

International Math Olympiad Handbook

– Grade 10

This handbook covers topics for Grade 10 students (Age 15–16).

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Introduction

Grade 10 students focus on algebra, functions, quadratic & linear equations, probability, trigonometry, coordinate geometry, geometry, and problem-solving for Olympiads.

Curriculum Topics

- Algebra: polynomials, quadratic equations, factorization
- Functions: linear, quadratic, inverse
- Trigonometry: sine, cosine, tangent, Pythagoras
- Geometry: circles, triangles, quadrilaterals, similarity, congruence
- Coordinate Geometry: distance, midpoint, slope, line equations
- Probability & Statistics
- Word Problems & Olympiad Challenges
- Logical Reasoning, Number Series, Puzzles

Examples & Explanations

- **Algebra:** Solve $x^2 - 5x + 6 = 0 \rightarrow x=2,3$
- **Trigonometry:** $\cos 60^\circ = 1/2$

- **Geometry:** Area, perimeter, circles
- **Coordinate Geometry:** Line through points (1,2),(3,4) \rightarrow equation $y = x+1$
- **Probability:** Multiple events
- **Word Problems:** Multi-step reasoning

Practice Problems

1. Solve: $x^2 - 7x + 12 = 0$
2. $f(x) = 2x^2 + 3x$, $f(2) = ?$
3. $\sin 30^\circ = ?$
4. Distance between (2,3) & (5,7)
5. Probability: draw heart = ?
6. Word problem: $200 \div 4 + 15 = ?$