



EXCEL
INTERNATIONAL

Course Name: Logical Thinking in Mathematics

1. Course Module Structure

This course is divided into 10 structured modules designed to develop logical reasoning, analytical thinking, and problem-solving skills in mathematics. Each module focuses on strengthening conceptual clarity through step-by-step reasoning, practical exercises, puzzles, and real-life applications. The course emphasizes understanding the “why” behind mathematical concepts and building a strong logical foundation.

2. Module, 3. Topic & 4. Module for 10

Module 1: Introduction to Logical Thinking

Topics:

- Understanding logic and reasoning
 - Statements and propositions
 - Truth values (true/false)
 - Real-life examples of logical thinking
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Module 2: Mathematical Statements & Operations

Topics:

- Simple and compound statements
 - Logical operations (AND, OR, NOT)
 - Truth tables
 - Forming logical expressions
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Module 3: Patterns and Sequences

Topics:

- Number patterns
- Visual patterns

- Arithmetic and geometric sequences
 - Predicting patterns logically
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Module 4: Deductive & Inductive Reasoning

Topics:

- Deductive reasoning concepts
 - Inductive reasoning techniques
 - Identifying patterns and rules
 - Real-life reasoning applications
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Module 5: Problem-Solving Strategies

Topics:

- Breaking down complex problems
 - Working backwards
 - Trial and error method
 - Logical step-by-step solutions
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Module 6: Set Theory Basics

Topics:

- Introduction to sets
 - Types of sets
 - Union, intersection, complement
 - Venn diagrams
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Module 7: Mathematical Reasoning & Proofs

Topics:

- Introduction to proofs
 - Direct proof method
 - Proof by contradiction
 - Logical justification of answers
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Module 8: Analytical Thinking & Puzzles

Topics:

- Logical puzzles
- Brain teasers

- Coding-decoding basics
 - Sequence-based reasoning
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Module 9: Real-Life Applications of Logic

Topics:

- Decision-making using logic
 - Data interpretation
 - Problem-solving in daily life
 - Critical thinking exercises
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Module 10: Practice & Final Assessment

Topics:

- Mixed logical problems
- Practice tests
- Time management techniques
- Final evaluation and analysis