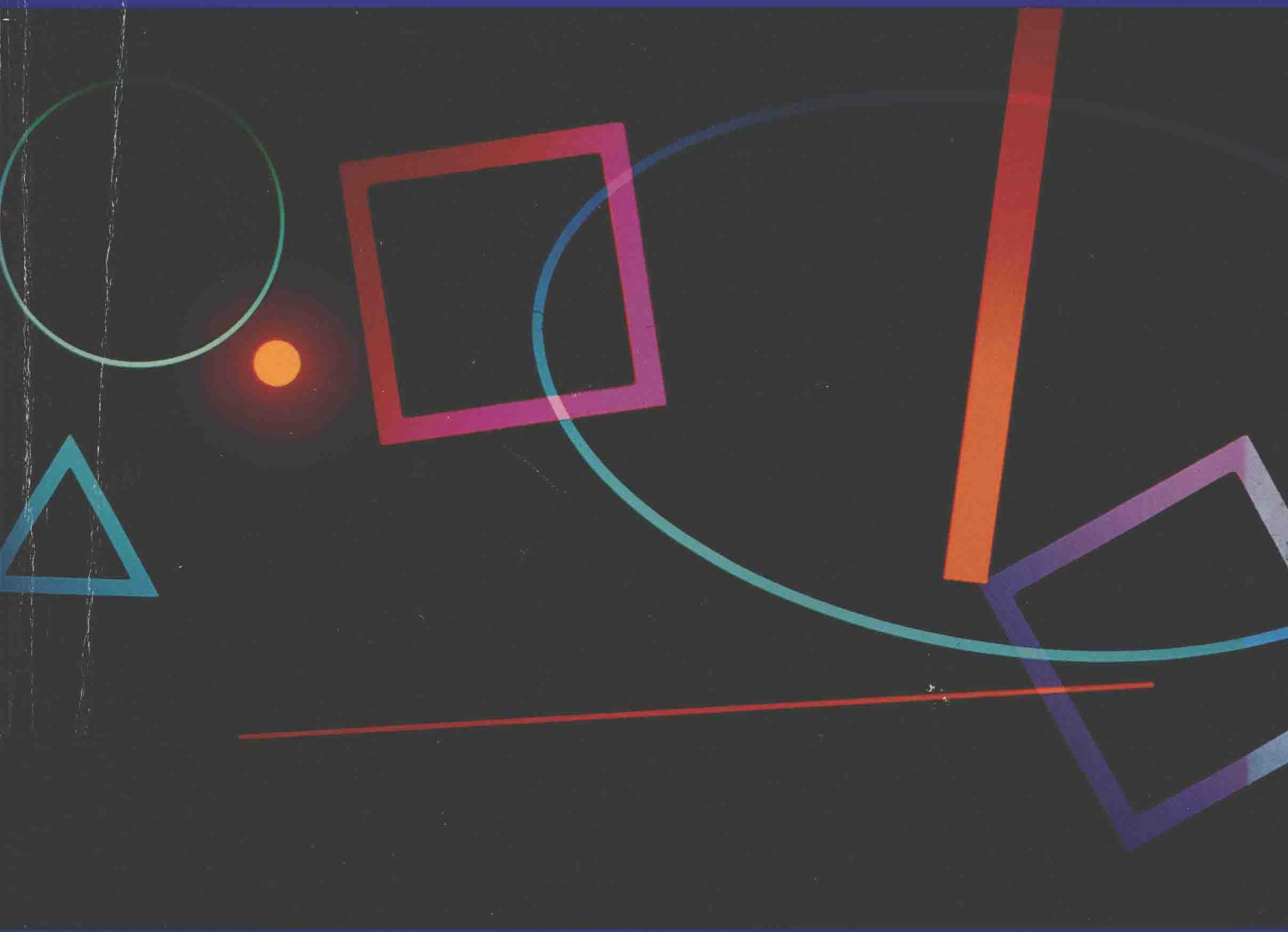


Introductory Algebra

An Applied Approach

Third Edition



■ Aufmann / Barker

Introductory Algebra

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THIRD EDITION

Richard N. Aufmann

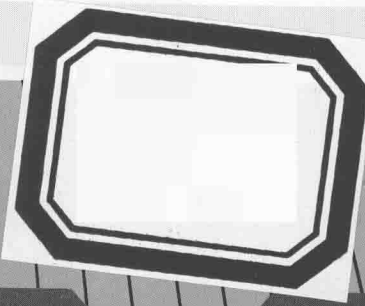
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Introductory Algebra

An Applied Approach

Preface

The third edition of *Introductory Algebra: An Applied Approach* provides mathematically sound and comprehensive coverage of the topics considered essential in an introductory algebra course. Our strategy in preparing this revision has been to build on the successful features of the second edition, features designed to enhance the student's mastery of math skills. In addition, we have expanded the ancillary package for both the instructor and the student by adding transparencies and videos.

Features

The Interactive Approach

Instructors have long recognized the need for a text that requires the student to use a skill as it is being taught. *Introductory Algebra: An Applied Approach* uses an interactive technique that meets this need. Each section is divided into objectives, and every objective contains one or more sets of matched-pair examples. The first example in each set is worked out; the second example is not. By solving this second problem, the student interacts with the text. The complete worked-out solutions to these examples are provided in an appendix at the end of the book, so the student can obtain immediate feedback on and reinforcement of the skill being learned.

Emphasis on Problem-Solving Strategies

Introductory Algebra: An Applied Approach features a carefully developed approach to problem solving that emphasizes developing strategies to solve problems. For each type of word problem contained in the text, the student is prompted to use a "strategy step" before performing the actual manipulation of numbers and variables. By developing problem-solving strategies, the student will know better how to analyze and solve those word problems encountered in an introductory algebra course.

Applications

The traditional approach to teaching or reviewing algebra covers only the straightforward manipulation of numbers and variables and thereby fails to teach students the practical value of algebra. By contrast, *Introductory Algebra: An Applied Approach* emphasizes applications. Wherever appropriate, the last objective in each section presents applications that require the student to use the skills covered in that section to solve practical problems. Also, all of Chapter 4, "Solving Equations: Applications," and portions of several other chapters are devoted entirely to applications. This carefully integrated applied approach generates awareness on the student's part of the value of algebra as a real-life tool.

Complete Integrated Learning System Organized by Objectives

Each chapter begins with a list of the learning objectives included within that chapter. Each of the objectives is then restated in the chapter to remind the student of the current topic of discussion. The same objectives that organize the

text organize each ancillary. The Solutions Manual, Computerized Test Generator, Computer Tutor™, Videos, Transparencies, Test Bank, and the Printed Testing Program have all been prepared so that both the student and instructor can easily connect all of the different aids.

Exercises

There are more than 6000 exercises in the text, grouped in the following categories:

- **End-of-section exercise sets**, which are keyed to the corresponding learning objectives, provide ample practice and review of each skill.
- **Chapter review exercises**, which appear at the end of each chapter, help the student integrate all of the skills presented in the chapter.
- **Chapter tests**, which appear at the end of each chapter, are typical one-hour exams that the student can use to prepare for an in-class test.
- **Cumulative review exercises**, which appear at the end of each chapter (beginning with Chapter 2), help the student retain math skills learned in earlier chapters.
- **Final exam**, which follows the last chapter, can be used as a review item or practice final.
- **Calculator exercises**, which appear in the end-of-section exercises, are included throughout the text. These exercises provide the student with the opportunity to practice using a hand-held calculator and are identified by a special color box printed over the exercise number for each calculator exercise.

Calculator and Computer Enrichment Topics

Each chapter also contains optional calculator or computer enrichment topics. Calculator topics provide the student with valuable key-stroking instructions and practice in using a hand-held calculator. Computer topics correspond directly to the programs found on the Math ACE (Additional Computer Exercises) Disk. These topics range from solving first-degree equations to graphing linear equations in two variables.

New To This Edition

Topical Coverage

In Chapter 5, negative exponents are introduced before division of monomials. With this change, a single rule for division of monomials can be stated.

The coverage of factoring has been expanded to include the ac method of factoring as an alternative to factoring by using trial factors.

In Chapter 7, a wider variety of exercises with complex fractions have been added.

The introduction to *Systems of Equations* has been rewritten to emphasize the different types of systems of equations.

The section on radical equations has been enhanced and now includes exercises that require squaring twice to find the solution of an equation.

Keeping with our commitment to applications, over two hundred word problems have been rewritten to reflect contemporary situations.

Chapter Review and Chapter Test

There is now a Chapter Review and a Chapter Test at the end of each chapter. Problems in the Chapter Review are grouped according to the section heads for that chapter. Problems in the Chapter Test are not divided into sections or objectives. Instead the objective references are given in the Answer Section at the back of the book so the student will know which objective to restudy if necessary.

New Testing Program

Both the Computerized Testing program and the Printed Testing Program have been completely rewritten to provide instructors with the option of creating countless new tests.

Supplements For The Student

Two computerized study aids, the Computer TutorTM and the Math ACE (Additional Computer Exercises) Disk have been carefully designed for the student. The Computer TutorTM has been expanded to include nine “you-try-it” examples with specific help screens for each lesson.

The COMPUTER TUTORTM

The Computer TutorTM is an interactive instructional microcomputer program for student use. Each learning objective in the text is supported by a lesson on the Computer TutorTM. As a reminder of this, a small computer icon appears to the right of each objective title in the text. Lessons on the tutor provide additional instruction and practice and can be used in several ways: (1) to cover material the student missed because of absence from class; (2) to repeat instruction on the skill or concept that the student has not yet mastered; or (3) to review material in preparation for examinations. This tutorial program is available for the IBM PC and compatible computers.

Math ACE (Additional Computer Exercises) Disk

The Math ACE Disk contains a number of computational and drill-and-practice programs that correspond to selected Calculator and Computer Enrichment Topics in the text. These programs are available for the IBM PC and compatible computers.

Supplements For The Instructor

Introductory Algebra: An Applied Approach has an unusually complete set of teaching aids for the instructor.

Instructor's Annotated Edition

The Instructor's Annotated Edition is an exact replica of the student text except that the answers to all of the exercises are printed in color next to the problems.

Solutions Manual

The Solutions Manual contains worked-out solutions for all end-of-section exercise sets, chapter reviews, chapter tests, cumulative reviews, and the final exam.

Instructor's Resource Manual/Testing Program

The Instructor's Resource Manual/Testing Program contains the printed testing program, which is the first of three sources of testing material available to users of *Introductory Algebra: An Applied Approach*. Eight printed tests (in two formats—free response and multiple choice) are provided for each chapter, as are cumulative and final exams. In addition, the Instructor's Manual includes the documentation for all the software ancillaries (ACE, the Computer Tutor, and the Instructor's Computerized Test Generator) as well as suggested course sequences and class assignments.

Instructor's Computerized Test Generator

The Instructor's Computerized Test Generator is the second source of testing material for use with *Introductory Algebra: An Applied Approach*. The database contains over 1800 new test items. These questions are unique to the test generator and do not repeat items provided in the Instructor's Resource Manual/Testing Program. Organized according to the keyed objectives in the text, the Test Generator is designed to produce an unlimited number of tests for each chapter of the text, including cumulative tests and final exams. It is available for the IBM PC or compatible computers with editing capabilities for all nongraphic questions.

Printed Test Bank

The Printed Test Bank, the third component of the testing materials, is a print-out of all items in the Instructor's Computerized Test Generator. Instructors using the Test Generator can use the test bank to select specific items from the database. Instructors who do not have access to a computer can use the test bank to select items to be included on a test being prepared by hand.

Videotapes

Approximately 33 half-hour videotape lessons accompany *Introductory Algebra: An Applied Approach*. These lessons follow the format and style of the text and are closely tied to specific sections of the text.

Transparencies

Approximately 200 transparencies accompany *Introductory Algebra: An Applied Approach*. These transparencies contain the complete solution to every "you-try-it" example in the text.

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To the Student

Many students feel that they will never understand math while others appear to do very well with little effort. Often times what makes the difference is that successful students take an active role in the learning process.

Learning mathematics requires your *active* participation. Although doing homework is one way you can actively participate, it is not the only way. First, you must attend class regularly and become an active participant. Secondly, you must become actively involved with the textbook.

Introductory Algebra: An Applied Approach was written and designed with you in mind as a participant. Here are some suggestions on how to use the features of this textbook.

There are 12 chapters in this text. Each chapter is divided into sections and each section is subdivided into learning objectives. Each learning objective is labeled with a letter from A–E.

First, read each objective statement carefully so you will understand the learning goal that is being presented. Next, read the objective material carefully, being sure to note each bold word. These words indicate important concepts that you should familiarize yourself with. Study each in-text example carefully, noting the techniques and strategies used to solve the example.

You will then come to the key learning feature of this text, the *boxed examples*. These examples have been designed to aid you in a very specific way. Notice that in each example box, the example on the left is completely worked out and the example on the right is not. The reason for this is that *you* are expected to work the right-hand example (in the space provided) in order to immediately test your understanding of the material you have just studied.

You should study the worked-out example carefully by working through each step presented. This allows you to focus on each step and reinforces the technique for solving that type of problem. You can then use the worked-out example as a model for solving similar problems.

Then you should solve the right-hand example using the problem solving techniques that you have just studied. When you have completed your solution, check your work by turning to the page in the appendix where the complete solution can be found. The page number on which the solution appears is printed at the bottom of the example box in the right-hand corner. By checking your solution, you will know immediately whether or not you fully understand the skill just studied.

When you have completed studying an objective, do all of the exercises in the exercise set that correspond with that objective. The exercises will be labeled with the same letter as the objective. Algebra is a subject that needs to be learned in small sections and practiced continually in order to be mastered. Doing all of the exercises in each exercise set will help you master the problem solving techniques necessary for success.

Once you have completed the exercises to an objective, you should check your answers to the odd-numbered exercises with those found in the back of the book.

After completing a chapter, read the Chapter Summary. This summary highlights the important topics covered in the chapter. Following the Chapter Summary are Chapter Review Exercises, a Chapter Test, and a Cumulative Review (beginning with Chapter 2). Doing the review exercises is an important way of testing your understanding of the chapter. The answer to each review exercise is in an appendix at the back of the book. Each answer is followed by a reference that tells which objective that exercise was taken from. For example, (4.2B) means Section 4.2, Objective B. After checking your answers, restudy any objective that you missed. It may be very helpful to retry some of the exercises for that objective to reinforce your problem solving techniques.

The Chapter Test should be used to prepare for an exam. We suggest that you try the Chapter Test a few days before your actual exam. Take the test in a quiet place and try to complete the test in the same amount of time you will be allowed for your exam. When taking the Chapter Test, practice the strategies of successful test takers: 1) scan the entire test to get a feel for the questions; 2) read the directions carefully; 3) work the problems that are easiest for you first; and perhaps most importantly, 4) try to stay calm.

When you have completed the Chapter Test, check your answers. If you missed a question, review the material in that objective and rework some of the exercises from that objective. This will strengthen your ability to perform the skills in that objective.

The Cumulative Review allows you to refresh the skills you have learned in previous chapters. This is very important in mathematics. By consistently reviewing previous materials, you will retain the previous skills as you build new ones.

Remember, to be successful, attend class regularly; read the textbook carefully; actively participate in class; work with your textbook using the boxed examples for immediate feedback and reinforcement of each skill; do all the homework assignments; review constantly; and work carefully.

Introductory Algebra

An Applied Approach

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