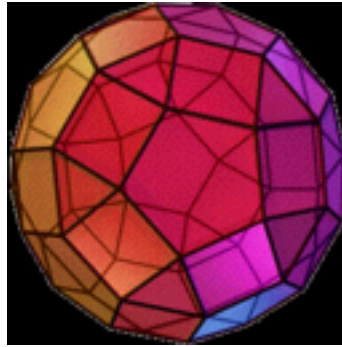


Cheenta Math Olympiad Course Description



NUMBER THEORY

Hours

Levels

40

Number Theory 6

- Problems from International Math Olympiad

30

Number Theory 5

- Diophantine Equation
- Pythagorean triplet
- Lifting the exponent
- Mobius Inversion

20

Number Theory 4

- Residue Classes
- Euler's Theorem
- Equivalence Classes
- Number Theoretic Functions
- Chinese Remainder Theorem

20

Number Theory 3

- Fermat's Little Theorem
- Mathematical Induction
- Binomial Theorem
- Bezoat's Theorem
- Wilson's Theorem

20

Number Theory 2

- Modular Arithmetic
- Divisibility Rules
- Power of a prime in a factorial
- Cyclicity of Last Digit

30

Number Theory 1

- Prime Numbers and factorisation
- Coprimes, GCD, LCM
- Factorial Notation
- Arithmetic of Remainder

160

GEOMETRY

40

Geometry 8

- Problems from International Math Olympiad
- Projective Geometry

40

Geometry 7

- Application of complex numbers
- Barycentric coordinates
- Vectors

30

Geometry 6

- Isometry
- Spiral Similarity
- Inversion

30

Geometry 5

- Construction Problems
- Geometric Transformation
- Translation
- Rotation

30

Geometry 4

- Geometry of circle
- Cyclic Quadrilaterals
- Ptolemy's Theorem

40

Geometry 3

- Trigonometry
- Area related problems
- Pythagoras Theorem

30

Geometry 2

- Properties of parallel lines
- Thales theorem
- Properties of triangles

30

Geometry 1

- Problems on angles
- Adjacency and locus problems
- Basic geometric figures

270

COMBINATORICS

40

Combinatorics 5

- Problems from International Math Olympiad
- Mathematical Games

40

Combinatorics 4

- Geometric Combinatorics
- Invariance Principle
- Graph Theory Advanced
- Extremal Principle

40

Combinatorics 3

- Combinatorial Identities
- Recurrence Relations
- Generating Function
- Partition Problems

30

Combinatorics 2

- Elementary Graph Theory
- Binomial Theorem and Multinomial Theorem
- Bijection Principle
- Inclusion Exclusion Principle

40

Combinatorics 1

- Basic counting principle
- Pigeon Hole Principle
- Permutation and Combination
- Binomial Coefficients
- Pascal's Triangle

230

ALGEBRA

40

Functional Equation

- Regular problems and techniques
- Cauchy's Functional Equation
- Usage of limit and continuity properties

40

Inequality 3

- Normalisation
- Homogenisation
- Schur Convexity

40

Inequality 2

- Power Mean Inequality
- Tchebycheff
- Bernoulli
- Jensen's Inequality
- Moorihead and other standard inequalities

30

Inequality 1

- Basic inequality rules
- A.M.-G.M. Inequality
- Cauchy Schwarz

40

Theory of Equation 3

- Advanced Problems from International Math Olympiad

30

Theory of Equation 2

- Root Investigation
- Integer Polynomial
- Rational Root Theorem

30

Theory of Equation 1

- Quadratic Equation
- Vieta's Theorem
- De Carte's Rule

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