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# Prealgebra

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Annotated Instructor's Edition

# Prealgebra

Eighth Edition

Elayn Martín-Gay

University of New Orleans



330 Hudson Street, NY NY 10013

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**Courseware Portfolio Manager:** *Mary Beckwith*  
**Courseware Portfolio Management Assistant:** *Alison Oehman*  
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**Senior Author Support/Technology Specialist:** *Joe Vetere*  
**Manager, Rights and Permissions:** *Gina Cheselka*  
**Manufacturing Buyer:** *Carol Melville, LSC Communications*  
**Text Design:** *Tamara Newnam*  
**Composition and Production Coordination:** *Integra*  
**Illustrations:** *Scientific Illustrators*  
**Senior Designer:** *Barbara T. Atkinson*  
**Cover Design:** *Tamara Newman*  
**Cover Image:** *Tamara Newman*

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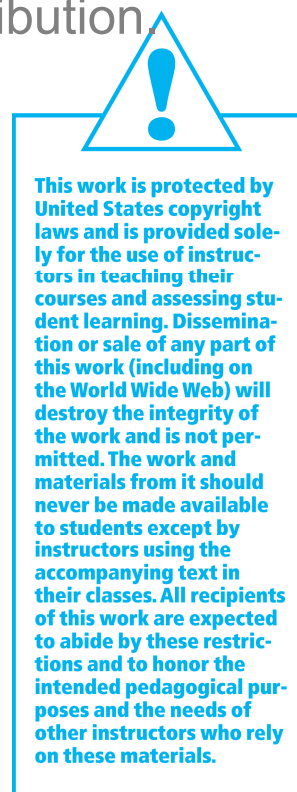
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#### Library of Congress Cataloging-in-Publication Data

Names: Martin-Gay, K. Elayn, author.  
 Title: Prealgebra / Elayn Martin-Gay.  
 Description: 8th edition. | New York : Pearson, [2019] | Includes index. | Revised edition published, 8th edition, Boston, 2015.  
 Identifiers: LCCN 2017034234 | ISBN 9780134707648 (se : alk. paper) | ISBN 9780134708829 (aie : alk. paper) | ISBN 9780134708706 (ebook)  
 Subjects: LCSH: Arithmetic--Textbooks.  
 Classification: LCC QA107.2 .M37 2019 | DDC 513/.1--dc23  
 LC record available at <https://lccn.loc.gov/2017034234>



# Sample preface. Not for Distribution.

This book is dedicated to students everywhere—  
and we should all be students. After all, is there anyone among  
us who truly knows too much? Take that hint and continue  
to learn something new every day of your life.

Best wishes from a fellow student:  
Elayn Martin-Gay

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# Preface

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*Prealgebra, Eighth Edition*, was written to help students make the transition from arithmetic to algebra. To help students accomplish this, my goals for this text are:

- Most importantly, to write an organized, student-friendly text that is keyed to objectives and contains many worked-out examples.
- To introduce algebraic concepts early and repeat them often as I cover traditional arithmetic topics, thus laying the groundwork for the next algebra course your students will take.
- To show students the relevancy of mathematics in everyday life and in the workplace by emphasizing and integrating the following throughout this text: real-life and real-data applications, data interpretation, conceptual understanding, problem solving, writing, cooperative learning, number sense, estimation, critical thinking and geometric concepts.

The many factors that contributed to the success of the previous editions have been retained. In preparing the Eighth Edition, I considered comments and suggestions of colleagues, students, and many users of the prior edition throughout the country.

## What's New in the Eighth Edition?

- **The Martin-Gay Program** has been revised and enhanced with a new design in the text and MyLab Math to actively encourage students to use the text, video program, and Video Organizer as an integrated learning system.
- **New Getting Ready for the Test** can be found before each Chapter Test. These exercises can increase student success by helping students prepare for their Chapter Test. The purpose of these exercises is to check students' conceptual understanding of the topics in the chapter as well as common student errors. It is suggested that students complete and check these exercises before taking a practice Chapter Test. All Getting Ready for the Test exercises are either Multiple Choice or Matching, and all answers can be found in the answer section of this text.

**Video Solutions** of all exercises can be found in MyLab Math. These video solutions contain brief explanations and reminders of material in the chapter. Where applicable, incorrect choices contain explanations.

Getting Ready for the Test exercise numbers marked in blue indicate that the question is available in **Learning Catalytics**. **LC**

- **New Learning Catalytics** is an interactive student response tool that uses students' smartphones, tablets, or laptops to engage them in more sophisticated tasks and thinking. Generate class discussion, guide your lecture, and promote peer-to-peer learning with real-time analytics. Accessible through MyLab Math, instructors can use Learning Catalytics to:
  - Pose a variety of open-ended questions that help your students develop critical thinking skills.
  - Monitor responses to find out where students are struggling.
  - Use real-time data to adjust your instructional strategy and try other ways of engaging your students during class.
  - Manage student interactions by automatically grouping students for discussion, teamwork, and peer-to-peer learning.

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- Pearson-created questions on developmental math topics are available to allow you to take advantage of this exciting technology. Additionally, “Getting Ready for the Test” exercises (marked in blue) are available in Learning Catalytics. Search the question library for “MGPre” and the chapter number, for example, MGPre7 would be the questions from Chapter 7.
- **Revised and updated Key Concept Activity Lab Workbook** includes Extension Exercises, Exploration Activities, Conceptual Exercises, and Group Activities. These activities are a great way to engage students in conceptual projects and exploration as well as group work. This workbook is available in MyLab Math, or can be packaged with a text or MyLab code.
- **Exercise Sets** have been carefully examined and revised. Special focus was placed on making sure that even- and odd-numbered exercises are carefully paired and that real-life applications are updated.
- **The Martin-Gay MyLab Math** course has been updated and revised to provide more exercise coverage, including assignable Video Check questions and an expanded video program. There are Lecture Videos for every section, which students can also access at the specific objective level; Student Success Tips videos; and an increased number of video clips at the exercise level to help students while doing homework in MyLab Math. Suggested homework assignments have been premade for assignment at the instructor’s discretion.

## Key Continuing Resources and Pedagogical Features

- **Vocabulary, Readiness & Video Check Questions** continue to be available in the text and for assignment in MyLab Math. The **Readiness** exercises center on a student’s understanding of a concept that is necessary in order to continue to the exercise set. The **Video Check questions** are included in every section for every learning objective. These exercises are a great way to assess whether students have viewed and understood the key concepts presented in the videos. Answers to all Video Check questions are available in an answer section at the back of the text.
- **Interactive Lecture Series in MyLab Math**, featuring author Elayn Martin-Gay, provides students with active learning at their own pace. The videos offer the following resources and more:
  - **A complete lecture for each section of the text** highlights key examples and exercises from the text. Pop-ups reinforce key terms, definitions, and concepts.
  - **An interface with menu navigation features** allows students to quickly find and focus on the examples and exercises they need to review.
  - **Interactive Concept Check** exercises measure students’ understanding of key concepts and common trouble spots.
  - **Student Success Tips Videos** are 3-5 minute videos designed to be daily reminders to students to continue practicing and maintaining good organizational and study habits. They include student success tips for general college success, tips specific to success in math courses, and content-specific tips to avoid common mathematical mistakes.
- **The Interactive Lecture Series** also includes the following resources for test prep:
  - **New Getting Ready for the Chapter Test Videos**
  - **The Chapter Test Prep Videos** help students during their most teachable moment—when they are preparing for a test. This innovation provides step-by-step solutions for the exercises found in each Chapter Test. For the Eighth Edition, the chapter test prep videos are also available on YouTube™. The videos are captioned in English and Spanish.
  - **The Practice Final Exam Videos** help students prepare for an end-of-course final. Students can watch full video solutions to each exercise in the Practice Final Exam at the end of this text.

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- **The Video Organizer** helps students take notes and work practice exercises while watching the Interactive Lecture Series videos in their MyLab Math course. All content in the Video Organizer is presented in the same order as it is presented in the videos, making it easy for students to create a course notebook and build good study habits.
    - Covers all of the video examples in order.
    - Provides prompts with ample space for students to write down key definitions and properties.
    - Includes Play and Pause button icons to prompt students to follow along with the author for some exercises while they try others on their own.


The Video Organizer is available in a loose-leaf, notebook-ready format. It is also available for download in MyLab Math.

## Key Pedagogical Features

The following key features have been retained and/or updated for the Eighth Edition of the text:

- **Problem-Solving Process** This is formally introduced in Chapter 3 with a four-step process that is integrated throughout the text. The four steps are **Understand, Translate, Solve, and Interpret**. The repeated use of these steps in a variety of examples shows their wide applicability. Reinforcing the steps can increase students' comfort level and confidence in tackling problems.
- **Exercise Sets Revised and Updated** The exercise sets have been carefully examined and extensively revised. Special focus was placed on making sure that even- and odd-numbered exercises are paired and that real-life applications were updated.
- **Examples** Detailed, step-by-step examples were added, deleted, replaced, or updated as needed. Many examples reflect real life. Additional instructional support is provided in the annotated examples.
- **Practice Exercises** Throughout the text, each worked-out example has a parallel Practice exercise. These invite students to be actively involved in the learning process. Students should try each Practice exercise after finishing the corresponding example. Learning by doing will help students grasp ideas before moving on to other concepts. Answers to the Practice exercises are provided at the bottom of each page.
- **Helpful Hints** Helpful Hints contain practical advice on applying mathematical concepts. Strategically placed where students are most likely to need immediate reinforcement, Helpful Hints help students avoid common trouble areas and mistakes.
- **Concept Checks** This feature allows students to gauge their grasp of an idea as it is being presented in the text. Concept Checks stress conceptual understanding at the point-of-use and help suppress misconceived notions before they start. Answers appear at the bottom of the page. Exercises related to Concept Checks are included in the exercise sets.
- **Mixed Practice Exercises** In the section exercise sets, these exercises require students to determine the problem type and strategy needed to solve it just as they would need to do on a test.
- **Integrated Reviews** This unique, mid-chapter exercise set helps students assimilate new skills and concepts that they have learned separately over several sections. These reviews provide yet another opportunity for students to work with "mixed" exercises as they master the topics.
- **Vocabulary Check** This feature provides an opportunity for students to become more familiar with the use of mathematical terms as they strengthen their verbal skills. These appear at the end of each chapter before the Chapter Highlights. Vocabulary, Readiness & Video exercises provide practice at the section level.



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- **Chapter Highlights** Found at the end of every chapter, these contain key definitions and concepts with examples to help students understand and retain what they have learned and help them organize their notes and study for tests.
- **Chapter Review** The end of every chapter contains a comprehensive review of topics introduced in the chapter. The Chapter Review offers exercises keyed to every section in the chapter, as well as Mixed Review exercises that are not keyed to sections.
- **Chapter Test and Chapter Test Prep Videos** The Chapter Test is structured to include those problems that involve common student errors. The **Chapter Test Prep Videos** gives students instant access to a step-by-step video solution of each exercise in the Chapter Test.
- **Cumulative Review** This review follows every chapter in the text (except Chapter 1). Each odd-numbered exercise contained in the Cumulative Review is an earlier worked example in the text that is referenced in the back of the book along with the answer.
- **Writing Exercises**  These exercises occur in almost every exercise set and require students to provide a written response to explain concepts or justify their thinking.
- **Applications** Real-world and real-data applications have been thoroughly updated, and many new applications are included. These exercises occur in almost every exercise set and show the relevance of mathematics and help students gradually and continuously develop their problem-solving skills.
- **Review Exercises** These exercises occur in each exercise set (except in Chapter 1) and are keyed to earlier sections. They review concepts learned earlier in the text that will be needed in the next section or chapter.
- **Exercise Set Resource Icons** Located at the opening of each exercise set, these icons remind students of the resources available for extra practice and support:


### MyLab Math

See Student Resources descriptions on page xvii for details on the individual resources available.

**Exercise Icons** These icons facilitate the assignment of specialized exercises and let students know what resources can support them.

- ▶ Video icon: exercise worked in the Interactive Lecture Series found in MyLab Math.
- △ Triangle icon: identifies exercises involving geometric concepts.
-  Pencil icon: indicates a written response is needed.
-  Calculator icon: optional exercises intended to be solved using a scientific or graphing calculator.

**Group Activities** Found at the end of each chapter, these activities are for individual or group completion, and are usually hands-on or data-based activities that extend the concepts found in the chapter, allowing students to make decisions and interpretations and to think and write about algebra.

**Optional: Calculator Exploration Boxes and Calculator Exercises** The optional Calculator Explorations provide keystrokes and exercises at appropriate places to give students an opportunity to become familiar with these tools. Section exercises that are best completed by using a calculator are identified by  for ease of assignment.



# Student and Instructor Resources

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## STUDENT RESOURCES

### Video Organizer

Designed to help students take notes and work practice exercises while watching the Interactive Lecture Series videos.

- Covers all of the video examples in order.
- Provides prompts with ample space for students to write down key definitions and rules.
- Includes “Play” and “Pause” button icons to prompt students to follow along with the author for some exercises while they try others on their own.
- Includes Student Success Tips Outline and Questions

Available in loose-leaf, notebook-ready format and in MyLab Math.

### Key Concept Activity Lab Workbook

Includes Extension Exercises, Exploration Activities, Conceptual Exercises, and Group Activities. This workbook is available in MyLab Math, or can be packaged in printed form with a text or MyLab Math code.

### Student Solutions Manual

Provides completely worked-out solutions to the odd-numbered section exercises; all exercises in the Integrated Reviews, Chapter Reviews, Chapter Tests, and Cumulative Reviews.

## INSTRUCTOR RESOURCES

### Annotated Instructor’s Edition

Contains all the content found in the student edition, plus the following:

- Answers to even and odd exercises on the same text page
- Teaching Tips throughout the text placed at key points

### Instructor’s Resource Manual with Tests and Mini-Lectures

This resource includes:

- Mini-lectures for each text section
- Additional practice worksheets for each section
- Several forms of tests per chapter—free response and multiple choice
- Answers to all items

### Instructor’s Solutions Manual TestGen®

(These resources are available for download from MyLab Math or from the Instructor’s Resource Center on pearson.com.)

**Instructor-to-Instructor Videos**—available in the Instructor Resources section of the MyLab Math course.

**Online Resources**  
**MyLab Math** (access code required)

**MathXL®** (access code required)



# Resources for Success

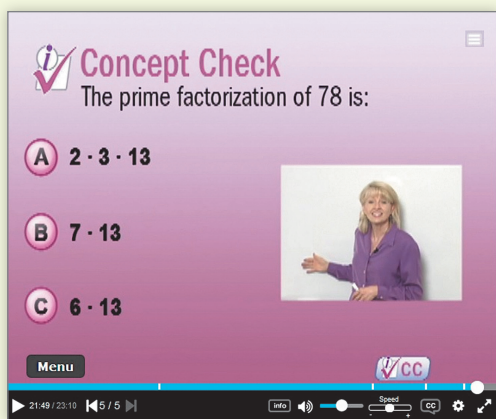
## Get the Most Out of MyLab Math for

### *Prealgebra*, Eighth Edition by Elayn Martin-Gay

Elayn Martin-Gay believes that every student can succeed, and each MyLab course that accompanies her texts is infused with her student-centric approach. The seamless integration of Elayn's award-winning content with the #1 choice in digital learning for developmental math gives students a completely consistent experience from print to MyLab.

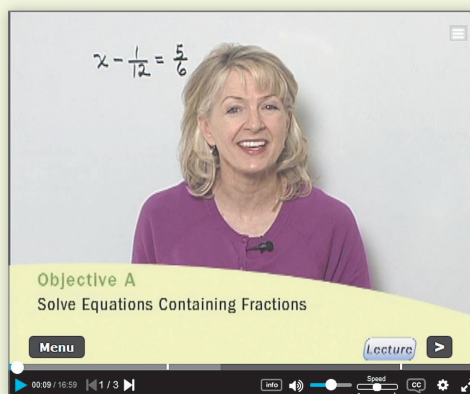
### A Comprehensive and Dynamic Video Program

The **Martin-Gay video program** is 100% presented by Elayn Martin-Gay to ensure consistency with the text. The video program includes full section lectures and shorter objective level videos, and an intuitive navigation menu and pop-ups that reinforce key definitions.

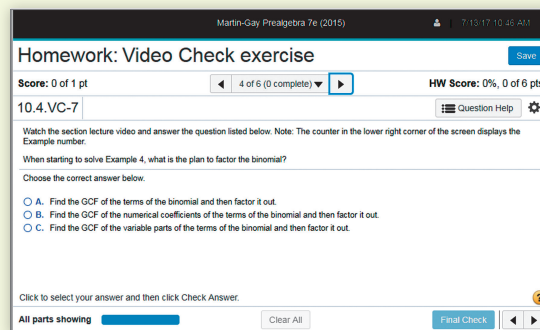


All videos can be assigned as a **media assignment** in the Assignment Manager, to ensure that students are getting the most out of their MyLab resources.

Additionally, **Video Check questions** ensure that students have viewed and understood the key concepts from the section lecture videos.



Within the section lecture videos, **Interactive Concept Checks** measure a student's understanding of key concepts and common trouble spots. Concept Checks ask students to try a question on their own within the video, after which Elayn Martin-Gay explains why they were correct or incorrect.



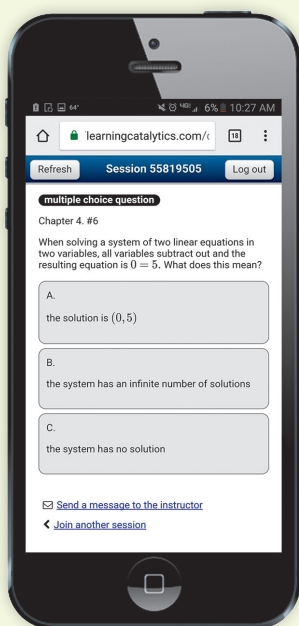
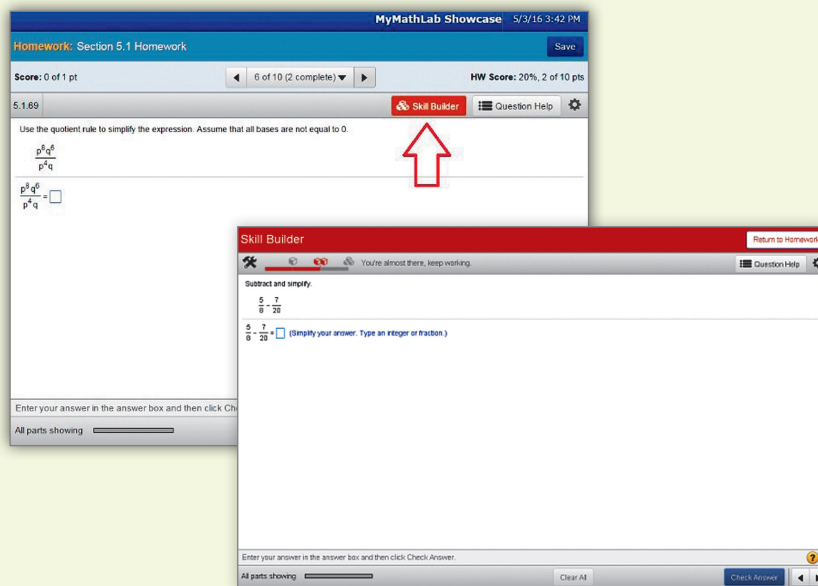
Additional hallmark Martin-Gay video types include Student Success Tip videos and Chapter Test Prep videos. **Student Success Tip videos** are in short segments designed to be daily reminders to stay organized and to study. **Chapter Test Prep videos**, a Martin-Gay innovation, help students during their most teachable moment—when they are preparing for a test—with step-by-step solutions for the exercises in the Chapter Test.

## New Tools Improve Preparedness and Personalize Learning

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**New! Getting Ready for the Test video solutions** cover every Getting Ready for the Test exercise. These come at the end of each chapter to give students an opportunity to assess if they understand the big picture concepts of the chapter, and help them focus on avoiding common errors.

**New! Skill Builder** exercises offer just-in-time additional adaptive practice. The adaptive engine tracks student performance and delivers questions to each individual that adapt to his or her level of understanding. This new feature allows instructors to assign fewer questions for homework, allowing students to complete as many or as few questions needed.



## New Ways to Engage Students

### New! Learning Catalytics

Martin-Gay-specific questions are pre-built and available through MyLab Math. Learning Catalytics is an interactive student response tool that uses students' smartphones, tablets, or laptops to engage them in more sophisticated tasks and thinking. **Getting Ready for the Test** exercises marked in blue in the text are pre-built in Learning Catalytics to use in class. These questions can be found in Learning Catalytics by searching for "MGPre".

**New! Vocab and Readiness questions** in MyLab Math have been expanded to 100% coverage, and are now available with a new **Drag and Drop functionality!** Drag and Drop exercises allow students to manually select elements of the question, such as expressions, words, graphs, or images, and place them into a designated target area.

## Easier Start-Up for Instructors

**Enhanced Sample Assignments** make course set-up easier by giving instructors a starting point for each section. Each assignment has been carefully curated for this specific text, and includes a thoughtful mix of question types.

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There are many people who helped me develop this text, and I will attempt to thank some of them here. Cindy Trimble was *invaluable* for contributing to the overall accuracy of the text. Gina Linko and Patty Bergin provided guidance throughout the production process.

A very special thank you goes to my editor, Mary Beckwith, for being there 24/7/365, as my students say. And, my thanks to the staff at Pearson for all their support: Barbara Atkinson, Alicia Frankel, Michael Hirsch, Chris Hoag, Paul Corey, Michelle Renda, Jenny Crum and Lauren Schur among many others.

I would like to thank the following reviewers for their input and suggestions that have affected this and previous editions:

Lisa Angelo, <i>Bucks Community College</i>	Teresa Hasenauer, <i>Indian River College</i>
Victoria Baker, <i>Nicholls State College</i>	Julia Hassett, <i>Oakton Community College</i>
Teri Barnes, <i>McLennan Community College</i>	Jeff Koleno, <i>Lorain County Community College</i>
Laurel Berry, <i>Bryant &amp; Stratton</i>	Judy Langer, <i>Westchester Community College</i>
Thomas Blackburn, <i>Northeastern Illinois University</i>	Sandy Lofstock, <i>St. Petersburg College</i>
Gail Burkett, <i>Palm Beach Community College</i>	Stan Mattoon, <i>Merced College</i>
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Cheryl Gibby, <i>Cypress College</i>	Katerina Vishnyakova, <i>Collin County Community College</i>
Kathryn Gunderson, <i>Three Rivers Community College</i>	Corey Wadlington, <i>West Kentucky Community and Technical College</i>
Elizabeth Hamman, <i>Cypress College</i>	Edward Wagner, <i>Central Texas College</i>
Craig Hardesty, <i>Hillsborough Community College</i>	Jenny Wilson, <i>Tyler Junior College</i>
Lloyd Harris, <i>Gulf Coast Community College</i>	

I would also like to thank the following dedicated group of instructors who participated in our focus groups, Martin-Gay Summits, and our design review for the series. Their feedback and insights have helped to strengthen this edition of the text. These instructors include:

Billie Anderson, <i>Tyler Junior College</i>	Cheryl Cantwell, <i>Seminole Community College</i>
Cedric Atkins, <i>Mott Community College</i>	Jackie Cohen, <i>Augusta State College</i>
Lois Beardon, <i>Schoolcraft College</i>	Julie Dewan, <i>Mohawk Valley Community College</i>
Laurel Berry, <i>Bryant &amp; Stratton</i>	Janice Ervin, <i>Central Piedmont Community College</i>
John Beyers, <i>University of Maryland</i>	Richard Fielding, <i>Southwestern College</i>
Bob Brown, <i>Community College of Baltimore County–Essex</i>	Cindy Gaddis, <i>Tyler Junior College</i>
Lisa Brown, <i>Community College of Baltimore County–Essex</i>	Nita Graham, <i>St. Louis Community College</i>
NeKeith Brown, <i>Richland College</i>	Pauline Hall, <i>Iowa State College</i>
Gail Burkett, <i>Palm Beach Community College</i>	Pat Hussey, <i>Triton College</i>

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Dorothy Johnson, *Lorain County Community College*  
 Sonya Johnson, *Central Piedmont Community College*  
 Irene Jones, *Fullerton College*  
 Paul Jones, *University of Cincinnati*  
 Kathy Kopelousous, *Lewis and Clark Community College*  
 Nancy Lange, *Inver Hills Community College*  
 Judy Langer, *Westchester Community College*  
 Lisa Lindloff, *McLinnan Community College*  
 Sandy Lofstock, *St. Petersburg College*  
 Kathy Lovelle, *Westchester Community College*  
 Jean McArthur, *Joliet Junior College*  
 Kevin McCandless, *Evergreen Valley College*  
 Daniel Miller, *Niagara County Community College*  
 Marica Molle, *Metropolitan Community College*  
 Carol Murphy, *San Diego Miramar College*  
 Greg Noyen, *Fullerton College*  
 Eric Oilila, *Jackson Community College*  
 Linda Padilla, *Joliet Junior College*  
 Davidson Pierre, *State College of Florida*  
 Marilyn Platt, *Gaston College*  
 Ena Salter, *Manatee Community College*  
 Carole Shapero, *Oakton Community College*  
 Janet Sibol, *Hillsborough Community College*  
 Anne Smallen, *Mohawk Valley Community College*  
 Barbara Stoner, *Reading Area Community College*  
 Jennifer Strehler, *Oakton Community College*  
 Ellen Stutes, *Louisiana State University Elinice*  
 Tanomo Taguchi, *Fullerton College*  
 MaryAnn Tuerk, *Elsin Community College*  
 Walter Wang, *Baruch College*  
 Leigh Ann Wheeler, *Greenville Technical Community College*  
 Valerie Wright, *Central Piedmont Community College*

A special thank you to those students who participated in our design review: Katherine Browne, Mike Bulfin, Nancy Canipe, Ashley Carpenter, Jeff Chojnachi, Roxanne Davis, Mike Dieter, Amy Dombrowski, Kay Herring, Todd Jaycox, Kaleena Levan, Matt Montgomery, Tony Plese, Abigail Polkinghorn, Harley Price, Eli Robinson, Avery Rosen, Robyn Schott, Cynthia Thomas, and Sherry Ward.

*Elayn Martin-Gay*

## Personal Acknowledgements

I would like to personally thank my extended family. Although this list has grown throughout the years, it still warrants mentioning in my texts as each of these family members has contributed to my work in one way or another – from suggesting application exercises with data and updating/upgrading my computer to understanding that I usually work on “Vacations.” I am deeply grateful to them all:

Clayton, Bryan (in heaven), Eric, Celeste, and Tové Gay; Leo and Barbara Miller; Mark and Madison Martin and Carrie Howard; Stuart and Earline Martin; Karen Martin Callac Pasch (in heaven); Michael, Christopher, Matthew, Nicole, and Jessica Callac; Dan Kirk; Keith, Mandy, Erin, and Clayton McQueen, Bailey Martin, Ethan, Avery, and Mia Barnes; Melissa and Belle Landrum.

## About the Author

Elayn Martin-Gay has taught mathematics at the University of New Orleans for more than 25 years. Her numerous teaching awards include the local University Alumni Association’s Award for Excellence in Teaching, and Outstanding Developmental Educator at University of New Orleans, presented by the Louisiana Association of Developmental Educators.

Prior to writing textbooks, Elayn Martin-Gay developed an acclaimed series of lecture videos to support developmental mathematics students in their quest for success. These highly successful videos originally served as the foundation material for her texts. Today, the videos are specific to each book in the Martin-Gay series.

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The author has also created Chapter Test Step Videos to help students during their most “teachable moment”—as they prepare for a test—along with Instructor-to-Instructor videos that provide teaching tips, hints, and suggestions for each developmental mathematics course, including basic mathematics, prealgebra, beginning algebra, and intermediate algebra.

Elayn is the author of 12 published textbooks as well as multimedia, interactive mathematics, all specializing in developmental mathematics courses. She has also published series in Algebra 1, Algebra 2, and Geometry. She has participated as an author across the broadest range of educational materials: textbooks, videos, tutorial software, and courseware. This provides an opportunity of various combinations for an integrated teaching and learning package offering great consistency for the student.

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