An introduction to numerical methods and analysis / James F. Epperson

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Deskripsi Lengkap: https://lib.ui.ac.id/detail?id=20395047&lokasi=lokal

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Abstrak

"The objective of this book is for readers to learn where approximation methods come from, why they work, why they sometimes don?t work, and when to use which of the many techniques that are available, and to do all this in an environment that emphasizes readability and usefulness to the numerical methods novice. Each chapter and each section begins with the basic, elementary material and gradually builds up to more advanced topics. The text begins with a review of the important calculus results, and why and where these ideas play an important role throughout the book. Some of the concepts required for the study of computational mathematics are introduced, and simple approximations using Taylor?s Theorem are treated in some depth. The exposition is intended to be lively and "student friendly". Exercises run the gamut from simple hand computations that might be characterized are "starter exercises", to challenging derivations and minor proofs, to programming exercises. Eleven new exercises have been added throughout including: Basins of Attraction; Roots of Polynomials I; Radial Basis Function Interpolation; Tension Splines; An Introduction to Galerkin/Finite Element Ideas for BVPs; Broyden?s Method; Roots of Polynomials, II; Spectral/collocation methods for PDEs; Algebraic Multigrid Method; Trigonometric interpolation/Fourier analysis; and Monte Carlo methods. Various sections have been revised to reflect recent trends and updates in the field"-- Provided by publisher.