



## How the classes work

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Every week you should *attend*:

- 2 Lecture Sessions (90 minutes long; conducted online or offline depending on your subscription)
- 1 Problem Solving cum Doubt Clearing Session (120 minutes long)

Every month you should *do*

- Monthly problem list (these are your monthly assignments)
- Monthly Long Test
- Read the Monthly Evaluation Report

If you have *doubts and/or questions*, then you may

- Attend Bridge Sessions
- Attend Doubt Clearing Classes

**Cheenta Support:**

- Support e-mail: [helpdesk@cheenta.com](mailto:helpdesk@cheenta.com)
- Support phone: +91 79805 32630 (India); +1 414 204 5495 (Rest of the World)



# Curriculum

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## Number Theory I

This is the first course in elementary number theory:

- **NT.I.1** Primes, Divisibility
  - **NT.I.2** Arithmetic of Remainders
  - **NT.I.3** Bezout's Theorem and Euclidean Algorithm
  - **NT.I.4** Theory of congruence
  - **NT.I.5** Number Theoretic Functions
  - **NT.I.6** Theorems of Fermat, Euler, and Wilson
  - **NT.I.7** Pythagorean Triples
  - **NT.I.8** Chinese Remainder Theorem
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## Combinatorics I

This is the first course in combinatorics and elementary counting techniques:

- **Com.I.1** Multiplication and Addition rules
  - **Com.I.2** Bijection Principles
  - **Com.I.3** Combinatorial Coefficients
  - **Com.I.4** Inclusion and Exclusion Principles
  - **Com.I.5** Pigeon Hole Principle
  - **Com.I.6** Recursions
  - **Com.I.7** Shortest Route Problems
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## Algebra I

This is a first course in school algebra. (We assume that the student is familiar with algebraic expressions, and elementary algebraic identities)

- **Alg.I.1** Algebraic identities (Sophie Germain, Cube of three etc.)
  - **Alg.I.2** Mathematical Induction
  - **Alg.I.3** Binomial Theorem
  - **Alg.I.4** Linear Equations
  - **Alg.I.5** Quadratic Equation
  - **Alg.I.6** Remainder Theorem
  - **Alg.I.7** Theorems related to roots of an integer polynomial
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## Geometry I

- **Geo.I.1** Locus visualization
  - **Geo.I.2** Straight Lines
  - **Geo.I.3** Triangles
  - **Geo.I.4** Geometric Constructions
  - **Geo.I.5** Circles
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## Trigonometry I

- **Trig.I.1** Angle and rotation
- **Trig.I.2** Half arcs and Half chords - Genesis of trigonometric ratios
- **Trig.I.3** Elementary ratios and associated angles
- **Trig.I.4** Trigonometric identities
- **Trig.I.5** Geometry and trigonometry
- **Trig.I.6** Basic properties of Triangles



- **Trig.I.7** Compound Angles
  - **Trig.I.8** Multiple and Submultiple Angles
  - **Trig.I.9** Trigonometric Series
  - **Trig.I.10** Height and Distance
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## Inequality I

This first course in inequality must be preceded by a basic course in algebra.

- **Ineq.I.1** Geometric Inequalities
  - **Ineq.I.2** Arithmetic and Geometric Mean Inequality
  - **Ineq.I.3** Cauchy Schwarz Inequality
  - **Ineq.I.4** Titu's Lemma
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## Complex Number I

- **Complex.I.1** Geometry of Screw Similarity
  - **Complex.I.2** Field Properties of complex Number
  - **Complex.I.3** nth roots of unity and Primitive roots
  - **Complex.I.4** Basic applications to geometry
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## Calculus I

- **Calc.I.1** Sequences and Series
- **Calc.I.2** Limit
- **Calc.I.3** Functions
- **Calc.I.4** Continuity
- **Calc.I.5** Differential Calculus
- **Calc.I.6** Cauchy's Theorem and Mean value



- **Calc.I.7** Graphing Techniques
  - **Calc.I.8** Integral Calculus
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### Coordinate Geometry I

- **CG.I.1** Straight Lines
  - **CG.I.2** Circles
  - **CG.I.3** Parabola
  - **CG.I.4** Ellipse
  - **CG.I.5** Hyperbola
  - **CG.I.6** Polar loci
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