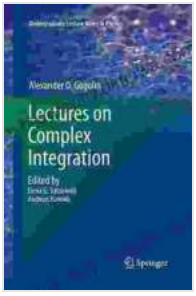
Lectures On Complex Integration: Unveiling the Secrets of Analytic Functions and Residues

Complex integration is a fundamental branch of mathematical analysis that deals with the integration of complex-valued functions. It finds numerous applications in various fields of science and engineering, including physics, fluid mechanics, and electrical engineering. This comprehensive e-book, "Lectures On Complex Integration: Undergraduate Lecture Notes In Physics," provides an in-depth exploration of this captivating subject.



Lectures on Complex Integration (Undergraduate Lecture Notes in Physics) by Elena G. Tsitsishvili

★★★★★ 5 out of 5

Language	: English
File size	: 18437 KB
Text-to-Speech	: Enabled
Enhanced typesetting	: Enabled
X-Ray for textbooks	: Enabled
Word Wise	: Enabled
Print length	: 494 pages
Screen Reader	: Supported
Hardcover	: 337 pages
Item Weight	: 15.31 pounds
Dimensions	: 6.14 x 1.06 x 9.21 inches

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Delving into Complex Analysis

The e-book begins by introducing the basic concepts of complex analysis, including complex numbers, complex functions, and the complex plane.

The Cauchy-Riemann equations, which describe the necessary and sufficient conditions for a complex function to be differentiable, are thoroughly presented.

Exploring Analytic Functions

The concept of analytic functions takes center stage in the subsequent chapters. The e-book meticulously explains the properties and characteristics of analytic functions, demonstrating their importance in complex integration. The Cauchy integral formula, a cornerstone of complex analysis, is derived and its applications are extensively discussed.

Mastering Residues

Residues play a crucial role in complex integration. The e-book delves into the concept of residues and their calculation. The residue theorem, a powerful tool for evaluating integrals of complex functions, is carefully presented and its implications are explored.

Contour Integrals: A Geometric Approach

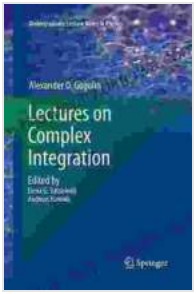
Contour integrals, line integrals taken along curves in the complex plane, are a central topic in complex integration. The e-book provides a geometric interpretation of contour integrals, enabling readers to visualize and understand the concept. The evaluation of contour integrals using residues is thoroughly explained.

Applications in Physics

The final chapter of the e-book showcases the practical applications of complex integration in physics. The e-book explores the use of complex integration in electromagnetism, fluid dynamics, and quantum mechanics.

Real-world examples illustrate the significance of complex integration in solving complex physics problems.

"Lectures On Complex Integration: Undergraduate Lecture Notes In Physics" is an invaluable resource for undergraduate students of physics and mathematics seeking a comprehensive understanding of complex integration. Through in-depth explanations, illustrative examples, and practical applications, the e-book empowers readers to navigate the intricacies of this fascinating subject.



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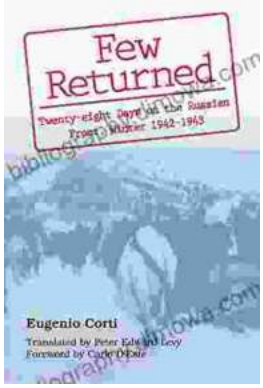

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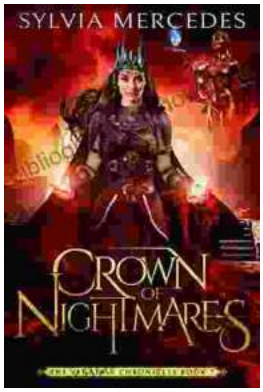

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