

MC15F-1

Introduction to Elementary School Math Competitions Part 1

Session 1 : Integers & Arithmetic

- Order of Operations with Integers and four basic operations
- Word problems only using arithmetic with integers without the need of unknowns

Session 2 : Rate and Proportion

- Definition of ratio, rate and proportion
- Given the ratio of two numbers and one of the numbers, finding the other one
- Given the ratio of two numbers and their sum (or difference), finding the numbers

Session 3 : Fractions

- Different types of fractions (proper, improper, mixed, common)
- Basic arithmetic with fractions and related word problems

Session 4 : Decimals

- Arithmetic and applications of decimals and related word problems
- Conversions between fractions and decimals

Session 5 : Percents

- Conversions between percent and fractions/decimals
- Word problems involving percent (tax, tip, interest, etc.)

Session 6 : Exponents

- Basic properties of exponents (multiplying, dividing, raising an exponent to another exponent)
- Perfect powers (squares and cubes) and square roots (of perfect squares)

Session 7 : Problem Solving Techniques

- Solving word problems using the backward problem-solving technique
- Solving word problems using the bar model (or bar diagram) technique

Session 8 : Math League Exam Review

- Mock exam for The Math League Contest
- Reviewing the test/exam

Session 9 : Addition and Multiplication Principles

- Using addition to count the number of ways to accomplish a task
- Using multiplication to count the number of ways to accomplish a task

Session 10 : Permutations

- Definition of the factorial ($n!$)
- Permutations - Finding the number of ways to choose k items from a set of n items where the ordering of items is important

Session 11 : Combinations

- How to compute n choose k
- Difference between combinations and permutations taken k at a time
- Number of ways to form a committee using combinations

Session 12 : Noetic Exam Review

- Mock exam for Noetic Learning Mathematics Contest
- Reviewing the test/exam

Session 13 : Counting Sets

- Simple definition of a set in mathematics (finite sets, including the empty set)
- Solving word problems using Venn diagrams, and Principle of Inclusion-Exclusion

Session 14 : Counting Shapes & Paths

- Counting the number of shapes or paths systematically (e.g. using combinations)

Session 15 : Probability-1

- Definition of probability (number of desired outcomes divided by the total number of outcomes)
- Calculating probability of independent events

Session 16 : PIMC Exam Review

- Mock exam for PI Math Contest
- Reviewing the test/exam