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Barry Schoenborn
Math and Technical Writing Specialist

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by Barry Schoenborn

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About the Author

Barry Schoenborn lives in Nevada City, California. He's a longtime math, science, and technical writer, with over 35 years' experience. He's written hundreds of user manuals. In the past, Barry's technical writing company worked with the State of California agency CalRecycle to teach scientists and administrators how to write clearly.

Barry's the coauthor of *Technical Math For Dummies, Medical Dosage Calculations For Dummies, Physician Assistant Exam For Dummies,* and *Storage Area Networks: Designing and Implementing a Mass Storage System.*

He was a movie reviewer for the Los Angeles *Herald-Dispatch* newspaper and wrote a monthly political newspaper column for *The Union* newspaper of Grass Valley, California, for seven years. He also writes "dental humor," a funny genre that nobody except a dentist would want to read.

Barry's publishing company, Willow Valley Press, published *Dandelion Through the Crack,* which won the William Saroyan International Prize for Writing.

Dedication

I dedicate this book to Lynda Straus, my long-time intimate friend. She is one of the brightest people I know and is an excellent technical writer. However, she stays very busy, mostly acting as caregiver for her mother and has never made math a focus. Oops! In many ways, she is my model for the ideal reader of this book.

Author's Acknowledgments

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Contents at a Glance

Table of Contents

Introduction

Math is great. I've spent my life enjoying math and getting the benefits from it. But many people don't think math is so hot: They have fear and loathing.

The trouble is, a lot of what you learned in school probably was boring or painful, and most likely you forgot it right away. Or you may have deliberately *not* learned some types of math at all just to save yourself the trouble of forgetting them later. Why? Mainly because a lot of the math taught in schools wasn't math you could use. Well, that nonsense stops here, because this book is filled with math you *can* use. Here's just a brief sampling of the areas where you'll find real-life math to be useful:

- At home, math comes in handy in the house, yard, workshop, and hobby room. It's also a big part of cooking in the kitchen, whether you're following a recipe or counting sticks of celery.
- The grocery store and shopping center are the places where most people buy the most items with the most frequency. You can use math when you're shopping to make better choices and get better deals.
- Real-life math helps with understanding food labels, losing weight, and exercising. You can get healthy by chance, but choice is better, and math helps you make choices.
- On the job, you'll find that a brush-up on math skills is very handy, whether you're filling out a timesheet, managing time on a project, making change, or doing any other math-related tasks.

About This Book

Math for real life is math you need, because math for real life is math you *use*. And that's what I focus on in this book, which is different from other math books. Here's a quick rundown of the major differences:

- This book is all about *practical* math. Although I cover math fundamentals (which are the building blocks of math for real life), I quickly move to problems you might deal with every day and the specific math skills you need to handle them. Other math books are often filled with abstractions.

- The book doesn't include any high-level equations, because you don't need them to go shopping or to calculate your auto repair bill. Even the world of gambling operates on simple formulas.
- It takes a *comprehensive* look at applying math in real-life areas. I include a little bit about a lot of subjects, and no subject goes any deeper than you need it to go. Many books are devoted to one subject (for example, algebra, geometry, trigonometry, or pre-calculus). Not this one — it's devoted to everything.
- It's *not dull* (I hope), as other math books often are. Because it's a *For Dummies* book, you can be sure that it's easy to read and has touches of humor.

But wait! There's more! At the risk of sounding like a late-night infomercial, you'll find other unique features that I gar-on-tee you won't find in a more traditional math book:

- You get terms, definitions, and word origins. The reason is that topics such as investments and insurance use so many odd words — and they need to be defined and explained.
- You get special insights into our culture and the way we think. For example, a "sale" isn't always a sale, and "free" doesn't always mean free. Even so, we tend to buy. Math for real life shows you where the exaggerations are.

Conventions Used in This Book

This book is user-friendly: easy to hold in your hands, easy to read, and easy to understand. On top of that, it's easy to navigate, too, because the table of contents, the index, and the "In This Chapter" section at the beginning of each chapter help you find information you're looking for.

The book uses the following conventions:

- *Italic type* highlights new terms. Once in a great while, you'll see italics used for emphasis.
- Although English teachers would cringe at my breaking the rules, I usually write numbers as numerals, not words. For example, the text will say "if you drive 30 miles on 2 gallons of gas," not "if you drive thirty miles on two gallons of gas."
- *Variables* in formulas appear as italics (for example, $3a + 4b = 10$).

- Web addresses are in `monofont`. They are usually very short and shouldn't break across two lines of text. But if they do, no extra characters indicate the break. Just type what you see into your browser.

What You're Not to Read

It would be great if you read all the words of this book in the order they appear, but life is short. You don't have to read chapters that don't interest you. This is a reference book, and it's designed to let you read only the parts you need. And if you get stuck, then you can go over to a chapter you skipped to get some help.

Here's a short list of "skippable" information. Information in these bits isn't essential to doing real-life math:

- You don't have to read anything with a Technical Stuff icon next to it. That text gives you a little extra information about a technique, the origin of a principle, or maybe a formal definition.
- Sidebars (that's what they're called in publishing) are blocks of text with a gray background. They are interesting (I think), but aren't critical to your understanding the main text.

Foolish Assumptions

The book makes some assumptions about you and what you're looking for in a math book:

- **You were exposed to math fundamentals in *elementary school* but may have forgotten a few of them.** (Why not high school? Because in high school many people get bored, dazed, or frustrated with mathematics. So although you may have been in class, your mind was probably somewhere else.) Even if you missed some basic math concepts in school, don't fret: I review most of them in this book.
- **You're only interested in information that's relevant to you and are likely to skip concepts you're already comfortable with.** That's okay. This is a reference book, not a novel.
- **You have access to a computer and the Internet.** Although not essential, being able to access the Internet is very handy. You can use a search engine to find useful specialized calculators or to learn more about any topic in this book.

How This Book Is Organized

This book has four parts, each representing a particular math topic. The chapters in the parts focus on different aspects of that topic. Overall, the book moves from an early review of basics to chapters about math that comes up in everyday life to topics related to personal finance. Of course, you don't have to read the chapters in the order they appear. Following is an overview of the kind of information you can find in each part.

Part I: Boning Up on Math Basics

In this part, you get math basics, which amount mostly to counting and simple arithmetic. Chapters 1, 2, and 3 bring out broad concepts related to the arithmetic fundamentals. In Chapter 4, you work with simple and useful statistics. Chapter 5 is about mental math, a great shortcut when you don't have a calculator handy (which is most of the time).

Part II: Math for Everyday Activities

Part II shows you how to do the calculations that spring up regularly in real life. Want to seed your lawn or plant a flower bed? Math is involved. How about preparing a dinner for six from a recipe designed to feed four? You need math for that, too. Ever tried to decide whether the higher-priced but bigger box of cereal is a better deal than the lower-priced but smaller box? Again, math comes to the rescue. Shopping, cooking, driving around town, dining out, or trying to lose weight — math makes all these tasks easier.

Part III: Math to Manage Your Personal Finances

True, you may deal with personal finances daily, but they represent a sort of "special" kind of math. To handle these tasks well, you need to understand some general principles, a few specialized terms, and a few strategies. Fortunately, this part has you covered. Here you can get info to create a budget, better manage your bank account and check register, avoid credit card debt, invest more wisely, and more.

Part IV: The Part of Tens

What better way to end a book chock-full of easy-to-apply math formulas and principles than a couple of lists highlighting calculations you can do in your head and games you can play to build your math skills and sharpen your critical thinking? Consider this the icing-on-top-of-the-cake part.

Icons Used in This Book

In the margins of this book you'll see small drawings called *icons*. Each icon calls out a special kind of information.

A tip is a suggestion or a recommendation. It usually points out a quick and easy way to get things done or provides a handy piece of extra information.

A warning alerts you to conditions that, if you're not careful, could lead you to wrong answers, faulty conclusions, or otherwise mess up your day.

This icon appears beside information that's important enough to keep in mind, both for the task at hand and in general.

I use this icon to share esoteric or otherwise interesting but non-essential information.

Where to Go from Here

You can go to any chapter of the book from here. Although I've written this book so that the basic info comes first, you can start anywhere you want. Need a little more guidance? Here are some suggestions:

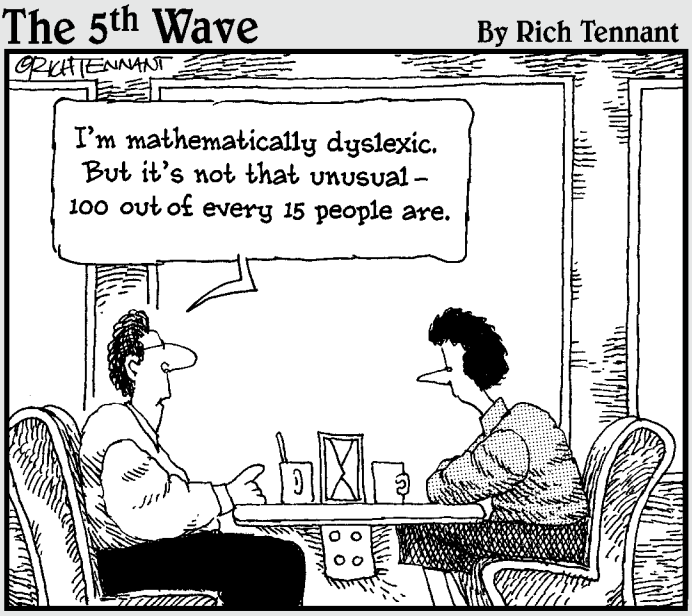
- If you're browsing for a topic that piques your interest, check out the table of contents. Here you can see all the topics this book covers. Chances are one (or more) will call to you immediately. You can also try the "thumb test": Riffle through the pages until something catches your eye.
- If you haven't made a choice, begin with Chapter 1. It has broad concepts and is a good launching pad into the discussions elsewhere in the book.

- If you have a particular problem (for example, maybe with shopping or investments), head to the table of contents or the index to find what you're looking for.

If you get stuck at any time, you'll probably find another chapter that can help you out. Just stop what you're reading and go visit that chapter.

Part I

Boning Up on Math Basics



In this part . . .

In this part, you'll find a review of math basics, including simple math concepts from your school days, like numbers, counting, and arithmetic operations. You also discover math principles like ratio-proportion, conversions, and statistics and probability. I also share the best all-purpose calculation method. Chapter 5, which is all about doing simple math in your head, is a math bonus. Mental math is a handy tool, and the techniques aren't hard to learn.

Chapter 1

Awesome Operations: Math Fundamentals

In This Chapter

- Reviewing the four arithmetic operations
- Manipulating fractions
- Using charts to convey and understand information
- Strategies to help you solve word problems

Math has basic operations that you need to know. These operations — addition, subtraction, multiplication, and division — make all the other math in this book possible.

The good news is that you most likely learned about basics (like counting) even before you entered school, and you learned about basic arithmetic operations in elementary school. So you've been at it for a long time.

In this chapter, I review counting and the fundamentals of the four basic arithmetic operations. Other important topics I cover here are fractions, percentages, charts and graphs, and word problems. But don't worry: None of these are mysterious.

Numbers You Can Count On

The most fundamental component of math is numbers. The first thing you do with numbers is count, and you probably started counting when you were very young. As soon as you could talk, your mother cajoled you to tell Aunt Lucy how old you were or to count from 1 to 5.

Counting was the first and most useful thing you did with math, and you still use it every day, whether you're buying oranges at the grocery store or checking the number of quarts of motor oil in a case.

Counting has been essential since people first walked the earth. In fact, the Ishango bone is a tally stick (a counting stick), and it's over 20,000 years old!

Several kinds of numbers exist. Over time, mathematicians have given them many names. The two most important kinds are whole numbers and fractions. To see a little bit about how these numbers work, use a *number line*, a simple display of numbers on a line (see Figure 1-1).

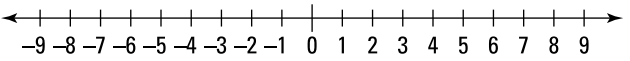


Illustration by Wiley, Composition Services Graphics

Figure 1-1: A number line.

The numbers to the right of 0 are called *natural* numbers or *counting* numbers. Of course, they are the numbers you use to count. They're easy for anyone to work with because they represent how many of something someone has (for example, 6 apples or 3 oranges).

Over many centuries and in different cultures, people made up the number 0, which represents the lack of a quantity. The numbers to the left of 0 on the number line, *negative* numbers, are a harder concept to grasp. You recognize negative number in real life. For example, if your checking account is overdrawn, you have a negative balance. If someone owes you $3.00, you have "negative cash" in your pocket.

Here are the key points to know about the number line:

- All the numbers you see in Figure 1-1 are *whole* numbers, also called *integers*. An *integer* is a number with no fraction part. The word comes from Latin, and it means "untouched," so it's the whole deal.
- The numbers to the right of zero are *positive integers*. The numbers to the left of zero are *negative integers*.

  Mathematicians (and I'm not making this up) have trouble with zero. The best they can do is attach it to the positive integers and label the group *non-negative integers*.
- The number line stretches to the left and right, to infinity and beyond (as Buzz Lightyear says).
- Decimals (such as 0.75) and regular fractions (such as 3/5) are only a part of a whole number. They all have a place somewhere on the number line. They fit in between the integers. For example 2.75 "fits" between 2 and 3 on the number line, because it's greater than 2 but less than 3.