# Cheenta
# Math Olympiad Program

Level 2

**cheenta.com**

since 2010

**Passion for Mathematics**

This program is useful for Math Kangaroo, Australian Math Competition, MOEMS

# Success Stories since 2010

## Aryan Kalia

Top 1% globally in American Math Competition,

Attended Math Olympiad Program and School Research Program at cheenta

Attended Student internship program at cheenta

**Going to Harvard University in 2022**

## Sambuddha Majumdar

Scotland Math Olympiad Awardee

Attended Math Olympiad Program at cheenta

Attended Student internship program at cheenta

**University of Edinburgh**

## Anushka Aggarwal

Youngest Indian National Math Olympiad awardee, Europian Girls Math Olympiad awardee

Attended Math Olympiad Program at cheenta

Attended Student internship program at cheenta

**Going to MIT (Massachusetts Institute of Technology) in 2022**

## Akshaj Kadaveru

American Math Competition, AIME and USAJMO awardee

Attended Math Olympiad Program at cheenta

**MIT (Massachusetts Institute of Technology)**

# Curriculum
# driven by problem solving

## 48 weeks program, 7 modules

### Spatial Patterns II-θ
7 weeks

- Paper folding, Net of a Cube, implementation in GeoGebra, Paper Model of a cube
- Making a cube in GeoGebra, drawing points, line segments and polygons
- Paper folding, Net of a Tetrahedron, implementation in GeoGebra, Paper Model of a Tetrahedron
- Making a Tetrahedron in GeoGebra, drawing points, line segments and polygons
- Coloring paper cubes and tetrahedron, counting edges, vertices and faces
- Drawing cube and tetrahedron on paper, marking midpoints of faces, making and recognizing dual polyhedra
- Review and Evaluation

### Spatial Patterns II-δ
7 weeks

- What is rotation, illustration in GeoGebra, rotating a pattern to find resulting figure
- Implement rotation in GeoGebra, use the rotation command to move polygons
- Missing shapes in a pattern list
- What is reflection, illustration in GeoGebra, rotating a pattern to find resulting figure
- Implement reflection in GeoGebra, use the reflect command to move polygons
- Building shapes using blocks, Quadrilaterals, Triangles etc on Pegboards
- Review and Evaluation

# Curriculum **continues**

## Numerical Pattern II - θ

7 weeks

- Number sequences, guessing the next number
- Number of Triangles formed by joining midpoints of sides, dot triangle computation
- Missing numbers in magic squares, making magic squares
- Tower of Hanoi - gamified as a math circle
- Unitary reasoning with applications in time and distance I
- Unitary reasoning with applications in time and distance II
- Review and Evaluation

## Numerical Pattern II -$\delta$

7 weeks

- Fold papers to mark 1/2, marking fractions in Geogebra
- Addition and multiplication principle of counting I
- Addition and multiplication principle of counting II
- Number of ways of choosing 1, 2, 3 objects from 3 distinct objects. Tree Diagrams
- Number of paths on a grid
- Seeds of bijection principle, tickets in cinema hall, paths on a grid problem
- Review and Evaluation

## Mathematical Imagination II

6 weeks

- Projection diagrams I
- Projection diagrams II
- Shortest paths on platonic solids - cubes, tetrahedron
- Locus of a moving point, string and pencil construction of circle
- Locus of a circle implementation in GeoGebra, concept of rotation
- Review and Evaluation

# Curriculum **continues**

## Arithmetry II - θ

7 weeks

- Cryptarithmetic, making of secret codes using letters and numbers, Caesar Cipher
- Addition and Subtraction using geometry
- Multiplication using tree diagram, Counting edges in a tree.
- Division in tree diagram, division as an inverse operation of multiplication
- Fractions as a part of whole, drawing and coloring 1/2, 1/3, 1/4, geometric adding of fractions
- Fractions as ratio of two parts, drawing and coloring 1/2, 1/3, 1/4, geometric adding of fractions
- Review and Evaluation

## Arithmetry II - $\delta$

7 weeks

- Cryptarithmetic; Polybius square
- Relation between fraction and ratio
- Two ways of understanding fractions: division and comparison
- Fractions as a part of whole, drawing and coloring 2/3, 2/4, 3/4, geometric adding of fractions
- Concept of odd, even numbers
- Problems on parity
- Review and Evaluation

# Taught by Olympians **and Researchers from leading universities**

Since 2010 Cheenta has evolved into a Gurukul. Our students have attended leading universities in India such as Indian Statistical Institute, Chennai Mathematical Institute, TIFR, IITs and universities abroad such as Harvard, MIT, Oxford, Edinburgh to name a few. Some of them returned as teachers for the next generation of learners. And the pursuit of excellence continues.

## Cheenta Team has 40+ members. Here are some of the leaders.

**Srijit Mukherjee**
BStat and MStat from Indian Statistical Institute (India)
Director at Cheenta

**Dr. Ashani Dasgupta**
PhD from University of Wisconsin-Milwaukee (USA)
Founder - Director at Cheenta

**Dr. Sankhadip Chakraborty**
PhD from IMPA, BSc. Math from Chennai Mathematical Institute (India),
Director at Cheenta

**Dr. Anirban Majumdar**
PhD from ENS Paris-Saclay, France on Theoretical Computer Science, B.Sc.-M.Sc. from Chennai Mathematical Institute

**Swarnabja Bhowmick**
B.Tech from Calcutta University on Computer Science with multiple IEEE publications on Artificial Intelligence and Machine Learning

**Namrata Dutta**
BSc. in Physics and MSc in Electronics from University of Calcutta.

# Contest Calendar
# **for beautiful problem solving**

Cheenta students think of Math Olympiads as **milestones**. The end goal of the program is to fall in love with mathematics and develop great problem solving skills. Milestones help us to stay in track.

Not all math contests are equal. Here is a list of contests that are suitable and most effective at this level of learning.

Our success centre will keep you updated about registration deadlines of these contests and other opportunities

**Math Kangaroo**

**Australian Math Competition**

**MOEMS**

# Refund policy

## since trust is the cornerstoner of education

Within 1 week of admission, if you wish to withdraw from the course due to dissatisfaction with our offerings, we will start your **[full refund - service fee of ₹1000 (India) or US$20 (Rest of the World) - Transaction fee if any]** process provided **all four of these activities** are done on your part:

a. Attended live full length lecture session for full time (not video recording)
b. Attempted the assignments during that period
c. Attended at least one 1-on-1 session
d. Used the Cheenta Support forum for doubts
e. The Refund reason should be associated with the coursework, any personal reason won't be counted & hence the refund request will be nullified.

The refund process is usually completed within 8 weeks of the refund request. We will refund the [full refund - service fee of ₹1000 (India) or US$20 (Rest of the World) - Transaction fee if any], if you begin the refund process within 1 week (see the first point).

If a refund request is not placed within the first week, or if such a request is placed without completing steps a, b, c d, or e or if the refund request is made due to personal reasons, then we won't be able to process any refund.

# Thank You

**Passion for Mathematical Science**

Let us know if you need more information.


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