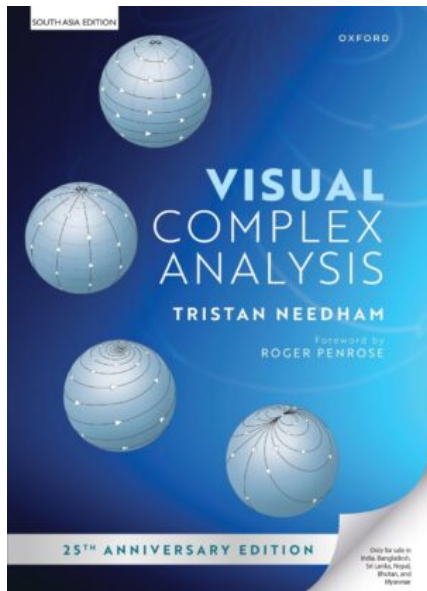


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Visual Complex Analysis, 25th Anniversary Edition



Author: Tristan Needham
with a new Foreword by
Roger Penrose

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About the Book

- Provides new, intuitive, geometrical explanations of all the fundamental results
- Includes the most complete and most geometrical treatments of Möbius Transformations and Hyperbolic Geometry available in any introduction to Complex Analysis
- Covers the topology and geometry of the vector-field interpretation of complex functions, including the Poincaré—Hopf Theorem, and the Pólya Vector Field interpretation of complex integration

New to this Edition:

- Each of the 503 figures now includes a brand-new caption that fully explains its mathematical content
- Includes a new Preface, and a new Foreword by Sir Roger Penrose

Complex Analysis is the powerful fusion of the complex numbers (involving the ‘imaginary’ square root of -1) with ordinary calculus, resulting in a tool that has been of central importance to science for more than 200 years.

This book brings this majestic and powerful subject to life by consistently using *geometry* (not calculation) as the means of explanation. The 501 diagrams of the original edition embodied geometrical arguments that (for the first time) replaced the long and often opaque computations of the standard approach, in force for the previous 200 years, providing direct, intuitive, *visual* access to the underlying mathematical reality.

This new *25th Anniversary Edition* introduces brand-new captions that fully explain the geometrical reasoning, making it possible to read the work in an entirely new way—as a highbrow comic book!

About the Author

Tristan Needham, Professor of Mathematics, University of San Francisco. Tristan Needham (son of the distinguished social anthropologist Rodney Needham) grew up in Oxford, England. He studied physics at Merton College, Oxford, before moving to the Mathematical Institute, where he enjoyed the great privilege of studying black holes under the supervision of Sir Roger Penrose. Tristan received his DPhil in 1987 and joined the faculty of the University of San Francisco in 1989. His continuing mission is to seek out new intuitive forms of understanding, and new visualizations.

Review

“*Visual Complex Analysis* is a delight, and a book after my own heart. By his innovative and exclusive use of the geometrical perspective, Tristan Needham uncovers many surprising and largely unappreciated aspects of the beauty of complex analysis.” – **Sir Roger Penrose**

“...it is comparable with Feynman’s *Lectures on Physics*. At every point it asks “why” and finds a beautiful visual answer.” – **Newsletter of the European Mathematical Society**

“Newton would have approved... a fascinating and refreshing look at a familiar subject... essential reading for anybody with any interest at all in this absorbing area of mathematics.” – **Times Higher Education Supplement**

“One of the saddest developments in school mathematics has been the downgrading of the visual for the formal. I’m not lamenting the loss of traditional Euclidean geometry, despite its virtues, because it too emphasised stilted formalities. But to replace our rich visual tradition by silly games with 2×2 matrices has always seemed to me to be the height of folly. It is therefore a special pleasure to see Tristan Needham’s *Visual Complex Analysis* with its elegantly illustrated visual approach. Yes, he has 2×2 matrices—but his are interesting.” – **Ian Stewart, New Scientist**

“an engaging, broad, thorough, and often deep, development of undergraduate complex analysis and related areas from a geometric point of view. The style is lucid, informal, reader-friendly, and rich with helpful images (e.g. the complex derivative as an “amplitwist”). A truly unusual and notably creative look at a classical subject.” – **Paul Zorn, American Mathematical Monthly**

“If your budget limits you to only buying one mathematics book in a year then make sure that this is the one that you buy.” – **Mathematical Gazette**

“I was delighted when I came across *Visual Complex Analysis*. As soon as I thumbed through it, I realized that this was the book I was looking for ten years ago.” – **Ed Catmull, former president of Pixar and Disney Animation Studios**

“The new ideas and exercises bring together a body of information potentially invaluable to researchers in fields from topology to number theory... this is only the beginning of a long list of famous facts for which Needham offers attractive visual proofs: Cauchy’s theorem is a satisfying example: you can see the contribution to the integral from each infinitesimal square vanish before your eyes. ” – **Frank Farris, American Mathematical Monthly**

“This informal style is excellently judged and works extremely well. Many of the arguments presented will be new even to experts, and the book will be of great interest to professionals working in either complex analysis or in any field where complex analysis is used.” – **David**

Armitage, *Mathematical Reviews*

“The arguments constructed are highly innovative; even veterans of the field will find new ideas here. This is a special book. Tristan Needham has not only completely rethought a classical field of mathematics, but has presented it in a clear and compelling way. *Visual Complex Analysis* is worthy of the accolades it has received” – **MAA Reviews**

“This new edition of *Visual Complex Analysis* applies Newton’s geometrical methods from the Principia and his concept of ultimate equality to Complex Analysis.” – **MathSciNet**

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