

Advanced Engineering Mathematics Wylie Barrett

Focusing on the application of mathematics to chemical engineering, *Applied Mathematical Methods for Chemical Engineers* addresses the setup and verification of mathematical models using experimental or other independently derived data. The book provides an introduction to differential equations common to chemical engineering, followed by examples of first-order and linear second-order ordinary differential equations. Later chapters examine Sturm–Liouville problems, Fourier series, integrals, linear partial differential equations, regular perturbation, combination of variables, and numerical methods emphasizing the method of lines with MATLAB® programming examples. Fully revised and updated, this Third Edition: Includes additional examples related to process control, Bessel Functions, and contemporary areas such as drug delivery Introduces examples of variable coefficient Sturm–Liouville problems both in the regular and singular types Demonstrates the use of Euler and modified Euler methods alongside the Runge–Kutta order-four method Inserts more depth on specific applications such as nonhomogeneous cases of separation of variables Adds a section on special types of matrices such as upper- and lower-triangular matrices Presents a justification for Fourier-

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Bessel series in preference to a complicated proof
Incorporates examples related to biomedical
engineering applications Illustrates the use of the
predictor-corrector method Expands the problem
sets of numerous chapters Applied Mathematical
Methods for Chemical Engineers, Third Edition uses
worked examples to expose several mathematical
methods that are essential to solving real-world
process engineering problems.

Advanced Engineering Mathematics, 10th Edition is
known for its comprehensive coverage, careful and
correct mathematics, outstanding exercises, and self-
contained subject matter parts for maximum
flexibility. The new edition continues with the
tradition of providing instructors and students with a
comprehensive and up-to-date resource for teaching
and learning engineering mathematics, that is,
applied mathematics for engineers and physicists,
mathematicians and computer scientists, as well as
members of other disciplines.

Pedagogical insights gained through 30 years of
teaching applied mathematics led the author to write
this set of student oriented books. Topics such as
complex analysis, matrix theory, vector and tensor
analysis, Fourier analysis, integral transforms,
ordinary and partial differential equations are
presented in a discursive style that is readable and
easy to follow. Numerous examples, completely
worked out, together with carefully selected problem

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sets with answers are used to enhance students' understanding and manipulative skill. The goal is to make students comfortable in using advanced mathematical tools in junior, senior, and beginning graduate courses.

Integrating Maple V animation software and traditional topics of partial differential equations, this text discusses first and second-order differential equations, Sturm-Liouville eigenvalue problems, generalized Fourier series, the diffusion or heat equation and the wave equation in one and two spatial dimensions, the Laplace equation in two spatial dimensions, nonhomogenous versions of the diffusion and wave equations, and Laplace transform methods of solution. Annotation copyrighted by Book News, Inc., Portland, OR.

Designed for engineering graduate students, this book connects basic mathematics to a variety of methods used in engineering problems.

Advanced Engineering Mathematics provides comprehensive and contemporary coverage of key mathematical ideas, techniques, and their widespread applications, for students majoring in engineering, computer science, mathematics and physics. Using a wide range of examples throughout the book, Jeffrey illustrates how to construct simple mathematical models, how to apply mathematical reasoning to select a particular solution from a range of possible alternatives, and how to determine which

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solution has physical significance. Jeffrey includes material that is not found in works of a similar nature, such as the use of the matrix exponential when solving systems of ordinary differential equations.

The text provides many detailed, worked examples following the introduction of each new idea, and large problem sets provide both routine practice, and, in many cases, greater challenge and insight for students. Most chapters end with a set of computer projects that require the use of any CAS (such as Maple or Mathematica) that reinforce ideas and provide insight into more advanced problems.

Comprehensive coverage of frequently used integrals, functions and fundamental mathematical results Contents selected and organized to suit the needs of students, scientists, and engineers

Contains tables of Laplace and Fourier transform pairs
New section on numerical approximation
New section on the z-transform
Easy reference system

Market_Desc: · Physicists and Engineers· Students in Physics and Engineering
Special Features: ·

Covers everything from Linear Algebra, Calculus, Analysis, Probability and Statistics, to ODE, PDE, Transforms and more· Emphasizes intuition and computational abilities· Expands the material on DE and multiple integrals· Focuses on the applied side, exploring material that is relevant to physics and engineering· Explains each concept in clear, easy-to-understand steps
About The Book: The book

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provides a comprehensive introduction to the areas of mathematical physics. It combines all the essential math concepts into one compact, clearly written reference. This book helps readers gain a solid foundation in the many areas of mathematical methods in order to achieve a basic competence in advanced physics, chemistry, and engineering. This book presents balanced treatment of transport phenomena and equal emphasis on mass transport, momentum transport and energy transport. It includes extensive reference to applications of material covered and the addition of appendices on applied mathematics topics, the Boltzmann equation, and a summary of the basic equations in several coordinate systems. 'Transport phenomena' offers literature citations throughout so you and your students know where to find additional material. It contains - Transport properties in two-phase systems; Boundary-layer theory; Heat and mass transfer coefficients; Dimensional analysis and scaling.

Dynamics systems (living organisms, electromechanical and industrial systems, chemical and technological processes, market and ecology, and so forth) can be considered and analyzed using information and systems theories. For example, adaptive human behavior can be studied using automatic feedback control. As an illustrative example, the driver controls a car changing the

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speed and steering wheels using incoming information, such as traffic and road conditions. This book focuses on the most important and manageable topics in applied multivariable control with application to a wide class of electromechanical dynamic systems. A large spectrum of systems, familiar to electrical, mechanical, and aerospace students, engineers, and scholars, are thoroughly studied to build the bridge between theory and practice as well as to illustrate the practical application of control theory through illustrative examples. It is the author's goal to write a book that can be used to teach undergraduate and graduate classes in automatic control and nonlinear control at electrical, mechanical, and aerospace engineering departments. The book is also addressed to engineers and scholars, and the examples considered allow one to implement the theory in a great variety of industrial systems. The main purpose of this book is to help the reader grasp the nature and significance of multivariable control.

Drawing on the author's 25+ years of teaching experience, *Signals and Systems: A MATLAB® Integrated Approach* presents a novel and comprehensive approach to understanding signals and systems theory. Many texts use MATLAB® as a computational tool, but Alkin's text employs MATLAB both computationally and pedagogically to provide interactive, visual reinforcement of the

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fundamentals, including the characteristics of signals, operations used on signals, time and frequency domain analyses of systems, continuous-time and discrete-time signals and systems, and more. In addition to 350 traditional end-of-chapter problems and 287 solved examples, the book includes hands-on MATLAB modules consisting of: 101 solved MATLAB examples, working in tandem with the contents of the text itself 98 MATLAB homework problems (coordinated with the 350 traditional end-of-chapter problems) 93 GUI-based MATLAB demo programs that animate key figures and bring core concepts to life 23 MATLAB projects, more involved than the homework problems (used by instructors in building assignments) 11 sections of standalone MATLAB exercises that increase MATLAB proficiency and enforce good coding practices Each module or application is linked to a specific segment of the text to ensure seamless integration between learning and doing. A solutions manual, all relevant MATLAB code, figures, presentation slides, and other ancillary materials are available on an author-supported website or with qualifying course adoption. By involving students directly in the process of visualization, Signals and Systems: A MATLAB® Integrated Approach affords a more interactive—thus more effective—solution for a one- or two-semester course on signals and systems at the junior or senior level.

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Signal processing arises in the design of such diverse systems as communications, sonar, radar, electrooptical, navigation, electronic warfare and medical imaging systems. It is also used in many physical sciences, such as geophysics, acoustics, and meteorology, among many others. The common theme is to extract and estimate the desired signals, which are mixed with a variety of noise sources and disturbances. Signal processing involves system analysis, random processes, statistical inferences, and software and hardware implementation. The purpose of this book is to provide an elementary, informal introduction, as well as a comprehensive account of principles of random signal processing, with emphasis on the computational aspects. This book covers linear system analysis, probability theory, random signals, spectral analysis, estimation, filtering, and detection theory. It can be used as a text for a course in signal processing by under graduates and beginning graduate students in engineering and science and also by engineers and scientists engaged in signal analysis, filtering, and detection. Part of the book has been used by the author while teaching at the State University of New York at Buffalo and California State University at Long Beach. An attempt has been made to make the book self-contained and straight forward, with the hope that readers with varied backgrounds can appreciate and apply principles of signal processing.

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Chapter 1 provides a brief review of linear analysis of deterministic signals.

The aim of this book is to impart a sound understanding, both physical and mathematical, of the fundamental theory of vibration and its applications. The book presents in a simple and systematic manner techniques that can easily be applied to the analysis of vibration of mechanical and structural systems. Unlike other texts on vibrations, the approach is general, based on the conservation of energy and Lagrangian dynamics, and develops specific techniques from these foundations in clearly understandable stages. Suitable for a one-semester course on vibrations, the book presents new concepts in simple terms and explains procedures for solving problems in considerable detail.

"A longtime classic text in applied mathematics, this volume also serves as a reference for undergraduate and graduate students of engineering. Topics include real variable theory, complex variables, linear analysis, partial and ordinary differential equations, and other subjects. Answers to selected exercises are provided, along with Fourier and Laplace transformation tables and useful formulas. 1978 edition"--

This book is designed to meet the complete requirements of Engineering Mathematics course of undergraduate syllabus, The book consists of seven chapters viz. infinite Series, Matrices, Expansion of

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Functions, Asymptotes, Curvature, Partial Differentiation, Multiple Integrals, Each chapter is treated in systematic, logical and lucid manner, All these chapters are independent units in themselves. The students can go through the book picking up any chapter at any given times, without referring to other chapters, Hints, where ever necessary and answers of the questions in the exercises are given at the end of each exercise, Most of the questions-solved as well as unsolved-have been picked up from the examination papers of different universities and professional examinations, There are fully worked out examples and graded exercises (with answers) aimed at preparing the student for examination as well as higher studies, The authors have illustrated various methods to solve particular problems.

Based on the experience and the lecture notes of the authors while teaching Mathematics courses for more than four decades. This comprehensive textbook covers the material for one semester core course in mathematics for Engineering students. The emphasis is on the presentation of fundamentals and theoretical concepts in an intelligible and easy to understand manner. Graded sets of examples (in text) and problems (in exercises) are used to explain each theoretical concept and application of these concepts in problem solving. Answers for every problem and hints for difficult problems are provided.

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This text offers a logical and lucid presentation of both theory and techniques for problem solving to motivate the students in the study and application of mathematics to solve Engineering problems.

The Primary Goal of this hand book is to provided in a simple and way,a concise and coherent presentation of the core material ,namely,the key terminology,fundamental concepts,principles,laws,facts,figures,formulase,mathematical methods and applications of electrical and electronics engineering.A necessary corollary objective of this handbook is to prepare the reader for specialist literature.The material presented in this handbook is intended to serve as a plateform from where the reader can launch to an exploration of specialised field of interest.

This textbook, first published in 2006, provides the student of aerospace, civil and mechanical engineering with all the fundamentals of linear structural dynamics analysis. It is designed for an advanced undergraduate or first-year graduate course. This textbook is a departure from the usual presentation in two important respects. First, descriptions of system dynamics are based on the simpler to use Lagrange equations. Second, no organizational distinctions are made between multi-degree of freedom systems and single-degree of freedom systems. The textbook is organized on the basis of first writing structural equation systems of

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motion, and then solving those equations mostly by means of a modal transformation. The text contains more material than is commonly taught in one semester so advanced topics are designated by an asterisk. The final two chapters can also be deferred for later studies. The text contains numerous examples and end-of-chapter exercises.

This work is based on the experience and notes of the authors while teaching mathematics courses to engineering students at the Indian Institute of Technology, New Delhi. It covers syllabi of two core courses in mathematics for engineering students.

Market_Desc: · Engineers· Computer Scientists· Physicists· Students · Professors Special Features: ·

Updated design and illustrations throughout·

Emphasize current ideas, such as stability, error estimation, and structural problems of algorithms·

Focuses on the basic principles, methods and results in modeling, solving, and interpreting

problems· More emphasis on applications and qualitative methods About The Book: This Student

Solutions Manual that is designed to accompany Kreyszig's Advanced Engineering Mathematics, 8th edition provides students with detailed solutions to odd-numbered exercises from the text. Thoroughly updated and streamlined to reflect new

developments in the field, the ninth edition of this bestselling text features modern engineering applications and the uses of technology. Kreyszig

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introduces engineers and computer scientists to advanced math topics as they relate to practical problems. The material is arranged into seven independent parts: ODE; Linear Algebra, Vector Calculus; Fourier Analysis and Partial Differential Equations; Complex Analysis; Numerical methods; Optimization, graphs; and Probability and Statistics. This text is a guide how to solve problems in which viscoelasticity is present using existing commercial computational codes. The book gives information on codes' structure and use, data preparation and output interpretation and verification. The first part of the book introduces the reader to the subject, and to provide the models, equations and notation to be used in the computational applications. The second part shows the most important Computational techniques: Finite elements formulation, Boundary elements formulation, and presents the solutions of Viscoelastic problems with Abaqus.

For Engineering students & also useful for competitive Examination.

Focusing on the application of mathematics to chemical engineering, Applied Mathematical Methods for Chemical Engineers, Second Edition addresses the setup and verification of mathematical models using experimental or other independently derived data. An expanded and updated version of its well-respected predecessor, this book uses worked examples to illustrate several mathematical methods that are

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essential in successfully solving process engineering problems. The book first provides an introduction to differential equations that are common to chemical engineering, followed by examples of first-order and linear second-order ordinary differential equations (ODEs). Later chapters examine Sturm–Liouville problems, Fourier series, integrals, linear partial differential equations (PDEs), and regular perturbation. The author also focuses on examples of PDE applications as they relate to the various conservation laws practiced in chemical engineering. The book concludes with discussions of dimensional analysis and the scaling of boundary value problems and presents selected numerical methods and available software packages. New to the Second Edition · Two popular approaches to model development: shell balance and conservation law balance · One-dimensional rod model and a planar model of heat conduction in one direction · Systems of first-order ODEs · Numerical method of lines, using MATLAB® and Mathematica where appropriate This invaluable resource provides a crucial introduction to mathematical methods for engineering and helps in choosing a suitable software package for computer-based algebraic applications.

George Thomas' clear precise calculus text with superior applications defined the modern-day calculus course. This proven text gives students the solid base of material they will need to succeed in math, science, and engineering programs.

This fully revised and updated third edition covers the physical and mathematical fundamentals of vibration

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analysis, including single degree of freedom, multi-degree of freedom, and continuous systems. A new chapter on special topics that include motion control, impact dynamics, and nonlinear dynamics is added to the new edition. In a simple and systematic manner, the book presents techniques that can easily be applied to the analysis of vibration of mechanical and structural systems. Suitable for a one-semester course on vibrations, the book presents the new concepts in simple terms and explains procedures for solving problems in considerable detail. It contains numerous exercises, examples and end-of-chapter problems.

The topics of this set of student-oriented books are presented in a discursive style that is readable and easy to follow. Numerous clearly stated, completely worked out examples together with carefully selected problem sets with answers are used to enhance students' understanding and manipulative skill. The goal is to help students feel comfortable and confident in using advanced mathematical tools in junior, senior, and beginning graduate courses.

Recent trends in engineering show increased emphasis on integrated analysis, design, and control of advanced electromechanical systems, and their scope continues to expand. Mechatronics-a breakthrough concept-has evolved to attack, integrate, and solve a variety of emerging problems in engineering, and there appears to be no end to its application. It has become essential for all engineers to understand its basic theoretical standpoints and practical applications.

Electromechanical Systems, Electric Machines, and

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Applied Mechatronics presents a unique combination of traditional engineering topics and the latest technologies, integrated to stimulate new advances in the analysis and design of state-of-the-art electromechanical systems.

With a focus on numerical and analytical methods, the author develops the rigorous theory of electromechanical systems and helps build problem-solving skills. He also stresses simulation as a critical aspect of developing and prototyping advanced systems. He uses the MATLABTM environment for his examples and includes a

MATLABTM diskette with the book, thus providing a solid introduction to this standard engineering tool. Readable, interesting, and accessible, *Electromechanical Systems, Electric Machines, and Applied Mechatronics* develops a thorough understanding of the integrated perspectives in the design and analysis of electromechanical systems. It covers the basic concepts in mechatronics, and with numerous worked examples, prepares the reader to use the results in engineering practice. Readers who master this book will know what they are doing, why they are doing it, and how to do it.

Thoroughly Updated, Zill'S Advanced Engineering Mathematics, Third Edition Is A Compendium Of Many Mathematical Topics For Students Planning A Career In Engineering Or The Sciences. A Key Strength Of This Text Is Zill'S Emphasis On Differential Equations As Mathematical Models, Discussing The Constructs And Pitfalls Of Each. The Third Edition Is Comprehensive, Yet Flexible, To Meet The Unique Needs Of Various Course Offerings Ranging From Ordinary Differential Equations To Vector Calculus. Numerous New Projects

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Contributed By Esteemed Mathematicians Have Been Added. Key Features O The Entire Text Has Been Modernized To Prepare Engineers And Scientists With The Mathematical Skills Required To Meet Current Technological Challenges. O The New Larger Trim Size And 2-Color Design Make The Text A Pleasure To Read And Learn From. O Numerous NEW Engineering And Science Projects Contributed By Top Mathematicians Have Been Added, And Are Tied To Key Mathematical Topics In The Text. O Divided Into Five Major Parts, The Text'S Flexibility Allows Instructors To Customize The Text To Fit Their Needs. The First Eight Chapters Are Ideal For A Complete Short Course In Ordinary Differential Equations. O The Gram-Schmidt Orthogonalization Process Has Been Added In Chapter 7 And Is Used In Subsequent Chapters. O All Figures Now Have Explanatory Captions. Supplements O Complete Instructor'S Solutions: Includes All Solutions To The Exercises Found In The Text. Powerpoint Lecture Slides And Additional Instructor'S Resources Are Available Online. O Student Solutions To Accompany Advanced Engineering Mathematics, Third Edition: This Student Supplement Contains The Answers To Every Third Problem In The Textbook, Allowing Students To Assess Their Progress And Review Key Ideas And Concepts Discussed Throughout The Text. ISBN: 0-7637-4095-0

Applied Engineering Analysis Tai-Ran Hsu, San Jose State University, USA A resource book applying mathematics to solve engineering problems Applied Engineering Analysis is a concise textbook which

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demonstrates how to apply mathematics to solve engineering problems. It begins with an overview of engineering analysis and an introduction to mathematical modeling, followed by vector calculus, matrices and linear algebra, and applications of first and second order differential equations. Fourier series and Laplace transform are also covered, along with partial differential equations, numerical solutions to nonlinear and differential equations and an introduction to finite element analysis. The book also covers statistics with applications to design and statistical process controls. Drawing on the author's extensive industry and teaching experience, spanning 40 years, the book takes a pedagogical approach and includes examples, case studies and end of chapter problems. It is also accompanied by a website hosting a solutions manual and PowerPoint slides for instructors. Key features: Strong emphasis on deriving equations, not just solving given equations, for the solution of engineering problems. Examples and problems of a practical nature with illustrations to enhance student's self-learning. Numerical methods and techniques, including finite element analysis. Includes coverage of statistical methods for probabilistic design analysis of structures and statistical process control (SPC). Applied Engineering Analysis is a resource book for engineering students and professionals to learn how to apply the mathematics experience and skills that they have already acquired to their engineering profession for innovation, problem solving, and decision making. This text aims to provide students in engineering with a sound

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presentation of post-calculus mathematics. It features numerous examples, many involving engineering applications, and contains all mathematical techniques for engineering degrees. The book also contains over 5000 exercises, which range from routine practice problems to more difficult applications. In addition, theoretical discussions illuminate principles, indicate generalizations and establish limits within which a given technique may or may not be safely used.

Pedagogical insights gained through 30 years of teaching applied mathematics led the author to write this set of student-oriented books. Topics such as complex analysis, matrix theory, vector and tensor analysis, Fourier analysis, integral transforms, ordinary and partial differential equations are presented in a discursive style that is readable and easy to follow. Numerous clearly stated, completely worked out examples together with carefully selected problem sets with answers are used to enhance students' understanding and manipulative skill. The goal is to help students feel comfortable and confident in using advanced mathematical tools in junior, senior, and beginning graduate courses. Continuous Signals and Systems with MATLAB® offers broad, detailed, and focused comprehensive coverage of continuous linear systems, based on basic mathematical principles. It presents many solved problems from various engineering disciplines using analytical tools as well as MATLAB. This book is intended primarily for undergraduate junior and senior electrical, mechanical, aeronautical, and aerospace engineering students. Practicing engineers will also find this book useful. This book is ideal for use in a one-semester course in continuous linear systems where the instructor can easily cover all of the chapters. Each chapter presents numerous examples that illustrate each concept. Most of the worked-out examples are first solved analytically,

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and then solved using MATLAB in a clear and understandable fashion. This book concentrates on explaining the subject matter with easy-to-follow mathematical development and numerous solved examples. The book covers traditional topics and includes an extensive coverage of state-space representation and analysis. The reader does not need to be fluent in MATLAB because the examples are presented in a self-explanatory way.

The ideal review for your tensor calculus course More than 40 million students have trusted Schaum's Outlines for their expert knowledge and helpful solved problems. Written by renowned experts in their respective fields, Schaum's Outlines cover everything from math to science, nursing to language. The main feature for all these books is the solved problems. Step-by-step, authors walk readers through coming up with solutions to exercises in their topic of choice. 300 solved problems Coverage of all course fundamentals Effective problem-solving techniques Complements or supplements the major logic textbooks Supports all the major textbooks for tensor calculus courses

Combining mathematical theory, physical principles, and engineering problems, Generalized Calculus with Applications to Matter and Forces examines generalized functions, including the Heaviside unit jump and the Dirac unit impulse and its derivatives of all orders, in one and several dimensions. The text introduces the two main approaches to genera

This book presents contemporary theoretical methods in fluid flow and heat transfer, emphasizing principles of investigation and modeling of natural phenomena and engineering processes. It is organized into four parts and 12 chapters presenting classical and modern methods. Following the classical methods in Part 1, Part 2 offers in-depth coverage of analytical conjugate methods in convective heat transfer and

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peristaltic flow. Part 3 explains recent developments in numerical methods including new approaches for simulation of turbulence by direct solution of Navier-Stokes equations. Part 4 provides a wealth of applications in industrial systems, technology processes, biology, and medicine. More than a hundred examples show the applicability of the methods in such areas as nuclear reactors, aerospace, crystal growth, turbine blades, electronics packaging, optical fiber coating, wire casting, blood flow, urinary problems, and food processing. Intended for practicing engineers and students, the book balances strong formulation of problems with detailed explanations of definitions and terminology. Author comments give attention to special terms like singularity, order of magnitude, flow stability, and nonisothermicity characteristics. More than 400 exercises and questions are offered, many of which divide derivations between you and the author. For these exercises, the author describes the solution method and the results in the text, but you are directed to complete specific portions of the solutions. You then have a choice to accept the results or to further explore the underlying problem. Extensive references are provided for further study.

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