

Theoretical Developments in Pure Mathematics

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Editorial

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INTRODUCTION

Pure mathematics explores abstract structures and logical foundations, often laying groundwork for future applied innovations. Its domains include algebra, topology, geometry, number theory, and logic.

Core Areas of Pure Mathematics

Algebra: Modern algebra studies structures like groups, rings, and fields. Current research examines representation theory and its applications to physics [1].

Topology: Topology investigates properties preserved under deformation. Knot theory and algebraic topology find applications in DNA modeling and quantum theory [2].

Geometry: Geometry has evolved from Euclidean frameworks to modern differential and algebraic geometry, with implications in relativity and string theory [3].

Number Theory: Number theory continues to influence cryptography, modular forms, and Diophantine equations. Prime distribution remains an active research focus [4].

Mathematical Logic: Logic underpins proof theory, model theory, and computability. It ensures mathematical consistency and influences theoretical computer science [5].

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