

Introduction to Olympiad Junior Video Series

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Each section corresponds to a video

1 Welcome to the Series

Welcome students to the series and introduce the instructors:

1. Okezie Chiedozie
2. Oluwasanya Awe

This series is targeted to students who are new to Olympiads and will provide the foundation for advanced topics.

Go over the topics that will be reviewed during this series:

1. Algebra: study of mathematical structures and their properties, including equations, polynomials, and functions
 - (a) Exponents and Logarithms
 - (b) Complex Numbers
 - (c) Linear Equations
 - (d) Proportions
 - (e) Quadratic Equations
 - (f) Special Factorizations and Clever Manipulations
 - (g) Functions
 - (h) Inequalities
 - (i) Operations and Relations
 - (j) Sequences and Series
2. Geometry: study of shapes, sizes, positions, and properties of points, lines, angles, and planes
 - (a) An Introduction to Circles
 - (b) Triangles
 - (c) Quadrilaterals

- (d) Polygons
 - (e) Angle Chasing
 - (f) Areas
 - (g) The Power of Coordinates
 - (h) Power of a Point
 - (i) Three Dimensional Geometry
 - (j) Shifts, Turns, Flips, Stretches, and Squeezes
3. Number Theory: study of properties of numbers including primes, divisibility, and modular arithmetic
 - (a) Using the Integers
 4. Combinatorics: study of counting and arranging objects, including permutations, combinations, and graphs
 - (a) Learning to Count
 - (b) Sets
 5. Probability and Statistics: study of random events and their properties.

We will wrap up the series by learning how to write mathematical proofs.

2 Course Guidance

Provide some advice on making the most of the series:

1. Actively engage with the content
2. Don't memorize; understand the key ideas and reconstruct them
3. Attempt the exercises/problems before viewing the solution
4. Be patient; work at your own pace
5. Seek help after spending sufficient time on the problems
6. Journal; reflect on interesting problems and ideas you experience