




Making Everything Easier!™

2nd Edition

Algebra I Workbook

**FOR
DUMMIES®**

-  *Practice on hundreds of Algebra I problems*
-  *Review key concepts and formulas*
-  *Get complete answer explanations for all problems*



Mary Jane Sterling
Author of Algebra I For Dummies

Get More and Do More at Dummies.com®



Start with **FREE** Cheat Sheets

Cheat Sheets include

- Checklists
- Charts
- Common Instructions
- And Other Good Stuff!

To access the Cheat Sheet created specifically for this book, go to
www.dummies.com/cheatsheet/algebra1wb

Get Smart at Dummies.com

Dummies.com makes your life easier with 1,000s of answers on everything from removing wallpaper to using the latest version of Windows.

Check out our

- Videos
- Illustrated Articles
- Step-by-Step Instructions

Plus, each month you can win valuable prizes by entering our Dummies.com sweepstakes.*

Want a weekly dose of Dummies? Sign up for Newsletters on

- Digital Photography
- Microsoft Windows & Office
- Personal Finance & Investing
- Health & Wellness
- Computing, iPods & Cell Phones
- eBay
- Internet
- Food, Home & Garden

Find out **“HOW”** at Dummies.com



*Sweepstakes not currently available in all countries; visit Dummies.com for official rules.

Algebra I Workbook

FOR
DUMMIES[®]
2ND EDITION

by Mary Jane Sterling



WILEY

Wiley Publishing, Inc.

Algebra I Workbook For Dummies® 2nd Edition

Published by
Wiley Publishing, Inc.
111 River St.
Hoboken, NJ 07030-5774
www.wiley.com

Copyright © 2011 by Wiley Publishing, Inc., Indianapolis, Indiana

Published by Wiley Publishing, Inc., Indianapolis, Indiana

Published simultaneously in Canada

No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, scanning or otherwise, except as permitted under Sections 107 or 108 of the 1976 United States Copyright Act, without either the prior written permission of the Publisher, or authorization through payment of the appropriate per-copy fee to the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923, (978) 750-8400, fax (978) 646-8600. Requests to the Publisher for permission should be addressed to the Permissions Department, John Wiley & Sons, Inc., 111 River Street, Hoboken, NJ 07030, (201) 748-6011, fax (201) 748-6008, or online at <http://www.wiley.com/go/permissions>.

Trademarks: Wiley, the Wiley Publishing logo, For Dummies, the Dummies Man logo, A Reference for the Rest of Us!, The Dummies Way, Dummies Daily, The Fun and Easy Way, Dummies.com, Making Everything Easier, and related trade dress are trademarks or registered trademarks of John Wiley & Sons, Inc. and/or its affiliates in the United States and other countries, and may not be used without written permission. All other trademarks are the property of their respective owners. Wiley Publishing, Inc., is not associated with any product or vendor mentioned in this book.

LIMIT OF LIABILITY/DISCLAIMER OF WARRANTY: THE PUBLISHER AND THE AUTHOR MAKE NO REPRESENTATIONS OR WARRANTIES WITH RESPECT TO THE ACCURACY OR COMPLETENESS OF THE CONTENTS OF THIS WORK AND SPECIFICALLY DISCLAIM ALL WARRANTIES, INCLUDING WITHOUT LIMITATION WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE. NO WARRANTY MAY BE CREATED OR EXTENDED BY SALES OR PROMOTIONAL MATERIALS. THE ADVICE AND STRATEGIES CONTAINED HEREIN MAY NOT BE SUITABLE FOR EVERY SITUATION. THIS WORK IS SOLD WITH THE UNDERSTANDING THAT THE PUBLISHER IS NOT ENGAGED IN RENDERING LEGAL, ACCOUNTING, OR OTHER PROFESSIONAL SERVICES. IF PROFESSIONAL ASSISTANCE IS REQUIRED, THE SERVICES OF A COMPETENT PROFESSIONAL PERSON SHOULD BE SOUGHT. NEITHER THE PUBLISHER NOR THE AUTHOR SHALL BE LIABLE FOR DAMAGES ARISING HEREFROM. THE FACT THAT AN ORGANIZATION OR WEBSITE IS REFERRED TO IN THIS WORK AS A CITATION AND/OR A POTENTIAL SOURCE OF FURTHER INFORMATION DOES NOT MEAN THAT THE AUTHOR OR THE PUBLISHER ENDORSES THE INFORMATION THE ORGANIZATION OR WEBSITE MAY PROVIDE OR RECOMMENDATIONS IT MAY MAKE. FURTHER, READERS SHOULD BE AWARE THAT INTERNET WEBSITES LISTED IN THIS WORK MAY HAVE CHANGED OR DISAPPEARED BETWEEN WHEN THIS WORK WAS WRITTEN AND WHEN IT IS READ.

For general information on our other products and services, please contact our Customer Care Department within the U.S. at 877-762-2974, outside the U.S. at 317-572-3993, or fax 317-572-4002.

For technical support, please visit www.wiley.com/techsupport.

Wiley also publishes its books in a variety of electronic formats and by print-on-demand. Some content that appears in standard print versions of this book may not be available in other formats. For more information about Wiley products, visit us at www.wiley.com.

Library of Congress Control Number: 2011930305

ISBN 978-1-118-04922-8 (cloth); ISBN 978-1-118-10204-6 (ebk); ISBN 978-1-118-10205-3 (ebk); ISBN 978-1-118-10206-0 (ebk)

Manufactured in the United States of America

10 9 8 7 6 5 4 3 2 1



About the Author

Mary Jane Sterling is the author of *Algebra I For Dummies*, 2nd Edition, *Trigonometry For Dummies*, *Algebra II For Dummies*, *Math Word Problems For Dummies*, *Business Math For Dummies*, and *Linear Algebra For Dummies*. She taught junior high and high school math for many years before beginning her current 30-years-and-counting tenure at Bradley University in Peoria, Illinois. Mary Jane especially enjoys working with future teachers and trying out new technology.

Dedication

This book is dedicated to my parents. My father, Tom Mackie, always encouraged me to pursue my interests in mathematics and science — at a time when girls were encouraged to study home economics. My mother, Jane Mackie, was a woman before her time — stepping out into the world when it wasn't all that fashionable for women to do so. And at 84-years old, she proudly announced that she had read *Algebra For Dummies* from beginning to end and understood it!

Author's Acknowledgments

I'd like to thank Tracy Barr for being a great editor — taking care of all those nitty-gritty details, as well as the big issues. A big thanks also goes to the technical editors, Mike McAsey and Shira Fass, who didn't let me get away with any slips or missteps. Also, thanks to Lindsay LeFevere for providing another project — lest I sit around, twiddling my thumbs.

Publisher's Acknowledgments

We're proud of this book; please send us your comments at <http://dummies.custhelp.com>. For other comments, please contact our Customer Care Department within the U.S. at 877-762-2974, outside the U.S. at 317-572-3993, or fax 317-572-4002.

Some of the people who helped bring this book to market include the following:

Acquisitions, Editorial, and Media Development

Editor: Tracy Barr

(Previous Edition: Alissa Schwipps)

Executive Editor: Lindsay Sandman Lafevere

Assistant Editor: David Lutton

Editorial Program Coordinator: Joe Niesen

Technical Editors: Michael McAsey, Shira Fass

Senior Editorial Manager: Jennifer Ehrlich

Editorial Supervisor and Reprint Editor:
Carmen Krikorian

Editorial Assistant: Rachele S. Amick

Cover Photos: © iStockphoto.com / porcorex

Cartoons: Rich Tennant (www.the5thwave.com)

Composition Services

Project Coordinator: Patrick Redmond

Layout and Graphics: Carrie A. Cesavice,
Nikki Gately, Mark Pinto, Christin Swinford

Proofreaders: Melissa D. Buddendeck,
Lauren Mandelbaum

Indexer: Potomac Indexing, LLC

Publishing and Editorial for Consumer Dummies

Diane Graves Steele, Vice President and Publisher, Consumer Dummies

Kristin Ferguson-Wagstaffe, Product Development Director, Consumer Dummies

Ensley Eikenburg, Associate Publisher, Travel

Kelly Regan, Editorial Director, Travel

Publishing for Technology Dummies

Andy Cummings, Vice President and Publisher, Dummies Technology/General User

Composition Services

Debbie Stailey, Director of Composition Services

Contents at a Glance

<i>Introduction</i>	1
<i>Part I: Getting Down to the Nitty-Gritty on Basic Operations</i>	7
Chapter 1: Deciphering Signs in Numbers	9
Chapter 2: Incorporating Algebraic Properties	19
Chapter 3: Making Fractions and Decimals Behave	27
Chapter 4: Exploring Exponents	47
Chapter 5: Taming Rampaging Radicals	57
Chapter 6: Simplifying Algebraic Expressions	69
<i>Part II: Changing the Format of Expressions</i>	79
Chapter 7: Specializing in Multiplication Matters	81
Chapter 8: Dividing the Long Way to Simplify Algebraic Expressions	93
Chapter 9: Figuring on Factoring	105
Chapter 10: Taking the Bite Out of Binomial Factoring	113
Chapter 11: Factoring Trinomials and Special Polynomials	119
<i>Part III: Seek and Ye Shall Find. . . Solutions</i>	135
Chapter 12: Lining Up Linear Equations	137
Chapter 13: Muscling Up to Quadratic Equations	155
Chapter 14: Yielding to Higher Powers	169
Chapter 15: Reeling in Radical and Absolute Value Equations	181
Chapter 16: Getting Even with Inequalities	191
<i>Part IV: Solving Story Problems and Sketching Graphs</i>	205
Chapter 17: Facing Up to Formulas	207
Chapter 18: Making Formulas Work in Basic Story Problems	221
Chapter 19: Relating Values in Story Problems	235
Chapter 20: Measuring Up with Quality and Quantity Story Problems	245
Chapter 21: Getting a Handle on Graphing	257
<i>Part V: The Part of Tens</i>	285
Chapter 22: Ten Common Errors That Get Noticed	287
Chapter 23: Ten Quick Tips to Make Algebra a Breeze	291
<i>Index</i>	295

Table of Contents

Introduction 1

About This Book	1
Conventions Used in This Book.....	2
Foolish Assumptions.....	2
How This Book Is Organized	3
Part I: Getting Down to the Nitty-Gritty on Basic Operations	3
Part II: Changing the Format of Expressions	3
Part III: Seek and Ye Shall Find. . .Solutions.....	4
Part IV: Solving Story Problems and Sketching Graphs.....	4
Part V: The Part of Tens	4
Icons Used in This Book	4
Where to Go from Here.....	5

Part 1: Getting Down to the Nitty-Gritty on Basic Operations..... 7

Chapter 1: Deciphering Signs in Numbers 9

Assigning Numbers Their Place.....	9
Reading and Writing Absolute Value	10
Adding Signed Numbers	11
Making a Difference with Signed Numbers.....	12
Multiplying Signed Numbers	13
Dividing Signed Numbers	14
Answers to Problems on Signed Numbers	16

Chapter 2: Incorporating Algebraic Properties 19

Getting a Grip on Grouping Symbols	19
Distributing the Wealth.....	21
Making Associations Work	22
Computing by Commuting.....	23
Answers to Problems on Algebraic Properties.....	25

Chapter 3: Making Fractions and Decimals Behave 27

Converting Improper and Mixed Fractions	27
Finding Fraction Equivalences.....	29
Making Proportional Statements	30
Finding Common Denominators	32
Adding and Subtracting Fractions.....	33
Multiplying and Dividing Fractions	34
Simplifying Complex Fractions	37
Changing Fractions to Decimals and Vice Versa.....	38
Performing Operations with Decimals.....	40
Answers to Problems on Fractions	41

Chapter 4: Exploring Exponents	47
Multiplying and Dividing Exponentials	47
Raising Powers to Powers	49
Using Negative Exponents	51
Writing Numbers with Scientific Notation.....	52
Answers to Problems on Discovering Exponents	54
Chapter 5: Taming Rampaging Radicals	57
Simplifying Radical Expressions	57
Rationalizing Fractions	59
Arranging Radicals as Exponential Terms	60
Using Fractional Exponents.....	62
Simplifying Expressions with Exponents.....	63
Estimating Answers	65
Answers to Problems on Radicals	66
Chapter 6: Simplifying Algebraic Expressions	69
Adding and Subtracting Like Terms.....	69
Multiplying and Dividing Algebraically.....	71
Incorporating Order of Operations	72
Evaluating Expressions	73
Answers to Problems on Algebraic Expressions.....	76
 Part II: Changing the Format of Expressions	 79
Chapter 7: Specializing in Multiplication Matters	81
Distributing One Factor over Many.....	81
Curses, FOILed Again — Or Not.....	82
Squaring Binomials.....	84
Multiplying the Sum and Difference of the Same Two Terms.....	85
Cubing Binomials.....	86
Creating the Sum and Difference of Cubes.....	87
Raising Binomials to Higher Powers	88
Answers to Problems on Multiplying Expressions.....	90
Chapter 8: Dividing the Long Way to Simplify Algebraic Expressions	93
Dividing by a Monomial	93
Dividing by a Binomial	95
Dividing by Polynomials with More Terms	98
Simplifying Division Synthetically	99
Answers to Problems on Division	101
Chapter 9: Figuring on Factoring	105
Pouring Over Prime Factorizations	105
Factoring Out the Greatest Common Factor	107
Reducing Algebraic Fractions	108
Answers to Problems on Factoring Expressions	110

Chapter 10: Taking the Bite Out of Binomial Factoring	113
Factoring the Difference of Squares	113
Factoring Differences and Sums of Cubes	114
Making Factoring a Multiple Mission	115
Answers to Problems on Factoring	117
Chapter 11: Factoring Trinomials and Special Polynomials	119
Focusing First on the Greatest Common Factor (GCF)	119
“Un”wrapping the FOIL	121
Factoring Quadratic-Like Trinomials	123
Factoring Trinomials Using More Than One Method	124
Factoring by Grouping	126
Putting All the Factoring Together	128
Answers to Problems on Factoring Trinomials and Other Expressions	130
 <i>Part III: Seek and Ye Shall Find. . . Solutions</i>	 135
Chapter 12: Lining Up Linear Equations	137
Using the Addition/Subtraction Property	137
Using the Multiplication/Division Property	139
Putting Several Operations Together	140
Solving Linear Equations with Grouping Symbols	142
Working It Out with Fractions	144
Solving Proportions	146
Answers to Problems on Solving Linear Equations	148
Chapter 13: Muscling Up to Quadratic Equations	155
Using the Square Root Rule	155
Solving by Factoring	156
Using the Quadratic Formula	158
Completing the Square	161
Dealing with Impossible Answers	162
Answers to Problems on Solving Quadratic Equations	164
Chapter 14: Yielding to Higher Powers	169
Determining How Many Possible Roots	169
Applying the Rational Root Theorem	171
Using the Factor/Root Theorem	172
Solving By Factoring	174
Solving Powers That Are Quadratic-Like	176
Answers to Problems on Solving Higher Power Equations	178
Chapter 15: Reeling in Radical and Absolute Value Equations	181
Squaring Both Sides to Solve Radical Equations	181
Doubling the Fun with Radical Equations	184
Solving Absolute Value Equations	185
Answers to Problems on Radical and Absolute Value Equations	187



Chapter 16: Getting Even with Inequalities	191
Using the Rules to Work on Inequality Statements	191
Rewriting Inequalities by Using Interval Notation	192
Solving Linear Inequalities	193
Solving Quadratic Inequalities	195
Dealing with Polynomial and Rational Inequalities	196
Solving Absolute Value Inequalities	198
Solving Complex Inequalities	200
Answers to Problems on Working with Inequalities	201

Part IV: Solving Story Problems and Sketching Graphs **205**

Chapter 17: Facing Up to Formulas	207
Working with Formulas	207
Deciphering Perimeter, Area, and Volume	209
Using perimeter formulas to get around	209
Squaring off with area formulas	211
Working with volume formulas	213
Getting Interested in Using Percent	215
Answers to Problems on Using Formulas	217

Chapter 18: Making Formulas Work in Basic Story Problems	221
Applying the Pythagorean Theorem	221
Using Geometry to Solve Story Problems	223
Putting Distance, Rate, and Time in a Formula	226
Examining the distance-rate-time formula	226
Going the distance with story problems	228
Answers to Making Formulas Work in Basic Story Problems	230

Chapter 19: Relating Values in Story Problems	235
Tackling Age Problems	235
Tackling Consecutive Integer Problems	237
Working Together on Work Problems	240
Answers to Relating Values in Story Problems	242

Chapter 20: Measuring Up with Quality and Quantity Story Problems	245
Achieving the Right Blend with Mixtures Problems	245
Concocting the Correct Solution One Hundred Percent of the Time	248
Dealing with Money Problems	250
Answers to Problems on Measuring Up with Quality and Quantity	252

Chapter 21: Getting a Handle on Graphing	257
Thickening the Plot with Points.....	257
Sectioning Off by Quadrants	259
Using Points to Lay Out Lines	260
Graphing Lines with Intercepts	262
Computing Slopes of Lines	263
Graphing with the Slope-Intercept Form	265
Changing to the Slope-Intercept Form	267
Writing Equations of Lines	268
Picking on Parallel and Perpendicular Lines	269
Finding Distances between Points.....	270
Finding the Intersections of Lines	271
Graphing Parabolas and Circles	272
Graphing with Transformations	274
Answers to Problems on Graphing	277
 Part V: The Part of Tens	 285
Chapter 22: Ten Common Errors That Get Noticed	287
Squaring a Negative or Negative of a Square	287
Squaring a Binomial	287
Operating on Radicals.....	288
Distributing a Negative Throughout	288
Fracturing Fractions.....	288
Raising a Power to a Power	289
Making Negative Exponents Flip.....	289
Making Sense of Reversing the Sense	289
Using the Slope Formula Correctly	290
Writing Several Fractions as One	290
 Chapter 23: Ten Quick Tips to Make Algebra a Breeze	 291
Flipping Proportions	291
Multiplying Through to Get Rid of Fractions	291
Zeroing In on Fractions.....	292
Finding a Common Denominator	292
Dividing by 3 or 9.....	292
Dividing by 2, 4, or 8.....	293
Commuting Back and Forth.....	293
Factoring Quadratics.....	294
Making Radicals Less Rad, Baby.....	294
Applying Acronyms	294
 Index	 295

Introduction

Some of my earliest grade-school memories include receiving brand-new workbooks at the beginning of the school year. The pages of these workbooks were crisp, pristine, beautiful — and intimidating at the same time. But it didn't take long for those workbooks to become well used and worn. My goal with *Algebra I Workbook For Dummies*, 2nd Edition, is to give you that same workbook experience — without the intimidation, of course. This book is filled with algebra problems you can study, solve, and learn from. But you're not going to be doing these problems alone. As you proceed through *Algebra I Workbook For Dummies*, 2nd Edition, you'll see plenty of road signs that clearly mark the way. You'll find plenty of explanations, examples, and other bits of info to make this journey as smooth an experience as possible. You also get to do your own grading with the solutions I provide at the end of each chapter. You can even go back and change your answers to the correct ones, if you made an error. No, you're not cheating. You're figuring out how to correctly work algebra problems. (Actually, changing answers to the correct ones is a great way to learn from your mistakes.)

Remember, mathematics is a subject that has to be *handled*. You can read English literature and understand it without having to actually write it. You can read about biological phenomena and understand them, too, without taking part in an experiment. Mathematics is different. You really do have to do it, practice it, play with it, and use it. Only then does the mathematics become a part of your knowledge and skills. And what better way to get your fingers wet than by jumping into this workbook? Remember only practice, practice, and some more practice can help you master algebra! Have at it!

About This Book

I've organized *Algebra I Workbook For Dummies*, 2nd Edition, very much like the way I organized *Algebra I For Dummies* (Wiley), which you may already have: I introduce basic concepts and properties first and then move on to the more complex ones. That way, if you're pretty unsteady on your feet, algebra-wise, you can begin at the beginning and build your skills and your confidence as you progress through the different chapters.

But maybe you don't need practice problems from beginning to end. Maybe you just need a bit of extra practice with specific types of algebra problems. One nice thing about this workbook is that you can start wherever you want. If your nemesis is graphing, for example, you can go straight to the chapters that focus on graphing. Formulas your problem area? Then go to the chapters that deal with formulas.

Bottom line: You do need the basic algebra concepts to start anywhere in this workbook, but after you have those down, you can pick and choose where you want to work. You can jump in wherever you want and work from there.

Conventions Used in This Book

I use the following conventions in this book to make things consistent and easy to understand, regardless which practice problems you're tackling:

- ✔ New terms appear in *italic* and are closely followed by a clear definition.
- ✔ I **bold** the answers to the examples and the practice questions for easy identification. However, I don't bold the punctuation that follows the answer because I want to prevent any confusion with periods and decimal points that could be considered part of the answer.
- ✔ Algebra uses a lot of letters to represent numbers. In general, I use letters at the beginning of the alphabet (*a, b, c, k*) to represent *constants* — numbers that don't change all the time but may be special to a particular situation. The letters at the end of the alphabet usually represent *variables* — what you're solving for. I use the most commonly used letters (*x, y* and *z*) for variables. And all constants and variables are *italicized*. And if, for any reason, I don't follow this convention, I let you know so that you aren't left guessing. (You may see breaks from the convention in some old, traditional formulas, for example, or when you want a particular letter to stand for someone's age, which just may happen to start with the letter A.)
- ✔ I use the corresponding symbols to represent the math operations of addition, subtraction, multiplication, and division: $+$, $-$, \times , and \div . But keep the following special rules in mind when using them in algebra and in this book:
 - Subtraction ($-$) is an operation, but that symbol also represents *opposite of*, *minus*, and *negative*. When you get to the different situations, you can figure out how to interpret the wording, based on the context.
 - Multiplication (\times) is usually indicated with a dot (\cdot) or parentheses ($()$) in algebra. In this book, I use parentheses most often, but you may occasionally see a \times symbol. Don't confuse the \times symbol with the italicized variable, *x*.
 - Division (\div) is sometimes indicated with a slash ($/$) or fraction line. I use these interchangeably in the problems throughout this book.

Foolish Assumptions

When writing this book, I made the following assumptions about you, my dear reader:

- ✔ You already have reasonable experience with basic algebra concepts and want an opportunity to practice those skills.

Note: Workbooks in general — and this workbook in particular — are designed to provide additional practice opportunities for concepts and processes that have been introduced elsewhere. For that reason, I don't go into great depth when explaining the theories and rules behind each problem I've included in this book because I assume you have some other book, like my *Algebra I For Dummies* (Wiley), for more in-depth reference, if necessary.

- ✔ You took or currently are taking Algebra I, but you need to brush up on certain areas.
- ✔ Your son, daughter, grandson, granddaughter, niece, nephew, or special someone is taking Algebra I. You haven't looked at an equation for years, and you want to help him or her.
- ✔ You love math, and your idea of a good time is solving equations on a rainy afternoon while listening to your iPod.

How This Book Is Organized

Like all books in the *For Dummies* series, this book is divided into a variety of chapters, each tackling a particular topic. The chapters are then organized into parts. Each part covers a general area of study or type of concept. This organization allows you to pinpoint where you want to start or where you need to revisit. To help you access important concepts in algebra, I've divided the chapters in *Algebra I Workbook For Dummies*, 2nd Edition, into the following five parts.

Part I: Getting Down to the Nitty-Gritty on Basic Operations

This first part starts with essential algebra topics, but it doesn't start at the beginning of arithmetic or cover much pre-algebra. Here, you can find out how to work with signed numbers and their operations. You also see those ever-loving fractions and get to add or multiply them. This part also focuses on exponents, numbers, and variables and how they combine — or don't combine. I follow exponents with radicals — not the hippies from the 1960s, but those operations that can be represented with fractional exponents. And, lastly, the basics include combining terms that are alike enough to go together.

Part II: Changing the Format of Expressions

Algebra is a stepping-stone to higher mathematics. In fact, you really can't do much advanced mathematics without algebra. After you acquaint yourself with the symbols and operations of algebra, you can move on to other algebraic processes such as solving equations and graphing. This part describes and refines the basic operations and then coordinates the operations in terms of having unknown or variable terms and factors. The operations act the same as when you perform them on numbers; they just look different and have different types of results.

The factoring part is *big*. True, factoring is really just undoing something that got multiplied out. You can think of factoring as being the first step in solving an equation or a puzzle or challenge. Get good at factoring, and the answer comes much more easily.

Part III: Seek and Ye Shall Find. . . Solutions

Discovering a solution to an equation is usually everyone's favorite part of algebra. It provides a motivation for performing all those algebraic operations and processes. You finally have an answer! Sometimes you can just look at an equation, and the solution pops right out at you. For instance, doesn't the equation $x + 1 = 7$ just cry out that $x = 6$? Sometimes you just *think* you know what the solution is, but beware: There may be more to an equation than meets the eye. This part discusses the different types of equations and inequalities in terms of their similarities and how to handle those similarities and cope with their differences.

Part IV: Solving Story Problems and Sketching Graphs

After you master the techniques needed to solve the different types of equations, you can focus on writing the equations yourself and putting those skills to use. The applications of algebra come in the form of standard formulas for area, temperature, distance, and many more. The applications also take the form of word problems that need to be translated into equation form so you can solve them or even graph them.

Part V: The Part of Tens

Like every *For Dummies* book, The Part of Tens chapters offer you some quick tips. This part has two completely different lists. You can call them the "how to" and "how not to" lists.

The "how to" list includes tricks of the trade that I pull together from several areas. These tips can save you time and energy when dealing with different situations in algebra. The "how not to" list contains some of the more frequently occurring errors in algebra. Oh, yes, people have plenty of opportunities for errors when dealing with algebraic terms and processes, but some stand out above others. Maybe these common errors are centered deep within the human brain; they fool people again and again for some reason. In any case, look them over to avoid these pitfalls.

Icons Used in This Book

In this book, I include icons that help you find key ideas and information. Of course, because this entire workbook is chock-full of important nuggets of information, I highlight only the crème-de-la-crème information with these icons:



You find this icon throughout the book, highlighting the examples that cover the techniques needed to do the practice problems. Before you attempt the problems, look over an example or two, which can help you get started.



This icon highlights hints or suggestions that can save you time and energy, help you ease your way through the problems, and cut down on any potential frustration.



This icon highlights the important algebraic rules or processes that you want to remember, both for the algebra discussed in that particular location as well as for general reference later.



Although this icon isn't in red, it does call attention to particularly troublesome points. When I use this icon, I identify the tricky elements and tell you how to avoid trouble — or what to do to get out of it.

Where to Go from Here

Ready to start? All psyched and ready to go? Then it's time to take this excursion in algebra. Yes, this workbook is a grand adventure just waiting for you to take the first step. Before you begin your journey, however, I have a couple of recommendations:

- ✓ That you have a guidebook handy to help you with the trouble spots. One such guide is my book, *Algebra I For Dummies* (Wiley), which, as a companion to this book, mirrors most of the topics presented here. You can use it — or any well-written introductory algebra book — to fill in the gaps.
- ✓ That you pack a pencil with an eraser. It's the teacher and mathematician in me who realizes that mistakes can be made, and they erase easier when in pencil. That scratched-out blobby stuff is just not pretty.

When you're accoutered with the preceding items, you need to decide where to start. No, you don't have to follow any particular path. You can venture out on your own, making your own decisions, taking your time, moving from topic to topic. You can do what you want. Or you can always stay with the security of the grand plan and start with the first chapter and carefully proceed through to the end. It's your decision, and any choice is correct.

