Raising A Mathematician Foundation®

RAM TP 2024 REPORT

May 15 to 21, 2024

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Raising A Mathematician Training Program (RAM TP)

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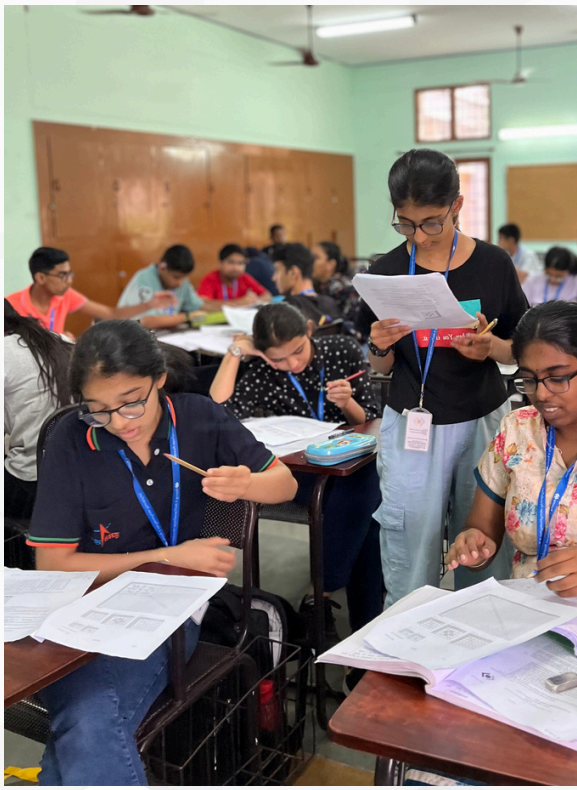


INTRODUCTION

The residential summer camp, RAM TP 2024, organized by Raising A Mathematician Foundation was a highly successful event. RAM TP aimed at providing a platform for young mathematics enthusiasts to delve into the fascinating world of mathematics and was a resounding success. The camp was held from May 15th to 21st 2024 and it brought together talented students from all over the country across cities, towns, villages and different states. The camp fostered an environment of learning, collaboration, and intellectual growth, covering a wide range of topics with expert faculty members.

DETAILED REPORT

Raising A Mathematician Training Program 2024

OBJECTIVE

RAM TP aims to create an immersive learning environment that fosters a deep appreciation and love for mathematics among its participants. By bringing together students from diverse backgrounds and regions, the camp provides a platform to explore challenging mathematical concepts, engage in problem-solving, and collaborate with like-minded peers. RAM TP's objective is to identify and mentor mathematically inclined school students. The primary goal of the camp is to kindle the participants' passion for mathematics and cultivate critical thinking skills. Through mentorship, interactive sessions, and hands-on activities, the camp empowers these young talents, encouraging them to pursue further studies and research in the field of mathematics. Ultimately, RAM TP seeks to inspire and nurture the students, fostering a future generation of leaders and innovators in the realm of mathematical exploration.

SELECTION PROCEDURE

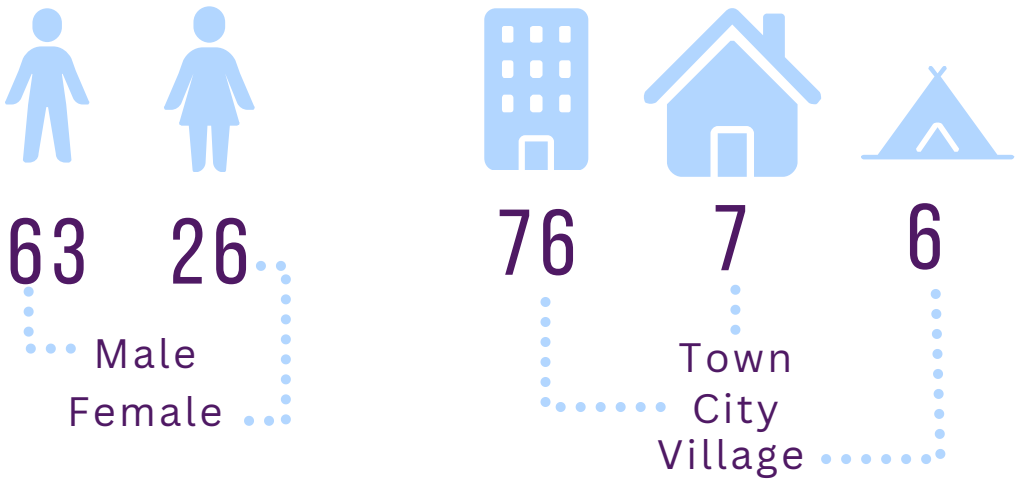
RAM TP 2024 received an overwhelming response, with applications pouring in from all over India. After a rigorous selection process, 89 participants were invited to attend the residential camp. The selection procedure involved a thorough assessment of the Students' Application Form and Teacher's Recommendation letter, evaluating each applicant's passion for mathematics and their aspirations.

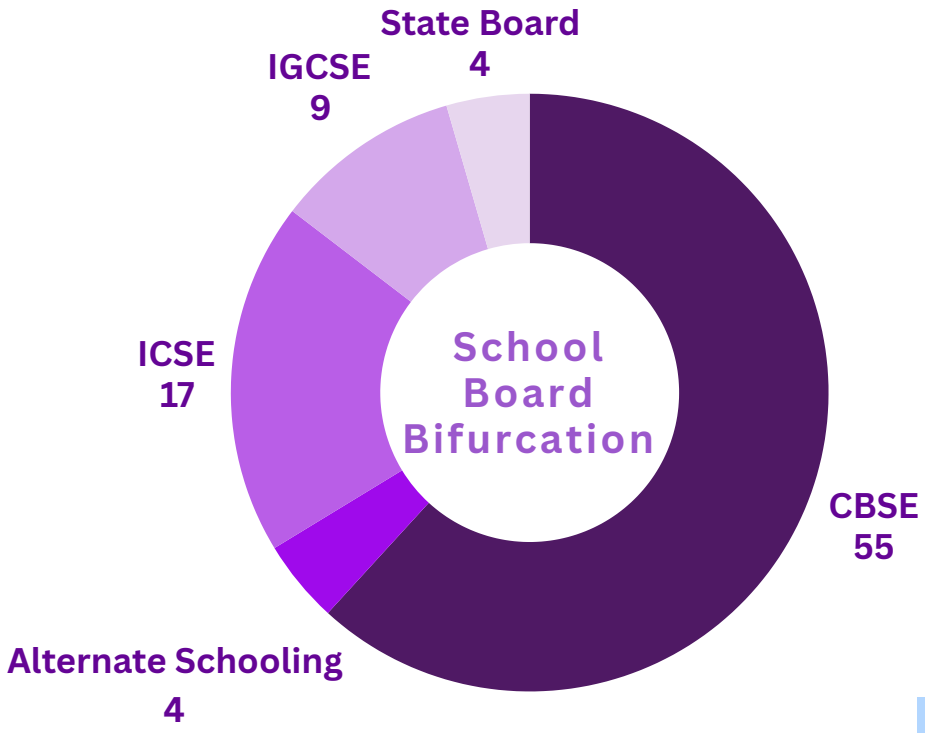
KEY HIGHLIGHTS

PARTICIPATION

RAM TP 2024 witnessed enthusiastic participation from 89 students representing diverse ethnicities, academic and cultural backgrounds.

STUDENT DIVERSITY





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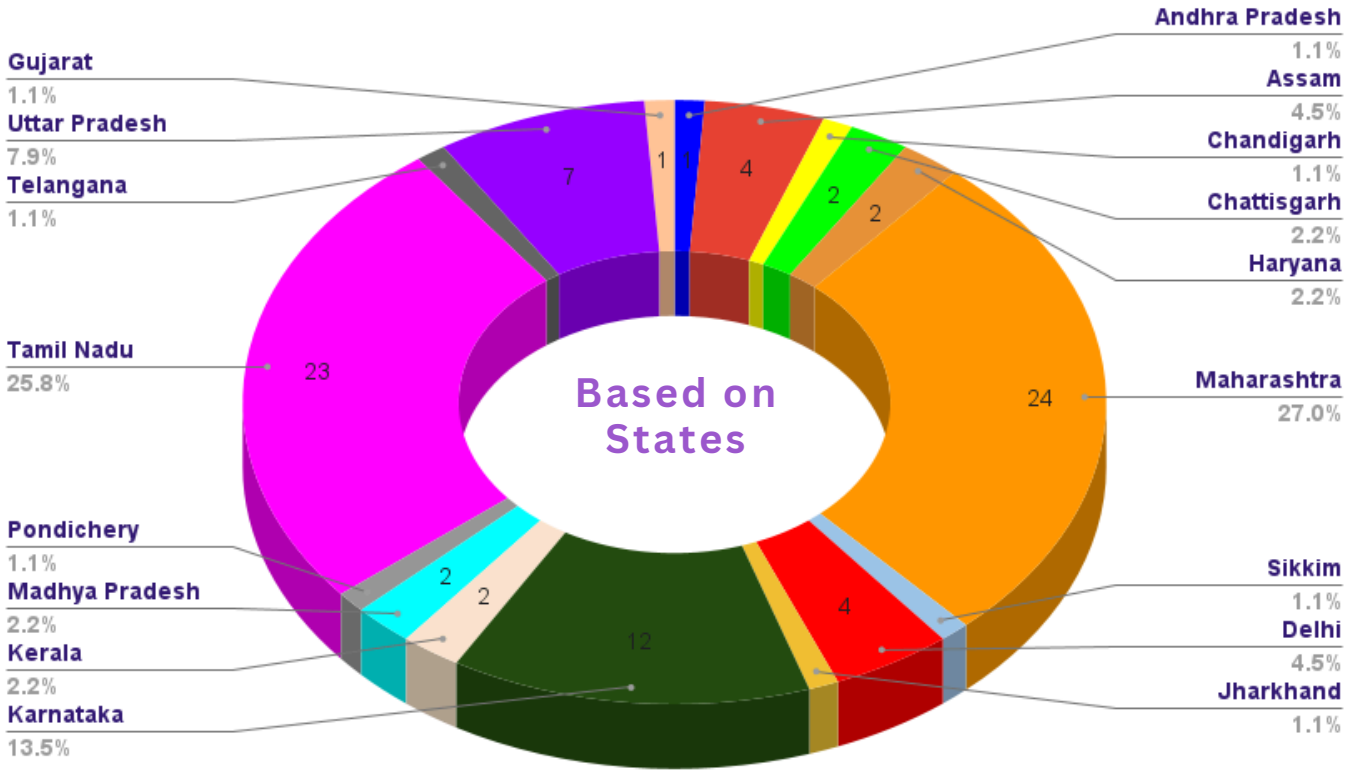
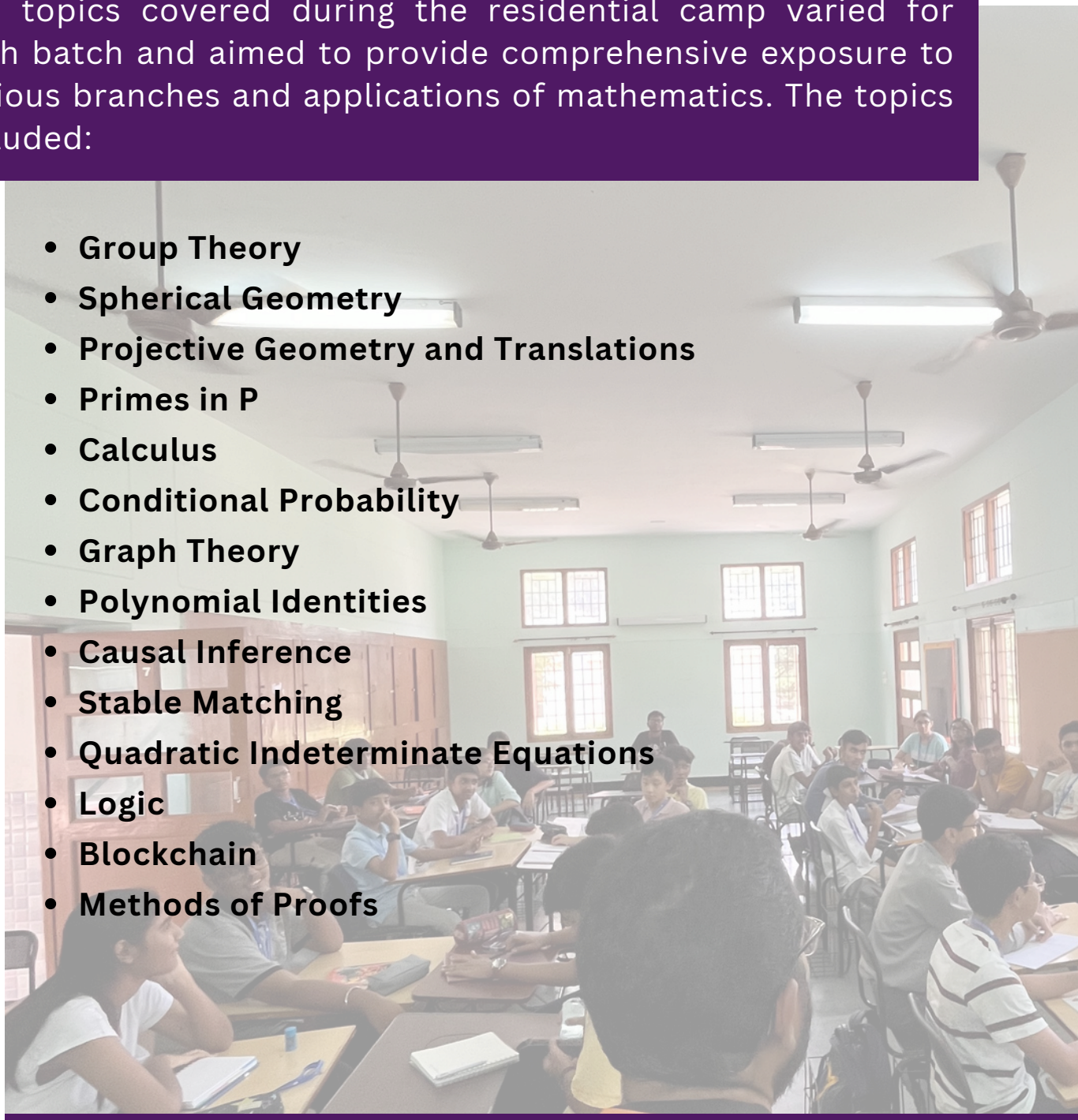


PEDAGOGY AND PROGRAM SCHEDULE

RAM TP 2024 was conducted as a residential camp at Chinmaya International Residential School (CIRS), Coimbatore. The participants were divided into four batches - A, B, C, and D, with Batch D consisting of returning students. Each day at RAM TP started at 7 am with a unique chanting session from the Upanishads, providing an opportunity for students to center themselves and mentally prepare for the day ahead. The camp's pedagogy focused on offering the highly abled children a peek into the diverse universe of Mathematics, an experience vastly different from the school mathematics. The in-house faculty were facilitators of hourly high energy interactive sessions, aimed at fostering inquiry, exploration and discovery. The guest lectures complemented these sessions and it gave them access to Math professors from universities within and outside India. The sessions went on till 7:30 PM and the students' enthusiasm for learning never dimmed. The informal sessions post dinner motivated them more into the world of Mathematics. The camp empowered the students to shape their own mathematical journey by letting them dip their toes into a world, which would not be accessible to them otherwise. RAM TP 2024 continued its pioneering effort to foster, nurture and inspire the young mathematicians of India.

TOPICS EXPLORED

The topics covered during the residential camp varied for each batch and aimed to provide comprehensive exposure to various branches and applications of mathematics. The topics included:



- **Group Theory**
- **Spherical Geometry**
- **Projective Geometry and Translations**
- **Primes in P**
- **Calculus**
- **Conditional Probability**
- **Graph Theory**
- **Polynomial Identities**
- **Causal Inference**
- **Stable Matching**
- **Quadratic Indeterminate Equations**
- **Logic**
- **Blockchain**
- **Methods of Proofs**

The topics mentioned above were tailored to suit each batch, reflecting the diverse range of mathematical concepts covered during the residential camp. Depth and Breadth of each topic varied based on the specific batch.

PRE-CAMP

Before the residential camp, students actively prepared themselves by engaging with meticulously crafted preparatory notes provided by the academic team of the camp and completing assignments for approximately one month. This proactive approach of making pre-reading materials and assignments available to participants ahead of the camp ensured that they arrived well-equipped and ready to make the most out of the learning experience.

SPEAKERS' LINE UP

Reshma Menon

Assistant Teaching Professor, University of California, MERCED

Reshma taught Conditional Probability, Bayes' Theorem, and Calculus. She made the class quite engaging by bringing examples from COVID-19 testing, mammogram testing for cancer, and the failure of the Challenger launch in 1986.

Shriprasad Tambe

Number Theorist and Faculty for Math Olympiad Training Programs.

Tambe discussed the basics of time estimates and various algorithms for determining the primality of a given number. He explained the AKS algorithm in detail, highlighting the relevance and importance of their paper. Additionally, he covered algebraic concepts such as Rings, Fields, Groups, and quotienting necessary for understanding that paper.

S. Muralidharan

Retd Computer Scientist from TCS

Muralidharan delved into the world of Geometric Transformations and introduced students to Projective Geometry.

Bhas Bhamre

Founder of Bhas Bhamre Academy in Nasik

Bhas conducted sessions on deriving famous functions in Number Theory through explorative and inquiry-based methods. Additionally, he covered trigonometric ratios for plane angles and introduced students to Spherical Geometry and Trigonometry in spherical triangles.

Aadityan Ganesh

A graduate from Chennai Mathematical Institute, PhD student at Princeton University, and an alumnus of RAM

Aadityan covered topics such as Prophet Inequalities, hiring secretaries, and exponential weights—focusing on making decisions with uncertainty over future rewards.

R. Hariharan

A co-founder of RAM Foundation and currently an Assistant Professor in Managerial Accounting at the Frankfurt School of Finance and Management

Hariharan taught Quadratic Indeterminate Equations (Pell's Equation). He also covered the Theory of Machine Learning and Causal Inference, discussing Research Design, how to identify Causal Inference, and the difference between Correlation and Causation.

Vinay Nair

Co-Founder of Raising A Mathematician Foundation

Vinay continued to inspire students with his teachings on proof techniques such as Contrapositive, Contradiction, Mathematical Induction, and an Introduction to Graph Theory.

Partha Mukhopadhyay

Professor at Chennai Mathematical Institute

Partha took students through bivariate identities to identities with more variables. He discussed how to if an expression can form an identity via some stories and examples. He took the students to the deepest questions in Mathematics.

Sharuk A S

An alumnus of RAM TP and currently pursuing an undergraduate degree with a major in Statistics

Sharuk conducted a session on the Introduction to Sampling and the criteria for a good sample design in socio-economic surveys.

Prajakta Nimbhorkar

Associate Prof. at Chennai Mathematical Institute

Prajakta Introduced students to proofs in Graph Theory.

Matt Weinberg

Associate professor at Princeton University and an Associate Director at Princeton DeCenter

Matt gave a lecture on the role of understanding economic incentives in blockchains via the famous selfish mining attack on consensus protocols like Bitcoin that rely on longest chain consensus.

Clayton Thomas

Postdoctoral Researcher in the EconCS group at Microsoft Research, New England.

Clay introduced stable matchings to the students and covered the Gale-Shapley algorithm.

Swami Anukoolnanda

Resident Director of Chinmaya International Residential School, Coimbatore

Swami Ji started the day with insightful self-enquiry sessions, followed by an engaging and interactive post-dinner discussion with the students.

Chinthu Param

Music Educator from Sunaad, Bengaluru

Chinthu led the self-enquiry sessions grounded in shlokas from the Upanishads, blended music, storytelling, and interactive Q&A. Students found them beneficial for gaining focus and preparing for the more intense activities ahead.

CONCLUSION

RAM TP 2024 was the 11th edition of the flagship program of RAM Foundation. It was conducted at the foothills of Western Ghats. The serene and tranquil atmosphere was the perfect backdrop for the young minds to engage in some serious mathematics. They could be seen holding deep discussions everywhere - during the breaks, at the office hours, with the faculty in the corridors and even across the dinner table. The diverse topics, the stimulating peer group and the deeply passionate mentors was the perfect trifecta one could hope for in any engaging learning environment. It is not just the math, they now have a community to reach out to, connect with and be inspired by! The students of RAM TP 2024 would carry these seven days with them all their life.

SUPPORTERS

CHINMAYA INTERNATIONAL RESIDENTIAL SCHOOL (CIRS), COIMBATORE

This residential camp was held in the campus of CIRS, where they graciously sponsored the accommodation for students backed by the entire organizing team. Exceptional logistical support provided by CIRS ensured an efficient and enjoyable experience for campers. The lush green campus amidst the nature and frequently visited by peocock created an ideal environment for a fulfilling and pleasant experience for all participants.

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