

Free Body Diagrams With Answers

This textbook is designed for introductory statics courses found in mechanical engineering, civil engineering, aeronautical engineering, and engineering mechanics departments. It better enables students to learn challenging material through effective, efficient examples and explanations.

Renowned for its interactive focus on conceptual understanding, its superlative problem-solving instruction, and emphasis on reasoning skills, the Fundamentals of Physics, 12th Edition, is an industry-leading resource in physics teaching. With expansive, insightful, and accessible treatments of a wide variety of subjects, including straight line motion, measurement, vectors, and kinetic energy, the book is an invaluable reference for physics educators and students.

A review of material needed to pass the AP physics 1 exam, including reviews and two full-length practice tests with explanations.

Neuromechanics of Human Movement, Fourth Edition, provides a scientific foundation to the study of human movement by exploring how the nervous system controls the actions of muscles to produce human motion in relation to biomechanical principles.

As NTA introduces Numeric Answer Questions in JEE Main, Disha launches the Questions' the 3rd latest updated edition of 'New Pattern NTA JEE Main Quick Guide in Physics with Numeric Answer Questions'. This study material is developed for quick revision and practice of the complete syllabus of the JEE Main Exam in a short span of 40 days. The book can prove to be the ideal material for class 12 students as they can utilise this book to revise their preparation

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immediately after the board exams. The book contains 27 chapters of class 11 & 12 and each Chapter contains: # JEE Main 6 Years at a Glance i.e., JEE Main (2019 - 2014) with TOPIC-WISE Analysis. # Detailed Concept Maps covers entire JEE Syllabus for speedy revision. # IMPORTANT/ CRITICAL Points of the Chapter for last minute revision. # TIPS to PROBLEM SOLVING – to help students to solve Problems in shortest possible time. # Exercise 1 CONCEPT BUILDER - A Collection of Important Topic-wise MCQs to Build Your Concepts. # Exercise 2 CONCEPT APPLICATOR – A Collection of Quality MCQs that helps sharpens your concept application ability. # Exercise 3 Numeric Answer Questions – A Collection of Quality Numeric Answer Questions as per the new pattern of JEE. # Answer Keys & Detailed Solutions of all the Exercises and Past years problems are provided at the end of the chapter. This handy book serves as an introduction to the course of Statics and is intended for first year students taking a degree or diploma in engineering. Its main objective is to provide simple and friendly techniques necessary in the learning of Statics. Focus is placed on the application of basic algebra, trigonometry and elementary calculus to solve problems with extra emphasis on the Free Body Diagram. The following are some distinctive features of this book: Rigorous and detailed approach to solve resultant and equilibrium of particles. Emphasis on the techniques of drawing Free Body Diagrams. Thoroughly cover the moment equation to solve problems comprising statics of rigid bodies. Addressing various effective techniques to tackle analysis of structure problems. Friction topics, centroids and centre of gravities of two and three dimensional composite bodies are also included. It is hoped that this effort, which is an attempt to guide students through a learning experience in an effective manner, will be appreciated by both lecturers and students. Any comments and suggestions for improvement

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are welcome and InsyaAllah will be incorporated in the next edition. The countless prior comments and suggestions made by our colleagues and students are acknowledged and highly appreciated.

This book provides a systematic and thorough overview of the classical bending members based on the theory for thin beams (shear-rigid) according to Euler-Bernoulli, and the theories for thick beams (shear-flexible) according to Timoshenko and Levinson. The understanding of basic, i.e., one-dimensional structural members, is essential in applied mechanics. A systematic and thorough introduction to the theoretical concepts for one-dimensional members keeps the requirements on engineering mathematics quite low, and allows for a simpler transfer to higher-order structural members. The new approach in this textbook is that it treats single-plane bending in the x-y plane as well in the x-z plane equivalently and applies them to the case of unsymmetrical bending. The fundamental understanding of these one-dimensional members allows a simpler understanding of thin and thick plate bending members. Partial differential equations lay the foundation to mathematically describe the mechanical behavior of all classical structural members known in engineering mechanics. Based on the three basic equations of continuum mechanics, i.e., the kinematics relationship, the constitutive law, and the equilibrium equation, these partial differential equations that describe the physical problem can be derived. Nevertheless, the fundamental knowledge from the first years of engineering education, i.e., higher mathematics, physics, materials science, applied mechanics, design, and programming skills, might be required to master this topic.

The first of a comprehensive two-volume treatment of mechanics intended for students of civil and mechanical engineering. Used for several years in courses at Bradley

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University, the text presents statics in a clear and straightforward way while emphasizing problem solving - backed by more than 350 examples used to clarify the discussion. The accompanying diskette contains EnSolve, written by the authors for solving problems in engineering mechanics. The program includes the following: - a unit converter for SI to US units and vice versa - a graphics program for plotting functions and data - a set of numerical subroutines. The graphics module boasts such features as fitting smooth splines between data, plotting regression lines and curves, and changing scales -- including from arithmetic to log and log-log.

Philpot's *Mechanics of Materials: An Integrated Learning System*, 4th Edition, helps engineering students visualize key mechanics of materials concepts better than any text available, following a sound problem solving methodology while thoroughly covering all the basics.

Take the fear out of Physics I! If the thought of studying physics makes you sweat, you can finally have something to rest easy about! *U Can: Physics I For Dummies* takes the intimidation out of this tough subject, offering approachable lessons, examples, and practice opportunities—as well as access to additional practice problems online. With this one-stop resource, you'll find friendly and accessible instruction on everything you'll encounter in your Physics I course and will gain the practice and confidence you need to score high at exam time. Inside this comprehensive study resource, how-to lessons are thoughtfully blended with practical examples and problems to help you put your

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knowledge to practice and gauge your comprehension of the physics topics presented. Lessons and practice problems are fully integrated and track to a typical Physics I course, giving you one mega-resource that combines the 'how-to' you need with the 'do it' practice you want to keep the physics anxiety at bay. Get up to speed on the basic concepts of physics Grasp physics formulas in a clear and concise manner Explore the newest discoveries in the field Access additional practice problems online If you're looking for an all-inclusive product to help with your Physics I coursework, U Can: Physics I For Dummies has it all—and then some!

EVERYTHING YOU NEED TO HELP SCORE A PERFECT 5! Ace the AP Physics 1: Algebra-Based Exam with this comprehensive study guide—including 2 full-length practice tests with complete answer explanations, thorough content reviews, targeted exam strategies, and access to our online AP Connect portal. This eBook edition has been optimized for on-screen reading with cross-linked questions, answers, and explanations. Written by the experts at The Princeton Review, Cracking the AP Physics 1 Exam arms you to take on the test and achieve your highest possible score. Everything You Need to Know to Help Achieve a High Score.

- Comprehensive content reviews for all test topics—including kinematics, dynamics, Newton's laws, work, energy, rotational motion, electrostatics, DC circuits, mechanical waves, sound, and more
- Tons of charts and figures to illustrate concepts
- Engaging activities to help you critically assess your progress
- Access to AP Connect, our online portal for helpful pre-

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college information and exam updates Practice Your Way to Excellence. • 2 full-length practice tests with detailed answer explanations • Practice drills at the end of each content review chapter • Step-by-step walk-throughs of sample questions Techniques That Actually Work. • Tried-and-true strategies to avoid traps and beat the test • Tips for pacing yourself and guessing logically • Essential tactics to help you work smarter, not harder

This revised and updated second edition is designed for the first course in mechanics of materials in mechanical, civil and aerospace engineering, engineering mechanics, and general engineering curricula. It provides a review of statics, covering the topics needed to begin the study of mechanics of materials including free-body diagrams, equilibrium, trusses, frames, centroids, and distributed loads. It presents the foundations and applications of mechanics of materials with emphasis on visual analysis, using sequences of figures to explain concepts and giving detailed explanations of the proper use of free-body diagrams. The Cauchy tetrahedron argument is included, which allows determination of the normal and shear stresses on an arbitrary plane for a general state of stress. An optional chapter discusses failure and modern fracture theory, including stress intensity factors and crack growth. Thoroughly classroom tested and enhanced by student and instructor feedback, the book adopts a uniform and systematic approach to problem solving through its strategy, solution, and discussion format in examples. Motivating applications from the various engineering fields, as well as end of chapter

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problems, are presented throughout the book.

Since the first edition of this comprehensive handbook was published ten years ago, many changes have taken place in engineering and related technologies. Now, this best-selling reference has been updated for the 21st century, providing complete coverage of classic engineering issues as well as groundbreaking new subject areas. The second edition of *The CRC Handbook of Mechanical Engineering* covers every important aspect of the subject in a single volume. It continues the mission of the first edition in providing the practicing engineer in industry, government, and academia with relevant background and up-to-date information on the most important topics of modern mechanical engineering. Coverage of traditional topics has been updated, including sections on thermodynamics, solid and fluid mechanics, heat and mass transfer, materials, controls, energy conversion, manufacturing and design, robotics, environmental engineering, economics and project management, patent law, and transportation. Updates to these sections include new references and information on computer technology related to the topics. This edition also includes coverage of new topics such as nanotechnology, MEMS, electronic packaging, global climate change, electric and hybrid vehicles, and bioengineering.

Featuring more than five hundred questions from past Regents exams with worked out solutions and detailed illustrations, this book is integrated with APlusPhysics.com website, which includes online questions and answer forums, videos, animations, and

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supplemental problems to help you master Regents Physics Essentials.

- completely covers all question-types since 2000
- exposes all “trick” questions
- provides step-by-step solutions
- most efficient method of learning, hence saves time
- examples arrange from easy-to-hard to facilitate easy absorption
- advanced trade book
- Complete edition and concise edition eBooks available

There is one Teacher's Guide which corresponds with each Student Activities Book, and consists of two parts: Answers and Instructional Aids for Teachers, and Answer Sheets.

The Answers and Instructional Aids for Teachers provides advice for how to optimize the effectiveness of the activities, as well as brief explanations and comments on each question in the student activities. The Answer Sheets may be duplicated and distributed to students as desired. Use of the Answer Sheets is particularly recommended for activities requiring a lot of graphing or drawing.

Engineering Mechanics: Statics provides students with a solid foundation of mechanics principles. This product helps students develop their problem-solving skills with an extensive variety of engaging problems related to engineering design. To help students build necessary visualization and problem-solving skills, a strong emphasis is placed on drawing free-body diagrams, the most important skill needed to solve mechanics problems.

Instant Notes Sport and Exercise Biomechanics provides a comprehensive overview of the key concepts in exercise and sport biomechanics. The kinematics of motion are

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reviewed in detail, outlining the physics of motion. Mechanical characteristics of motion, the mechanisms of injury, and the analysis of the sport technique provides a source of valuable information.

EVERYTHING YOU NEED TO HELP SCORE A PERFECT 5. Equip yourself to ace the AP Physics 1 Exam with The Princeton Review's comprehensive study guide—including thorough content reviews, targeted strategies for every question type, access to our online AP Connect portal, and 2 full-length practice tests with complete answer explanations. This eBook edition has been optimized for onscreen viewing with cross-linked questions, answers, and explanations. We don't have to tell you how tough the AP Physics 1: Algebra-Based course is to master—or how vital a stellar exam can be to making your college application competitive at the most selective schools. Written by the experts at The Princeton Review, *Cracking the AP Physics 1 Exam* arms you to take on the test and achieve your highest possible score. **Techniques That Actually Work.** • Tried-and-true strategies to avoid traps and beat the test • Tips for pacing yourself and guessing logically • Essential tactics to help you work smarter, not harder **Everything You Need to Know to Help Achieve a High Score.** • Comprehensive content reviews for all test topics—including kinematics, dynamics, Newton's laws, work, energy, rotational motion, electrostatics, DC circuits, mechanical waves, sound, and more • Tons of charts and figures to illustrate concepts • Access to AP Connect, our online portal for helpful pre-college information and exam updates **Practice Your Way to**

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Excellence. • 2 full-length practice tests with detailed answer explanations • Practice drills at the end of each content review chapter • Step-by-step walk-throughs of sample questions

New Volume 1A edition of the classic text, now more than ever tailored to meet the needs of the struggling student.

Mechanics of Materials: With Applications in Excel® covers the fundamentals of the mechanics of materials—or strength of materials—in a clear and easily understandable way. Each chapter explains the theory of the underlying principles and the applicable mathematical relations, offering examples that illustrate the application of the mathematical relations to physical situations. Then, homework problems—arranged from the simplest to the most demanding—are presented, along with a number of challenging review problems, to ensure comprehension of key concepts. What makes this book unique is that it also instills practical skills for developing Microsoft Excel applications to solve mechanics of materials problems using numerical techniques. Mechanics of Materials: With Applications in Excel® provides editable Excel spreadsheets representing all the examples featured in the text, PowerPoint lecture slides, multimedia simulations, graphics files, and a solutions manual with qualifying course adoption.

Key Message: This book aims to explain physics in a readable and interesting manner that is accessible and clear, and to teach readers by anticipating their needs and difficulties without oversimplifying. Physics is a description of reality,

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and thus each topic begins with concrete observations and experiences that readers can directly relate to. We then move on to the generalizations and more formal treatment of the topic. Not only does this make the material more interesting and easier to understand, but it is closer to the way physics is actually practiced. Key Topics: INTRODUCTION, MEASUREMENT, ESTIMATING, DESCRIBING MOTION: KINEMATICS IN ONE DIMENSION, KINEMATICS IN TWO OR THREE DIMENSIONS; VECTORS, DYNAMICS: NEWTON'S LAWS OF MOTION , USING NEWTON'S LAWS: FRICTION, CIRCULAR MOTION, DRAG FORCES, GRAVITATION AND NEWTON'S6 SYNTHESIS , WORK AND ENERGY , CONSERVATION OF ENERGY , LINEAR MOMENTUM , ROTATIONAL MOTION , ANGULAR MOMENTUM; GENERAL ROTATION , STATIC EQUILIBRIUM; ELASTICITY AND FRACTURE , FLUIDS , OSCILLATIONS , WAVE MOTION, SOUND , TEMPERATURE, THERMAL EXPANSION, AND THE IDEAL GAS LAW KINETIC THEORY OF GASES, HEAT AND THE FIRST LAW OF THERMODYNAMICS , SECOND LAW OF THERMODYNAMICS , ELECTRIC CHARGE AND ELECTRIC FIELD , GAUSS'S LAW , ELECTRIC POTENTIAL , CAPACITANCE, DIELECTRICS, ELECTRIC ENERGY STORAGE ELECTRIC CURRENTS AND RESISTANCE, DC CIRCUITS, MAGNETISM, SOURCES OF MAGNETIC FIELD,

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ELECTROMAGNETIC INDUCTION AND FARADAY'S LAW, INDUCTANCE, ELECTROMAGNETIC OSCILLATIONS, AND AC CIRCUITS, MAXWELL'S EQUATIONS AND ELECTROMAGNETIC WAVES, LIGHT: REFLECTION AND REFRACTION, LENSES AND OPTICAL INSTRUMENTS, THE WAVE NATURE OF LIGHT; INTERFERENCE, DIFFRACTION AND POLARIZATION, SPECIAL THEORY OF RELATIVITY, EARLY QUANTUM THEORY AND MODELS OF THE ATOM, QUANTUM MECHANICS, QUANTUM MECHANICS OF ATOMS, MOLECULES AND SOLIDS, NUCLEAR PHYSICS AND RADIOACTIVITY, NUCLEAR ENERGY: EFFECTS AND USES OF RADIATION, ELEMENTARY PARTICLES, ASTROPHYSICS AND COSMOLOGY

Market Description: This book is written for readers interested in learning the basics of physics.

Activities The MOP activities all have the same basic structure: Purpose and Expected Outcome In this section, we tell students the specific concepts, principles, and other ideas that will be raised and addressed during the activity. This section also tells students what they are expected to learn Prior Experience / Knowledge Needed first list for students the concepts and principles they should know or be familiar with before attempting the activity. Then, if necessary, we provide any additional background needed to do the activity Main Activity contains the specific questions and problems that probe students' understanding

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and prepare them to make sense out of the ideas Reflection Main Activity, students re-examine their answers to look for patterns. They are also asked to generalize, abstract, and relate concepts to the situations they have studied Here, in one volume, is all the architect needs to know to participate in the entire process of designing structures. Emphasizing bestselling author Edward Allen's graphical approach, the book enables you to quickly determine the desired form of a building or other structure and easily design it without the need for complex mathematics. This unique text teaches the whole process of structural design for architects, including selection of suitable materials, finding a suitable configuration, finding forces and size members, designing appropriate connections, and proposing a feasible method of erection. Chapters are centered on the design of a whole structure, from conception through construction planning.

Renowned for its interactive focus on conceptual understanding, its superlative problem-solving instruction, and emphasis on reasoning skills, the Fundamentals of Physics: Volume 1, 12th Edition, is an industry-leading resource in physics teaching. With expansive, insightful, and accessible treatments of a wide variety of subjects, including straight line motion, measurement, vectors, and kinetic energy, the book is an invaluable reference for physics educators and students.

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In the first volume of this two-volume set, the authors discuss subjects including gravitation, wave theory, entropy and the Second Law of Thermodynamics, and more.

"5 full-length practice tests (4 in the book & 1 online) with complete answer explanations"--Cover.

University Physics is designed for the two- or three-semester calculus-based physics course. The text has been developed to meet the scope and sequence of most university physics courses and provides a foundation for a career in mathematics, science, or engineering. The book provides an important opportunity for students to learn the core concepts of physics and understand how those concepts apply to their lives and to the world around them. Due to the comprehensive nature of the material, we are offering the book in three volumes for flexibility and efficiency. Coverage and Scope Our University Physics textbook adheres to the scope and sequence of most two- and three-semester physics courses nationwide. We have worked to make physics interesting and accessible to students while maintaining the mathematical rigor inherent in the subject. With this objective in mind, the content of this textbook has been developed and arranged to provide a logical progression from fundamental to more advanced concepts, building upon what students have already learned and emphasizing

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connections between topics and between theory and applications. The goal of each section is to enable students not just to recognize concepts, but to work with them in ways that will be useful in later courses and future careers. The organization and pedagogical features were developed and vetted with feedback from science educators dedicated to the project.

VOLUME I Unit 1: Mechanics
Chapter 1: Units and Measurement Chapter 2: Vectors Chapter 3: Motion Along a Straight Line Chapter 4: Motion in Two and Three Dimensions Chapter 5: Newton's Laws of Motion Chapter 6: Applications of Newton's Laws Chapter 7: Work and Kinetic Energy Chapter 8: Potential Energy and Conservation of Energy Chapter 9: Linear Momentum and Collisions Chapter 10: Fixed-Axis Rotation Chapter 11: Angular Momentum Chapter 12: Static Equilibrium and Elasticity Chapter 13: Gravitation Chapter 14: Fluid Mechanics Unit 2: Waves and Acoustics Chapter 15: Oscillations Chapter 16: Waves Chapter 17: Sound

Includes all the core curriculum topics, this physics ebook for kids 12+ is the perfect support for home and school learning. Breaking down the information into easy, manageable chunks, Super Simple Physics covers everything from atoms to astronomy and forces to flotation. Each topic is fully illustrated to support the information, make the facts crystal clear, and bring the science to life. For key ideas, a "How it works" panel explains the theory with the help of bright, simple

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graphics. And for revision, a handy "Key facts" box provides a simple summary you can check back on later. With clear, concise coverage of all the core physics topics, Super Simple Physics is the perfect accessible e-guide to science for children that will support classwork and make studying for tests the easiest it's ever been.

Activities same basic structure Outcomprinciples, and other ideas that will be raised and addressed during the activity. This section also tells students what they are expected to learn Knowledge Neede they should know or be familiar with before attempting the activity. Then, if necessary, we provide any additional background needed to do the activity Main Activity section contains the specific questions and problems that probe students' understanding and prepare them to make sense out of the ideas Reflection finishing the Main Activity, students re-examine their answers to look for patterns. They are also asked to generalize, abstract, and relate concepts to the situations they have studied

A practical, up-to-date introduction on truss analysis, application and design. Describes the influence of trusses on design development as well as the means for design and detailing of truss construction utilizing contemporary building technologies. Illustrations include both historical and recent uses of trusses.

This introductory book covers the most fundamental aspects of linear vibration analysis for mechanical engineering students and engineers. Consisting of five major topics,

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each has its own chapter and is aligned with five major objectives of the book. It starts from a concise, rigorous and yet accessible introduction to Lagrangian dynamics as a tool for obtaining the governing equation(s) for a system, the starting point of vibration analysis. The second topic introduces mathematical tools for vibration analyses for single degree-of-freedom systems. In the process, every example includes a section Exploring the Solution with MATLAB. This is intended to develop student's affinity to symbolic calculations, and to encourage curiosity-driven explorations. The third topic introduces the lumped-parameter modeling to convert simple engineering structures into models of equivalent masses and springs. The fourth topic introduces mathematical tools for general multiple degrees of freedom systems, with many examples suitable for hand calculation, and a few computer-aided examples that bridges the lumped-parameter models and continuous systems. The last topic introduces the finite element method as a jumping point for students to understand the theory and the use of commercial software for vibration analysis of real-world structures.

The 2004 Physics Education Research (PER) Conference brought together researchers in how we teach physics and how it is learned. Student understanding of concepts, the efficacy of different pedagogical techniques, and the importance of student attitudes toward physics and knowledge were all discussed. These Proceedings capture an important snapshot of the PER community, containing an

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incredibly broad collection of research papers of work in progress.

Designed for a first course in strength of materials, Applied Strength of Materials has long been the bestseller for Engineering Technology programs because of its comprehensive coverage, and its emphasis on sound fundamentals, applications, and problem-solving techniques. The combination of clear and consistent problem-solving techniques, numerous end-of-chapter problems, and the integration of both analysis and design approaches to strength of materials principles prepares students for subsequent courses and professional practice. The fully updated Sixth Edition. Built around an educational philosophy that stresses active learning, consistent reinforcement of key concepts, and a strong visual component, Applied Strength of Materials, Sixth Edition continues to offer the readers the most thorough and understandable approach to mechanics of materials.

During the past 20 years, the field of mechanical engineering has undergone enormous changes. These changes have been driven by many factors, including: the development of computer technology worldwide competition in industry improvements in the flow of information satellite communication real time monitoring increased energy efficiency robotics automatic control increased sensitivity to environmental impacts of human activities advances in design and manufacturing methods These developments have put more stress on mechanical engineering education, making it increasingly difficult to cover all the topics that a professional engineer will need in his or her career.

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As a result of these developments, there has been a growing need for a handbook that can serve the professional community by providing relevant background and current information in the field of mechanical engineering. The CRC Handbook of Mechanical Engineering serves the needs of the professional engineer as a resource of information into the next century.

Perfect for anyone (students or engineers) preparing for the FE exam; Endorsed by a former Director of Exams from the NCEES Describes exam structure, exam day strategies, exam scoring, and passing rate statistics; All problems in SI units in line with the new exam format Covers all the topics on the FE exam, carefully matching exam structure: Mathematics, Statics, Dynamics, Mechanics of Materials, Fluid Mechanics, Thermodynamics, Electrical Circuits, Materials Engineering, Chemistry, Computers, Ethics, and Engineering Economy; Each chapter is written by an expert in the field, contains a thorough review of the topic as covered on the test, and ends with practice problems and detailed solutions Includes a complete eight-hour sample exam with 120 morning (AM) questions, 60 general afternoon (PM) questions, and complete step-by-step solutions to all problems; 918 problems total: 60% text; 40% problems and solutions

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