Probability such that 2 rooks are attacking each other?

2) If we put 2 rooks on a $(m \times n)$ chessboard randomly, what is a Probability such that 2 rooks are attacking each other?

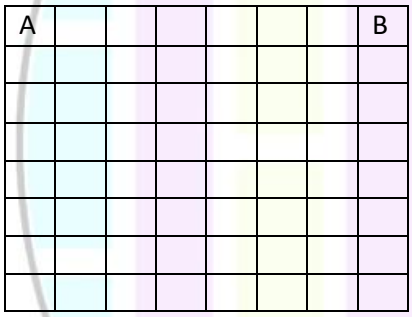
3) If we put 2 Bishops on a chessboard randomly, what is a Probability such that 2 bishops are attacking each other?

4) If we put 2 Bishops on a $(m \times n)$ chessboard randomly, what is a Probability such that 2 bishops are attacking each other?

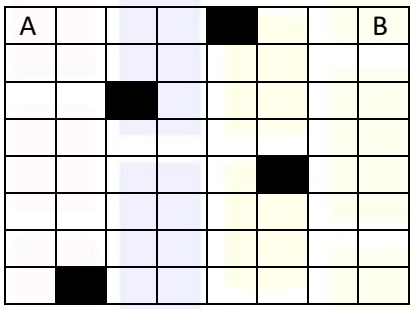
A-3 Explore above problems for other chess pieces.

5) In how ways we can reach of Point A to Point B in minimum number of steps in following Diagrams : (Movement is allowed only horizontally or vertically or diagonally, Black squares are restricted).

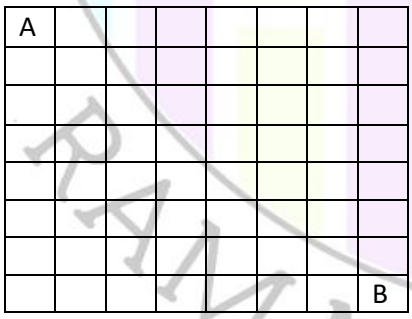
i)



ii)



iii) [only horizontal or vertical moves allowed for iii)]



7) Solve the following (each letter is a digit): ABCDEF × 3 = BCDEFA

8) Find Value of x: $\frac{x}{24} + \frac{x}{104} + \frac{x}{234} + \frac{x}{414} + \frac{x}{644} + \frac{x}{924} + \frac{x}{1254} = 49$

Reference: CMI Entrance exams, NMTC, mathsisfun.