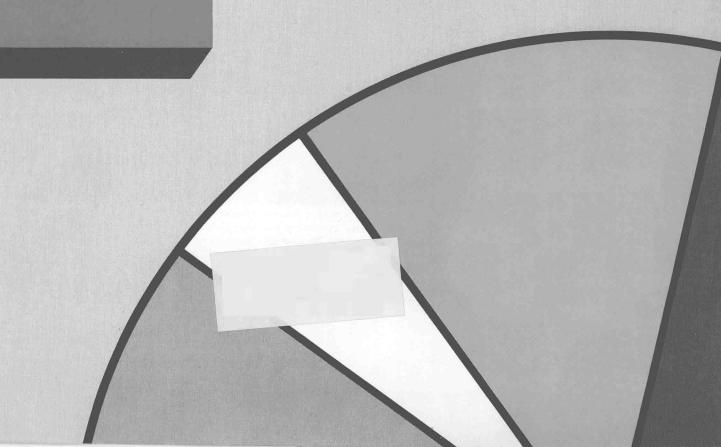
ESSENTIAL MATHEMATICS WITH APPLICATIONS

Lawrence A. Trivieri



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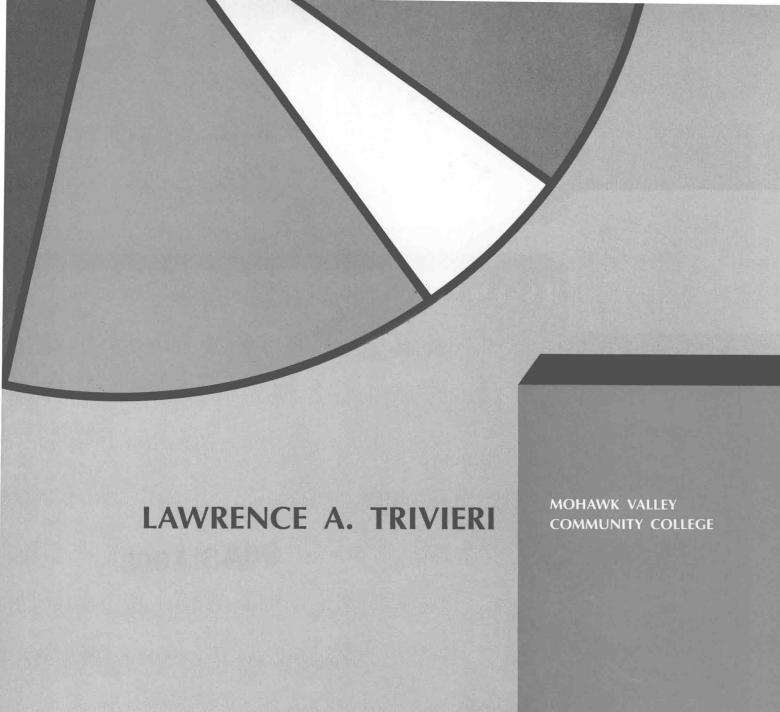
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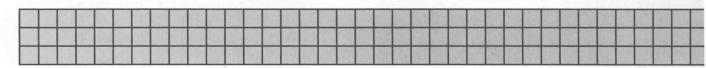
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ESSENTIAL MATHEMATICS WITH APPLICATIONS





PREFACE



This text is written to provide college students with the basic arithmetic and algebraic skills needed for daily life as well as for further coursework in mathematics. Elements of geometry are also covered in two chapters.

As the title indicates, applications or word problems, chosen from real-life situations, are found throughout the text. These are included so that the student will think about the arithmetic, algebraic, and geometric skills being developed and learn how to use them. They also provide the student with experience in the area of problem solving. It is the author's belief that these tasks should be undertaken by the college student in his or her very first course in mathematics.

The development of topics is nonrigorous, slow, and readable. The style of writing is conversational and should appeal to the student. There are numerous examples with solutions provided in the text. These are used to illustrate topics and procedures being introduced and to reinforce definitions and rules for various arithmetic and algebraic operations. On frequent occasions the text is interrupted with "practice exercises" together with answers. These practice exercises allow for immediate feedback for the student to assess basic understanding and comprehension of the material

being studied. There are numerous, well graded exercises for each section of the text.

Each chapter of the text begins with a pretest, with each test item referenced to the section of the chapter where the material is covered. Every section begins with statements of objectives for that section. At the end of each chapter is a summary that includes the key words found in the chapter and also a set of review exercises referenced to chapter sections. Starting with Chapter 2, each chapter has a set of cumulative review exercises. Answers for all odd-numbered exercises are included in the back of the text. Answers for the even-numbered exercises are included in a separate Instructor's Manual. Also included in the text are chapter tests. Additional forms of each chapter test, together with a sample final examination for arithmetic and algebra, are included in the Manual.

Since the needs of students at this level will vary, the text is written with flexibility in mind. For this reason a complete discussion of basic arithmetic is included, starting with the whole numbers and continuing through the integers. However these chapters can be tailored or omitted to fit specific needs. The various chapter tests and practice exercises make it possible for students to review

material quickly. Chapter 5, on measurement, may be delayed for as long as the instructor desires without loss of continuity. Chapters 6 through 12 are sequential and represent the core algebra chapters for a course at this level. On completion of Chapter 12, the instructor may choose materials from the remaining chapters as time and interests dictate. Suggested teaching guides, depending upon the preparation of students, are given immediately following the Preface.

On successful completion and understanding of the material in this text the student should be able to succeed in a course in intermediate algebra or a course designed especially for liberal arts students.

I would like to express my sincere appreciation to the many people who, through their encouragement, criticisms, and suggestions, have contributed to the successful development of this text. I am especially grateful to the following individuals for their thoughtful reviews and suggestions.

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SUGGESTED TEACHING GUIDE



BASIC COURSE: ALGEBRA WITH EXTENSIVE TREATMENT OF ARITHMETIC

Chapters 1–3, Sections 4.1–4.4, and Chapters 6–12 should be covered sequentially and completely.

The rest of Chapter 4 and all or parts of Chapter 5 may be covered, if necessary or desired.

Materials from Chapters 13–16 may also be selected depending on student preparation and instructor/class interests.

CORE COURSE: ALGEBRA WITH BRIEF REVIEW OF ARITHMETIC

Chapters 1–5 may be omitted.

Chapter 6 should be covered as quickly as the class preparation permits.

Chapters 7–12 should be covered sequentially and completely.

Materials from Chapters 13–16 may be selected depending on student preparation and instructor/class interests.

EITHER COURSE WITH A GEOMETRY COMPONENT

If geometry is to be included in the course, then either course outlined above should include Chapter 5 (which may be covered any time after Chapter 3) and all or parts of Chapter 17 (which may be covered any time after Chapter 8).

TO THE STUDENT

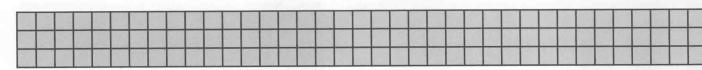


In order to meet with success, it is essential that you have a positive attitude and a willingness to learn mathematics. There are no spectators when it comes to learning mathematics. You learn mathematics by doing mathematics. That means *thinking* about what you are doing and then pushing the pencil across the paper in an attempt to do the exercises. It is necessary that you seek help as difficulties arise. This help can be sought from classmates, the course instructor, or the staff in the

mathematics laboratory, if one exists at your school. You must do the assigned work, including homework, on a regular basis. Otherwise, you will fall behind, become discouraged, and eventually meet with failure. There are no guaranteed routes to success in mathematics. However, a positive attitude, a willingness to learn, determination, patience, good study habits, and seeking additional help as needed, should help you to meet with success. Best wishes!

ESSENTIAL MATHEMATICS WITH APPLICATIONS

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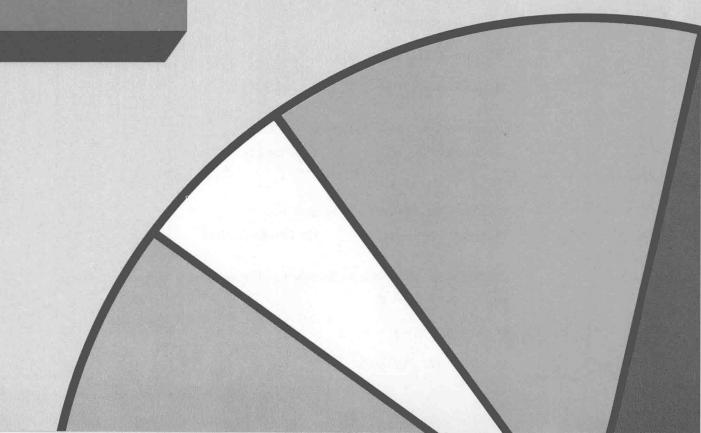
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THE WHOLE NUMBERS

The first type of number that you ever learned about as a child answered questions involving "How many?" such as: "How many days are in a week?" "How many fish did you catch?" "How many questions did you answer correctly?" Answers to these questions are given by numbers called whole numbers.

In this chapter, we will review the whole numbers, together with the operations of addition, subtraction, multiplication, and division of them. Properties associated with these operations, as well as properties of the whole number 0, will also be reviewed. Ordering of the whole numbers will be examined. Throughout the chapter, applications involving whole numbers will be introduced.



1

PRETEST

This pretest covers material on whole numbers. Read each question carefully and try to answer all questions. Each question is keyed to the chapter section in which the particular topic is discussed. Check your answers with those given in the back of the text. **ANSWERS** Questions 1–3 pertain to Section 1.1. 1. Indicate the place value of the colored digit in 245,132. 2. Write the word name for 8,062,790. 3. Write the numeral for: Fifteen million, six hundred seven thousand, eight hundred ninety-one. Questions 4-8 pertain to Section 1.2. 4. Circle the larger whole number: 217 or 301 5. Circle the smaller whole number: 196 or 187 6. Add: 23 + 57 + 9 7. Add: 36 + 109 + 1024 8. Add: 507 82 +699Questions 9–11 pertain to Section 1.3. 9. Subtract 302 - 87 10. From 1608, subtract 1035. 11. How much larger is 12,035 than 9807? Questions 12-13 pertain to Section 1.4. 12. Multiply: 86 and 57. 13. Multiply:

 \times 47

15. Divide: 54)2462

Questions 16-18 pertain to Section 1.6. Perform the indicated operations.

16.
$$5 \times 4 - 8 \div 2 + 7$$

14. Divide: 576 ÷ 24

17.
$$56 \div (2 \times 4 - 1) - 4 \div 2$$

Questions 14–15 pertain to Section 1.5.

18.
$$(288 \div 12) - (49 \div 7)$$