

Hong Kong International Mathematical Olympiad Syllabus

Kindergarten Group

Topics	Kindergarten Group
Logical Thinking	➤ Balance Problem ➤ Basic Number Pattern ➤ Basic Number Sequence ➤ Basic Figure Pattern ➤ IQ Age Problem ➤ IQ Date Problem
Arithmetic	➤ Smart Addition on 1-digit numbers ➤ Addition on 1-digit numbers with carrying ➤ Addition on 2-digit numbers without carrying ➤ Smart Subtraction on 1-digit numbers ➤ Subtraction on 1-digit numbers with carrying ➤ Subtraction on 2-digit numbers without carrying ➤ Balance on an equation
Number Theory	➤ Introduction on Odd & Even numbers ➤ Mathematical Leveling ➤ Basic Fibonacci Series ➤ Match Equation ➤ Basic Number Pattern ➤ Simple Number Distribution
Geometry	➤ Counting on 2-D Figures & 3-D Figures ➤ Counting on number of sides & interior angles ➤ Distinction on 2-D Figures ➤ Basic Figure Pattern
Combinatorics	➤ Arranging the numbers in orders ➤ Simple Distribution ➤ Counting on specific numbers ➤ Formation of a 3-digit number ➤ Comparison on magnitude of 2-digit numbers

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Primary Group

Topics	Primary 1	Primary 2	Primary 3
Logical Thinking	➤ Balance Problem ➤ Basic Number Pattern & Sequence ➤ Basic Figure Pattern ➤ IQ Age Problem & Date Problem ➤ Guess on 2-digit numbers	➤ Balance Problem ➤ Basic Number Pattern & Sequence ➤ Basic Figure Pattern ➤ IQ Age Problem & Date Problem ➤ Guess on 2-digit numbers	➤ Periodic Problem ➤ Advanced Figure Pattern ➤ IQ Age Problem & Date Problem ➤ Guess on 3-digit numbers ➤ Basic Pigeonhole Principle
Arithmetic	➤ Smart Addition on 1-digit numbers with carrying ➤ Smart Subtraction on 1 to 2-digit numbers with carrying ➤ Multiplication on 1 to 2-digit numbers without carrying ➤ Balance on an equation	➤ Smart Addition on 2-digit numbers with carrying ➤ Smart Subtraction on 1 to 2-digit numbers with carrying ➤ Multiplication on 2-digit numbers with carrying ➤ Balance on an equation	➤ Gaussian Addition ➤ Smart Addition on 3-digit numbers with carrying ➤ Smart Subtraction on 3-digit numbers with carrying ➤ Multiplication on 3-digit numbers
Number Theory	➤ Introduction on Odd & Even ➤ Mathematical Leveling ➤ Advanced Fibonacci Series ➤ Match Equation ➤ Basic Arithmetic Pattern	➤ Introduction on Odd & Even ➤ Mathematical Leveling ➤ Advanced Fibonacci Series ➤ Match Equation ➤ Basic Arithmetic Pattern	➤ Introduction on prime numbers ➤ Sum, Difference & Multiples ➤ Arithmetic Operation ➤ Basic Arithmetic Pattern ➤ Simple Divisibility
Geometry	➤ Counting on number of 2-D & 3-D Figures ➤ Counting on number of sides & interior angles ➤ Distinction on 2-D Figures ➤ Basic Figure Pattern	➤ Counting on number of 2-D & 3-D Figures ➤ Counting on number of sides & interior angles ➤ Distinction on 2-D Figures ➤ Basic Figure Pattern	➤ Counting on number of 2-D Figures ➤ Counting on Vertices, Faces & Edges of 3-D Figures ➤ Observations about 3-D Figures ➤ Basic Concept about Area & Perimeter ➤ Relationship between Line Segments, Angles & Figures
Combinatorics	➤ Seven Bridges of Königsberg ➤ Arranging numbers in orders ➤ Simple Distribution ➤ Counting on specific numbers ➤ Formation of a 3-digit number	➤ Arranging numbers in orders ➤ Simple Distribution ➤ Counting on specific numbers ➤ Formation of a 3-digit number ➤ Simple Combination	➤ Basic Routing Problem ➤ Advanced Distribution ➤ Counting on specific numbers ➤ Formation of a 3-digit number ➤ Excess and Deficiency

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Primary Group

Topics	Primary 4	Primary 5	Primary 6
Logical Thinking	➤ Periodic Problem ➤ Advanced Figure Pattern ➤ Chicken Rabbit Theorem ➤ Guess on 3-digit numbers ➤ Basic Pigeonhole Principle	➤ Chicken Rabbit Theorem ➤ Speed, Distance & Time Problem ➤ Guess on 4-digit numbers by given number properties ➤ Advanced Pigeonhole Principle	➤ Construction Problem ➤ Speed, Distance & Time Problem ➤ Guess on 4-digit numbers by given number properties ➤ Advanced Pigeonhole Principle
Arithmetic	➤ Gaussian Addition ➤ Smart Addition on 4-digit numbers with carrying ➤ Smart Subtraction on 4-digit numbers with carrying ➤ Multiplication on 3-digit numbers	➤ Advanced Gaussian Addition ➤ Smart Calculation on Decimals & Fractions ➤ Sum of a series of square numbers ➤ Method of Difference equations ➤ Smart Addition on 5-digit numbers with carrying	➤ Advanced Gaussian Addition ➤ Smart Calculation on Fractions ➤ Sum of a series of square numbers ➤ Sum of a series of cubic numbers ➤ Method of Difference equations ➤ Sum of Geometric Sequence
Number Theory	➤ Introduction on prime numbers ➤ Sum, Difference & Multiples ➤ Arithmetic Operation ➤ Relationship between L.C.M & H.C.F ➤ Simple Divisibility	➤ Advanced Divisibility ➤ Number of positive factors ➤ Sum of all positive factors ➤ Unit digit of a series of n-digit numbers	➤ Advanced Divisibility ➤ Number of positive factors ➤ Sum of all positive factors ➤ Unit digit of a series of n-digit numbers
Geometry	➤ Counting on number of 2-D Figures ➤ Counting on Vertices, Faces & Edges of 3-D Figures ➤ Observations about 3-D Figures ➤ Basic Concept about Area & Perimeter ➤ Relationship between Line Segments, Angles & Figures	➤ Area & Perimeter of 2-D Figures ➤ Ratio of Area of 2-D Figures ➤ Volume & Surface Area of 3-D Figures ➤ Counting on number of 2-D Figures ➤ Relationship between Line Segments, Angles & Figures	➤ Area & Perimeter of 2-D Figures ➤ Ratio of Area of 2-D Figures ➤ Volume & Surface Area of 3-D Figures ➤ Area of circle & Circumstance ➤ Relationship between Line Segments, Angles & Figures
Combinatorics	➤ Basic Routing Problem ➤ Advanced Distribution ➤ Counting on specific numbers ➤ Formation of a 3-digit number ➤ Excess and Deficiency	➤ Advanced Pigeonhole Principle ➤ Advanced Routing Problem ➤ Combinations & Permutations ➤ Principle of Inclusion and Exclusion ➤ Excess and Deficiency	➤ Advanced Pigeonhole Principle ➤ Advanced Routing Problem ➤ Combinations & Permutations ➤ Principle of Inclusion and Exclusion ➤ Simple Probability

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Secondary Group

Topics	Secondary 1	Secondary 2
Logical Thinking	➤ Advanced Periodic Problems ➤ Speed, Distance & Time Problem ➤ Advanced Pigeonhole Principle ➤ Guess on 4-digit numbers ➤ Relationship between mean, median & sum	➤ Advanced Pigeonhole Principle ➤ Guess on 4-digit numbers ➤ Relationship between mean, median & sum ➤ Advanced Distributions ➤ Advanced Periodic Problems
Algebra	➤ Operation on directed numbers ➤ Algebraic expression ➤ Linear Equations ➤ Introduction on Absolute Value ➤ Simplification on surd form ➤ Euclidean Algorithm	➤ Algebraic expression ➤ Factorization ➤ Introduction on Absolute Value ➤ Simplification on surd form ➤ Euclidean Algorithm ➤ Introduction on Inequalities
Number Theory	➤ Advanced problems on Prime Numbers ➤ Counting on possible solution(s) on Indefinite equations ➤ Introduction on repeating surd forms ➤ Sum of all Digits ➤ Relationship between L.C.M & H.C.F	➤ Periodic remainder problems ➤ Counting on possible solution(s) on Indefinite equations ➤ Introduction on repeating surd forms ➤ Extreme values of a polynomial ➤ Factor Theorem
Geometry	➤ Usage of Pythagorean theorem ➤ Characteristics of Congruent Triangles & Similar Triangles ➤ Area of circle & Circumstance ➤ Relationship between Line Segments, Angles & Figures ➤ Knowledge on Rectangular Coordinate System ➤ Volume & Surface Area of 3-D Figures	➤ Advanced usage of Pythagorean theorem ➤ Characteristics of Congruent Triangles & Similar Triangles ➤ Triangle Inequality ➤ Relationship between Line Segments, Angles & Figures ➤ Knowledge on Rectangular Coordinate System ➤ Concepts about angle bisectors
Combinatorics	➤ Advanced Pigeonhole Principle ➤ Advanced Routing Problem ➤ Combinations & Permutations ➤ Principle of Inclusion and Exclusion ➤ Simple Probability ➤ Triangle Inequality	➤ Advanced Pigeonhole Principle ➤ Advanced Routing Problem ➤ Combinations & Permutations ➤ Principle of Inclusion and Exclusion ➤ Simple Probability ➤ Counting on Like & Unlike Terms of a polynomial

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Secondary Group

Topics	Secondary 3	Senior Secondary Group (S4 – S6 in ONE group)
Logical Thinking	➤ Advanced Pigeonhole Principle ➤ Guess on 4-digit numbers ➤ Relationship between mean, median & sum ➤ Advanced Distributions ➤ Advanced Periodic Problems	➤ Advanced Pigeonhole Principle ➤ Guess on 5-digit numbers ➤ Relationship between mean, median & sum ➤ Advanced Distributions ➤ Advanced Periodic Problems
Algebra	➤ Sum & Product of roots of a quadratic equation ➤ Algebraic expression ➤ Introduction on Absolute Value ➤ Simplification on surd form ➤ Euclidean Algorithm ➤ Introduction on Inequalities	➤ Sum & Product of roots of a quadratic equation ➤ Algebraic expression ➤ Introduction on Absolute Value ➤ Simplification on surd form ➤ Euclidean Algorithm ➤ Introduction on Inequalities
Number Theory	➤ Periodic remainder problems ➤ Counting on possible solution(s) on Indefinite equations ➤ Introduction on repeating surd forms ➤ Extreme values of a polynomial ➤ Modular Arithmetic	➤ Periodic remainder problems ➤ Counting on possible solution(s) on Indefinite equations ➤ Introduction on repeating surd forms ➤ Extreme values of a polynomial ➤ Modular Arithmetic ➤ Introduction on complex numbers
Geometry	➤ Advanced usage of Pythagorean theorem ➤ Menelaus' Theorem ➤ Relationship between Line Segments, Angles & Figures ➤ Advanced knowledge on Rectangular Coordinate System ➤ Trigonometry	➤ Advanced knowledge on Rectangular Coordinate System ➤ Menelaus' Theorem ➤ Relationship between Line Segments, Angles & Figures ➤ Circumcentre, Incentre, Centroid & Orthocentre ➤ Trigonometry
Combinatorics	➤ Advanced Pigeonhole Principle ➤ Combinations & Permutations ➤ Principle of Inclusion and Exclusion ➤ Advanced Probability ➤ Counting on Like & Unlike Terms of a polynomial	➤ Advanced Pigeonhole Principle ➤ Combinations & Permutations ➤ Principle of Inclusion and Exclusion ➤ Advanced Probability ➤ Counting on Like & Unlike Terms of a polynomial