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ANNOTATED INSTRUCTOR'S EDITION

Developmental Mathematics

Second Edition

Michael Sullivan, III

Joliet Junior College

Katherine R. Struve

Columbus State Community College

Janet Mazarella

Southwestern College

with contributions by

Jessica Bernards

Portland Community College

Wendy Fresh

Portland Community College



330 Hudson Street, NY NY 10013

VP, Courseware Portfolio Management: Chris Hoag
Director, Courseware Portfolio Management: Michael Hirsch
Courseware Portfolio Manager: Mary Beckwith
Courseware Portfolio Management Assistant: Alison Oehman
Content Producer: Tamela Ambush
Managing Producer: Karen Wernholm
Producer: Nicholas Sweeney
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Product Marketing Manager: Kyle DiGiannantonio
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To my wife, Yolanda, for her friendship, support, and encouragement.

—Michael Sullivan

To my daughters, Anne and Laura Struve, who have taught me how to be a better teacher.

—Katherine R. Struve

To my students, who have inspired me more than I can say; and to the two of whom I am most proud, my children, Kellen and Jillian.

—Janet Mazarella

About the Authors



With training in mathematics, statistics, and economics, Michael Sullivan, III has a varied teaching background that includes 27 years of instruction in both high school and college-level mathematics. He is currently a full-time professor of mathematics at Joliet Junior College. Michael has numerous textbooks in publication, including an Introductory Statistics series and a Precalculus series, which he writes with his father, Michael Sullivan.

Michael believes that his experiences writing texts for college-level math and statistics courses give him a unique perspective as to where students are headed once they leave the developmental mathematics tract. This experience is reflected in the philosophy and presentation of his developmental text series. When not in the classroom or writing, Michael enjoys spending time with his three children, Michael, Kevin, and Marissa, and playing golf. Now that his two sons are getting older, he has the opportunity to do both at the same time!



Kathy Struve has been a classroom teacher for nearly 35 years, first at the high school level and, for the past 27 years, at Columbus State Community College. Kathy embraces classroom diversity: diversity of students' age, learning styles, and previous learning success. She is aware of the challenges of teaching mathematics at a large, urban community college, where students have varied mathematics backgrounds and may enter college with a high level of mathematics anxiety.

Kathy served as Lead Instructor of the Developmental Algebra sequence at Columbus State, where she developed curriculum, conducted workshops, and provided leadership to adjunct faculty in the mathematics department. She embraces the use of technology in instruction, and has taught web and hybrid classes in addition to traditional face-to-face and emporium-style classes. She is always looking for ways to more fully involve students in the learning process. In her spare time Kathy enjoys spending time with her two adult daughters, her four granddaughters, and biking, hiking, and traveling with her husband.



Born and raised in San Diego county, Janet Mazarella spent her career teaching in culturally and economically diverse high schools before taking a position at Southwestern College 25 years ago. Janet has taught a wide range of mathematics courses from arithmetic through calculus for math/science/engineering majors and has training in mathematics, education, engineering, and accounting.

Janet has worked to incorporate technology into the curriculum by participating in the development of Interactive Math and Math Pro. At Southwestern College, she helped develop the self-paced developmental mathematics program. In addition, Janet was the Dean of the School of Mathematics, Science, and Engineering, the Chair of the Mathematics Department, the faculty union president, and the faculty coordinator for Intermediate Algebra. In the past, free time consisted of racing motorcycles off-road in the Baja 500 and rock climbing, but recently she has given up the adrenaline rush of these activities for the thrill of traveling in Europe.

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Preface

We would like to thank the reviewers, class testers, and users of the previous edition of *Developmental Mathematics* who helped to make the book an overwhelming success. Their thoughtful comments and suggestions provided strong guidance for improvements in the second edition that we believe will enhance this solid, student-friendly text.

Developmental Mathematics serves a diverse group of students. Some of them are new to algebra, while others were introduced to the material but have not yet grasped all the concepts. Still other students realized success in the course in the past but need a refresher. Not only do the backgrounds of students vary with respect to their mathematical abilities, but students' motivation, reading level, and study skills also range considerably.

This diversity makes teaching developmental mathematics challenging. It is imperative that texts recognize the diversity of the classroom and address the array of needs of the students.

Developmental Mathematics introduces students to the logic and precision of mathematics. We expect students to leave the course with an appreciation of this precision as well as of the power of mathematics. Our students need to understand that the concepts we teach in this course form the basis for future mathematics courses. Once they have a conceptual understanding of algebra, students recognize that the material is not merely a series of unconnected topics. Instead, they see a story in which each new chapter builds on concepts learned in previous chapters.

To reinforce this idea, we remind our students of a helpful fact—mathematics is about taking a problem and reducing it to another problem that they have already seen. Reducing a problem to its component parts makes it easier to solve and helps students to see the forest for the trees (and, to carry the metaphor further, prevent them from feeling that they are lost in the woods).

In short, to address the many needs of today's students, we established the following as our goals for this text:

- Provide students with a strong conceptual foundation in mathematics through a clear and thorough presentation of concepts.
- Offer comprehensive exercise sets that build students' skills, show intriguing applications of mathematics, begin to build mathematical thinking skills, and reinforce mathematical concepts.
- Provide students with ample opportunity to see the connections among the topics learned in the course.
- Present a variety of study aids and tips so students quickly come to view the text as a useful and reliable tool that can increase success in the course.

New to the Second Edition

The revision of this text takes advantage of MyLab Math as a tool for learning. To address the needs of students who are exposed to the material almost exclusively through MyLab Math, we have introduced the following new features to MyLab Math based on some of the hallmark features of the text.

- Discovery activities using **applets** have been developed. These explorations are carefully crafted to allow students to develop understanding of mathematical concepts through experiential learning. The applets and guided exercises that utilize the applets are found in MyLab Math. The applets may also be accessed using the QR code at the beginning of the section.
- **Guided Exercises** are now available in MyLab Math based on the popular Showcase Examples. Showcase Examples from the text are easy to recognize with the words “How To” in the example title and provide step-by-step solutions

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to examples. This example structure was written into 55 *new* MyLab Math exercises that require students to respond to questions as the steps to solving problems are developed, similar to the “Help Me Solve This” feature of MyLab Math. This keeps the student completely engaged in the learning process and develops their conceptual understanding of the content. These exercises are easy to identify in the Assignment Builder as they are designated “How-To-#. # Ex #-<title abbreviation>”. For example, “How-To-2.2 Ex 6-Solve a Linear Equation”.

- **Quick Response (QR) codes**  now appear at each section opener, at section-level exercises, and as part of the Chapter Tests. Students can simply use a QR scanner from their smartphone for easy access to the popular Author in Action lecture videos, select end-of-section exercise videos, the discovery applets, and the Chapter Test Prep videos.
- The authors developed a **Premade Author-Created MyLab Math** course that utilizes the latest MyLab Math features. Each section has two MyLab Math assignments.
 - The first assignment is a multimedia assignment that incorporates the Author in Action lecture videos, the new discovery applet exercises, the new How To guided exercises, and the Quick Check exercises from the text. The Quick Check exercises follow many of the examples in the text. To assist students in utilizing the text, the Textbook learning aid for each Quick Check exercise will link *directly* to the corresponding example in the text. All learning aids with the exception of “View an Example” will be available for this portion of the homework. Our experience as instructors has been that too many students rely on this learning aid while doing homework, thereby reducing the effect of homework as students simply mimic the View an Example content.
 - The second assignment is based on the Skill Building and Mixed Practice exercises from the text. Skill building exercises are tied to objectives within the text, so the Textbook learning aid will link directly to the objective within the section. The idea is to reduce the amount of guidance provided to the student (compared with Quick Check exercises) so they are more responsible for identifying the problem type. The Mixed Practice exercises are based on multiple concepts learned within the section or text, so the Textbook learning aid is linked to the section. The student must determine the problem type based on Quick Check and Skill Building exercise experience. The “View an Example” learning aid is disabled for this exercise set as well. Because this text has Skill Builder available in MyLab Math, you may consider reducing the number of exercises in the second assignment. By checking the Skill Builder box, the assignments will adapt to provide support exercises personalized to each student’s needs.

Content Change

- Systems of linear equations with dependent systems no longer have a solution of simply “infinitely many solutions.” Rather, we express the solution of the dependent system using set builder notation. For example, if $3x + y = 1$ is one of the equations in the dependent system, the solution is expressed as $\{(x, y) \mid 3x + y = 1\}$.

Develop an Effective Text for Use In and Out of the Classroom

Given the hectic lives led by most students, coupled with the anxiety and trepidation with which they approach this course, an outstanding developmental mathematics text must provide pedagogical support that makes the text valuable to students as they study and do assignments. Pedagogy must be presented within a framework that teaches students how to study math; pedagogical devices must also address what students see as the “mystery” of mathematics—and solve that mystery.

To encourage students and to clarify the material, we developed a set of pedagogical features that help students develop good study skills, garner an understanding of the connections between topics, and work smarter in the process. The pedagogy used is

based upon the more than 70 years of classroom teaching experience that the authors bring to this text.

Examples are often the determining factor in how valuable a textbook is to a student. Students look to examples to provide them with guidance and instruction when they need it most—the times when they are away from the instructor and the classroom. We have developed two example formats in an attempt to provide superior guidance and instruction for the students.

Innovative Examples

The innovative *Left-to-Right Example* has a two-column format in which annotations are provided to the **left** of the algebra, rather than the right, as is the practice in most texts. Because we read from **left to right**, placing the annotation on the left will make more sense to the student. It becomes clear that the annotation describes what we are about to do instead of what was just done. The annotations may be thought of as the teacher's voice offering clarification immediately before writing the next step in the solution on the board. Consider the following:

EXAMPLE 3

Combining Like Terms to Solve a Linear Equation

Solve the equation: $2x - 6 + 3x = 14$

Solution

$$\begin{array}{r}
 2x - 6 + 3x = 14 \\
 \text{Combine like terms:} \quad 5x - 6 = 14 \\
 \text{Add 6 to both sides of the equation:} \quad 5x - 6 + 6 = 14 + 6 \\
 5x = 20 \\
 \text{Divide both sides by 5:} \quad \frac{5x}{5} = \frac{20}{5} \\
 x = 4
 \end{array}$$

Check

$$\begin{array}{r}
 2x - 6 + 3x = 14 \\
 \text{Substitute 4 for } x \text{ in the original equation:} \quad 2(4) - 6 + 3(4) \stackrel{?}{=} 14 \\
 8 - 6 + 12 \stackrel{?}{=} 14 \\
 14 = 14 \quad \text{True}
 \end{array}$$

The solution of the equation is 4, or the solution set is $\{4\}$.

Quick ✓

In Problems 6–9, solve each equation.

6. $7b - 3b + 3 = 11$

7. $-3a + 4 + 4a = 13 - 27$

8. $6c - 2 + 2c = 18$

9. $-12 = 5x - 3x + 4$

Showcase Examples

Showcase Examples are used strategically to introduce key topics or important problem-solving techniques. These examples provide “how-to” instruction by offering a guided, step-by-step approach to solving a problem. Students can then immediately see how each of the steps is employed. We remind students that the *Showcase Example* is meant to provide “how-to” instruction by including the words “how to” in the example title. The *Showcase Example* has a three-column format in which the left column describes a step, the middle column provides a brief annotation, as needed, to explain the step, and the right column presents the algebra. With this format, students can see each step in the problem-solving process in context so that the steps make more sense. This approach is more effective than simply stating each step in the text.

EXAMPLE 6 How to Solve a Linear Equation in One VariableSolve the equation: $2(z - 4) + 3z = 4 - (z + 2)$ **Step-by-Step Solution****Step 1:** Remove any parentheses using the Distributive Property.

$$\begin{aligned} 2(z - 4) + 3z &= 4 - (z + 2) \\ 2z - 8 + 3z &= 4 - z - 2 \end{aligned}$$

Step 2: Combine like terms on each side of the equation.

$$5z - 8 = 2 - z$$

Step 3: Use the Addition Property of Equality to get the terms with the variable on one side of the equation and the constants on the other side.

$$\begin{aligned} \text{Add } z \text{ to both sides of the equation:} & \quad 5z - 8 + z = 2 - z + z \\ \text{Simplify:} & \quad 6z - 8 = 2 \\ \text{Add } 8 \text{ to both sides of the equation:} & \quad 6z - 8 + 8 = 2 + 8 \\ \text{Simplify:} & \quad 6z = 10 \end{aligned}$$

Step 4: Use the Multiplication Property of Equality to get the coefficient of the variable to be 1.

$$\begin{aligned} \text{Divide both sides of the equation by } 6: & \quad \frac{6z}{6} = \frac{10}{6} \\ \text{Simplify:} & \quad z = \frac{5}{3} \end{aligned}$$

Step 5: Check the solution to verify that it satisfies the original equation.

The check is left to you.

The solution of the equation is $\frac{5}{3}$, or the solution set is $\left\{\frac{5}{3}\right\}$.**Quick ✓****17. True or False** To solve the equation $13 - 2(7x + 1) + 8x = 12$, the first step is to subtract 2 from 13 and get $11(7x + 1) + 8x = 12$.*In Problems 18 and 19, solve each equation.*

18. $-9x + 3(2x - 3) = -10 - 2x$ **19.** $3 - 4(p + 5) = 5(p + 2) - 12$

Quick Check Exercises

Placed at the conclusion of most examples, the *Quick Check* exercises provide students with an opportunity for immediate reinforcement. By working the problems that mirror the example just presented, students get instant feedback and gain confidence in their understanding of the concept. All *Quick Check* exercise answers are provided in the back of the text. **The *Quick Check* exercises should be assigned as homework to encourage students to read, consult, and use the text regularly.** Ideally, these exercises should be completed within one day of class.

Superior Exercise Sets: Paired with Purpose

Students learn algebra by doing algebra. The superior end-of-section exercise sets in this text provide students with ample practice of both procedures and concepts. The exercises are paired and present problem types with every possible derivative. The exercises also present a gradual increase in difficulty level. The early, basic exercises keep the student's focus on as few "levels of understanding" as possible. The later or higher-numbered exercises are "multi-task" (or Mixed Practice) exercises where students are required to utilize multiple skills, concepts, or problem-solving techniques.

Throughout the textbook, the exercise sets are grouped into eight categories—some of which appear only as needed:

1. **Are You Prepared For This Section?** problems are located at the opening of the section. They are problems that address prerequisite material for the section, along with page references, so students may remediate, if necessary. Answers to the Prepared? . . . problems appear as a footnote on the page.
2. **Quick Check** exercises, which provide the impetus to get students into the text, follow most examples and are numbered sequentially as the first problems in each section exercise set. By doing these problems as homework and the first exercises attempted, the student is directed into the material in the section. If a student gets stuck, he or she will learn that the example immediately preceding the Quick Check exercise illustrates the concepts needed to solve the problem.
3. **Building Skills** exercises are skill development problems that develop the student's understanding of the procedures and skills in working with the methods presented in the section. These exercises can be linked back to a single learning objective in the section. Notice that the Building Skills problems begin the numbering scheme where the Quick Checks leave off. For example, if the last Quick Check exercise is Problem 20, then we begin the Building Skills exercises with Problem 21. This serves as a reminder that Quick Check exercises should be assigned as homework.
4. **Mixed Practice** exercises are also skill development problems, but they offer a comprehensive assessment of the skills learned in the section by asking problems that relate to more than one concept or objective. In addition, problems from previous sections may be presented so students must first recognize the type of problem and then employ the appropriate technique to solve the problem.
5. **Applying the Concepts** exercises are problems that allow students to see the relevance of the material learned within the section. Problems in this category either are situational problems that use material learned in the section to solve “real-world” problems or are problems that ask a series of questions to enhance a student's conceptual understanding of the mathematics presented in the section.
6. **Extending the Concepts** exercises are problems that go beyond the basics. Within this block of exercises an instructor will find a variety of problems to sharpen students' critical-thinking skills.
7. **Explaining the Concepts** problems require students to think about the big picture concepts of the section and express these ideas in their own words. It is our belief that students need to improve their ability to communicate complicated ideas both orally and in writing. When they are able to explain mathematical methods or concepts to another individual, they have truly mastered the ideas. These problems can serve as a basis for classroom discussion or can be used as writing assignments.
8. Finally, we include **Technology Exercises**. Instructors' philosophies about the use of graphing technology, such as graphing calculators or Desmos, to solve problems vary considerably. Because instructors disagree about the value of these tools, we have made an effort to make graphing technology entirely optional. When appropriate, technology exercises are included at the close of a section's exercise set. Also included in the technology exercises are the new applet explorations. The applets may be found in MyLab Math or using the Quick Response (QR) code located in the section opener ribbon.

Problem Icons In addition to the carefully structured categories of exercises, selected problems are flagged with icons.

- Problems whose number is green have complete worked-out solutions found in MyLab Math.
-  These problems focus on geometry concepts.
-  A calculator will be useful in working the problem.

Hallmark Features

Author in Action Videos

The Author in Action videos are videos of the authors presenting the content. Most of the videos are from the authors' actual classroom lectures. This makes the videos authentic and gives the viewer the sense of participating in the lecture. The videos are tied to the objectives and under 12 minutes in length. For those objectives that require more than 12 minutes, we have multiple videos. Students are alerted to the availability of a video with the  icon. The videos are available in MyLab Math, the Multimedia Textbook (in MyLab Math), or through a Quick Response (QR) code  located in the section opener ribbon. The videos are captioned in English and Spanish.

Video Notebook

A Video Notebook is available, which is ideal for online, emporium/redesign courses, or inverted (flipped) classrooms. This notebook assists students in taking thorough, organized, and understandable notes as they watch the Author in Action videos by asking students to complete definitions, procedures, and examples based on the content of the videos. The Video Notebook is available as an unbound, three-hole punched workbook—students can insert additional pages of notes or homework to begin a course notebook.

Quick Check Exercises: Encourage Study Skills that Lead to Independent Learning

What is one of the overarching goals of an education? We believe it is to learn to solve problems independently. In particular, we would like to see students develop the ability to pick up a text or manual and teach themselves the skills they need. In our mathematics classes, however, we are often frustrated because students rarely read the text and often struggle to understand the concepts independently.

To encourage students to use the text more effectively and to help them achieve greater success in the course, we have structured the exercises in our text differently from other mathematics textbooks. The aim of this structure is to get students “into the text” in order to increase their ability and confidence to work any math problem—particularly when they are away from the classroom and an instructor who can help.

Each section's exercise set begins with the *Quick Check* exercises. The *Quick Checks* are consecutively numbered. The end-of-section exercises begin their numbering scheme based on where the *Quick Checks* end. For example:

- Section 1.2: *Quick Checks* end at Problem 42, so the end-of-section exercise set starts with Problem 43 (see page 14).
- Section 1.3: *Quick Checks* end at Problem 58, so the end-of-section exercise set starts with Problem 59 (see page 25).

The *Quick Checks* follow most examples and provide the platform for students to get “into the text.” By integrating these exercises into the exercise set, students are directed to the instructional material in that section. Our hope is that students will then become more aware of the instructional value of the text and will be more likely to succeed when studying away from the classroom and the instructor.

Answer annotations to Quick Checks and exercises have been placed directly next to each problem in the Annotated Instructor's Edition to make it easier for instructors to create assignments.

We have used the same background color for the Quick Checks and the exercise sets to reinforce the connection between them visually. The colored background will also make the Quick Checks easier to find on the page.

Answers to Selected Exercises at the back of the text integrate the answers to *every* Quick Check exercise with the answers to *every odd* problem from the section exercise sets.

Study Skills and Student Success

We have included study skills and student success as regular themes throughout this text starting with *Section 1.1 Success in Mathematics*. In addition to this dedicated section that covers many of the basics that are essential to success in any math course, we have included several recurring study aids that appear in the margin. These features are designed to anticipate the student's needs and to provide immediate help—as if the teacher were looking over his or her shoulder. These margin features include: *In Other Words*; *Work Smart*; and *Work Smart: Study Skills*.

Section 1.1 Success in Mathematics focuses the student on basic study skills, including what to do during the first week of the term; what to do before, during, and after class; how to use the text effectively; and how to prepare for an exam.

In Other Words helps to address the difficulty that students have in reading mathematically precise definitions and theorems by explaining them in easier to understand language.

Work Smart provides “tricks of the trade” hints, tips, reminders, and alerts. It also identifies some common errors to avoid and helps students work more efficiently.

Work Smart: Study Skills reminds students of study skills that will help them to succeed at various points in the course. Attention to these practices will help them to become better, more proficient learners.

Test Preparation and Student Success

The Chapter Tests in this text and the companion Chapter Test Prep Videos have been designed to help students make the most of their valuable study time.

Chapter Test In preparation for their classroom test, students should take the practice test to make sure they understand the key topics in the chapter. The exercises in the Chapter Tests have been crafted to reflect the level and types of exercises a student is likely to see on a classroom test.

Chapter Test Prep Videos The Chapter Test Prep Videos provide students with help at the critical juncture when they are studying for a test. The videos present step-by-step solutions to the exact exercises found in each of the book's Chapter Tests. Easy video navigation allows students instant access to the worked-out solutions to the exercises they want to study or review. These videos are available in MyLab Math or may be accessed using the QR code in the Chapter Test ribbon.

Seeing the Connections: The Big Picture

Another important role of the pedagogy in this text is to help students see and understand the connection among the mathematical topics presented. Several section-opening and margin features help to reinforce connections:

The Big Picture: Putting It Together (Chapter Opener) This feature is based on how we start each chapter in the classroom—with a quick sketch of what we plan to cover. Before tackling a chapter, we tie concepts and techniques together by summarizing material covered previously and then relate these ideas to material we are about to discuss. It is important for students to understand that content truly builds from one chapter to the next. We find that students need to be reminded that the familiar operations of addition, subtraction, multiplication, and division are being applied to different or more complex objects.

Are You Prepared for This Section? As part of this building process, we think it is important to remind students of specific skills that they will need from earlier in the course to be successful within a given section. The *Are You Prepared?* . . . feature that begins each section not only provides a list of prerequisite skills that a student should understand before tackling the content of a new section, but also acts as a short set of problems to test students' preparedness. Answers to the problems are provided in a footnote on the same page, and a cross-reference to the material in the text is provided so that the student can remediate when necessary.

Sample Preface. Not for Distribution.

Mixed Practice These problems exist within each end-of-section exercise set and draw upon material learned from multiple objectives. Sometimes, these problems simply represent a mixture of problems presented within the section, but they also may include a mixture of problems from various sections. For example, students may need to distinguish between linear and quadratic equations or students may need to distinguish between the direction *simplify* versus the direction *solve*.

Putting the Concepts Together (Mid-Chapter Review) Each chapter has a group of exercises at the appropriate point in the chapter, entitled *Putting the Concepts Together*. These exercises serve as a review—synthesizing material introduced up to that point in the chapter. The exercises in these mid-chapter reviews are carefully chosen to assist students in seeing the “big picture.”

Cumulative Review Learning algebra is a building process, and building involves considerable reinforcement. At the end of Chapters 1–6, the cumulative review exercises are titled “Getting Ready for Chapter X” where X is the next chapter number. Chapter 7 ends the Prealgebra portion of the text so the cumulative review exercises are titled “Getting Ready for Elementary Algebra.” Each exercise in the Getting Ready problem set has a section and example reference to help students review the material. The Cumulative Review exercises at the end of each odd-numbered chapter, starting with Chapter 9, help students to reinforce and solidify their knowledge by revisiting concepts and using them in context. A Cumulative Review for even Chapters 8–18 is available on the Instructors Resource Center. If students complete the cumulative reviews, studying for the final exam should be fairly easy.

Getting Ready for Algebra Students who leave a PreAlgebra or College Arithmetic course are often overwhelmed by algebraic expressions and equations when they enter the Elementary Algebra portion of the developmental sequence. To assist students in this transition, we have included subsections within many sections of the PreAlgebra portion of the text entitled “Getting Ready for Algebra.” The idea behind these examples and exercises is to expose students to algebraic concepts using the key skills presented within the section. Algebra is first introduced in Sections 2.5 through 2.8 by presenting algebraic skills such as evaluating algebraic expressions, combining like terms, and solving equations that involve only integers. Beginning in Chapter 3, *Rational Numbers Expressed as Fractions*, many of the subsequent sections have a “Getting Ready for Algebra” subsection in which these same algebraic skills are presented in the context of the number system presented in that chapter (see page 158). The expectation is that these subsections serve a dual purpose of developing the skills working with the number system of the chapter and easing students’ apprehension of “working with letters.”

Getting Ready for Intermediate Algebra The transition from the Elementary Algebra portion of the course to the Intermediate Algebra part can be difficult for students. As instructors, we want our students to be aware of any deficiencies they may have in their mathematical preparation when starting Intermediate Algebra. We have written two transition quizzes for students, with one appearing after Chapter 12 and another after Chapter 13, to assess student preparedness. The answers to all problems on the quizzes are located in the back of the text. Further, a cross reference to the material presented earlier in the course is provided so that students may review important concepts, if necessary.

Co-Requisite Courses and Redesign

Co-requisite remediation is becoming popular as a means for streamlining the pathway to college-level courses. This text has successfully been utilized in co-requisite environments. In particular, this text has been used as the developmental mathematics component by being paired with Sullivan’s *Statistics: Informed Decisions Using Data 5/e* and Sullivan’s *Precalculus* series.

In addition, the revision of *Developmental Mathematics* acknowledges the benefits of emporium-style education. The new MyLab Math features were created with this style of delivery in mind. In fact, the authors have taught using the fixed emporium model, in which students enroll in a specific section of a course where course content is delivered via video along with the new guided MyLab Math exercises and explorations.

In Closing

When we started writing this textbook, we discussed improvements we could make in coverage; in staples such as examples and problems; and in any pedagogical features that we found truly useful. After writing and rewriting, and reading many thoughtful reviews from instructors, we focused on the following features of the text to set it apart.

- The innovative ***Left-to-Right Examples*** and ***Showcase Examples*** provide students with superior guidance and instruction when they need it most—when they are away from the instructor and the classroom. Each of the margin features ***In Other Words***, ***Work Smart***, and ***Work Smart: Study Skills*** are designed to improve study skills, make the textbook easier to navigate, and increase student success.
- **Exercise Sets**—The exercise sets are structured to assess student understanding of vocabulary, concepts, meaningful repetition, problem solving, and applications. The exercise sets are graded in difficulty level to build confidence and to enhance students' mathematical thinking. The ***Quick Check*** exercises provide students with immediate reinforcement and instant feedback to determine their understanding of the concepts presented in the examples.
- **The Big Picture**—Each section opens with *Are You Prepared For This Section?* problems that allows students to review material learned earlier in the course that is needed in the upcoming section. ***Mixed Practice*** problems require students to utilize material learned from multiple objectives to solve a problem. Often, these problems require students to first determine the correct approach to solving the problem prior to actually solving it. ***Putting the Concepts Together*** helps students see the big picture and provide a structure for learning each new concept and skill in the course.

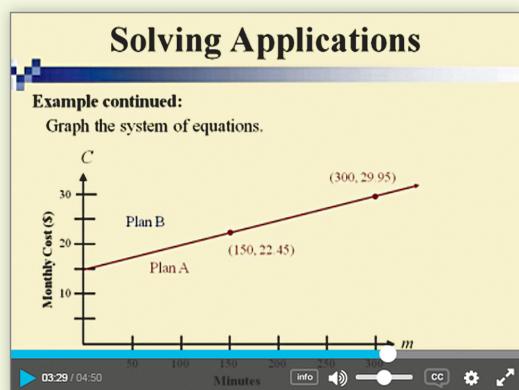
Resources for Success

MyLab™ Math Online Course for Sullivan/ Struve/Mazzarella, *Developmental Mathematics*, 2nd edition

To give students a consistent tone, voice, and teaching method, this text's approach is tightly integrated throughout its accompanying MyLab Math course, making learning the material as seamless as possible. This course contains all of MyLab Math's powerful features, in addition to specific Sullivan/Struve/Mazzarella tools.

Premade Author-Created Course

A premade course developed by the authors and contributors with a guided learning path for students allows instructors the ease of quick start-up, and encourages students to learn and retain the concepts in order to be more successful on their homework. The learning path guides students to first take advantage of the learning resources at their disposal, including videos and new applets, before directing them to their assignments, which are premade. The MyLab Math course is set up to help instructors get the most out of their course, but all assignments are able to be tailored to instructors' needs.



Robust Video Program

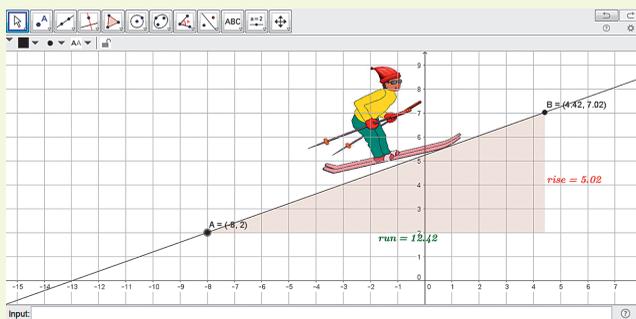
The wealth of video resources in the MyLab Math course give students just-in-time help at home, in the lab, or on the go. Video resources include:

- Author-in-Action videos featuring author Mike Sullivan's actual classroom lecture
- Example-level solution clips
- Chapter Test Prep videos

New QR codes located throughout the textbook give students instant, easy access to all the videos.

NEW! Applets

New applets developed by the authors let students interact with the math in a visual, tangible way. These animations allow students to explore and manipulate the mathematical concepts, leading to long-lasting understanding, and corresponding exercises in MyLab Math make them truly assignable.



Guided Exercises

In addition to MyLab Math's hallmark interactive exercises, Guided Exercises walk students through each step of the problem-solving process, giving them a guided, step-by-step learning experience. These are based on the "How To" exercises from the text and were written by the authors.

Resources for Success

Instructor Resources

Annotated Instructor's Edition

ISBN 10: 0134719522 **ISBN 13:** 9780134719528

The AIE provides annotations for instructors, including answers and teaching tips.

The following resources can be downloaded from www.pearsonhighered.com or in MyLab Math.*

Instructor Solutions Manual

This manual provides worked-out solutions to all exercises in the text.

Instructor's Resource Manual

This manual includes resources designed to help both new and experienced instructors with course preparation and classroom management. The manual includes mini-lectures for each section of the text, chapter by chapter teaching tips, sample syllabi, and more.

PowerPoints

These slides present key concepts and definitions from the text.

TestGen

TestGen® (www.pearsoned.com/testgen) enables instructors to build, edit, print, and administer tests using a computerized bank of questions developed to cover all the objectives of the text.

Student Resources

Author in Action videos

Available in MyLab Math, these videos feature each objective presented by the authors with detailed explanations and examples.

Student Solutions Manual

ISBN 10: 0134719557 **ISBN 13:** 9780134719559

This manual contains complete worked solutions to the odd-numbered problems in the end-of-section exercise sets and all of the Quick Checks and end-of-chapter exercises.

Video Notebook

ISBN 10: 0134719603 **ISBN 13:** 9780134719603

The Video Notebook is an unbound, three-hole-punched workbook/note-taking guide that students use in conjunction with the Sullivan/Struve/Mazzarella "Author in Action" videos. The notebook helps them develop organized notes as they work along with the videos.

- A Video Guide for each section is organized by learning objective. Typically, there is one Author in Action video per objective, and students are asked to write down important definitions and procedures and work through key examples as they watch the video.
- The clean layout and ample space let students write out full definitions and show all work for the examples.
- The unbound, loose-leaf format allows students to insert additional notes from class and/or homework—so they can build a course notebook and good study skills for future classes!

*To access our Instructor Resource Center (IRC), please go to <http://www.pearsonhighered.com/pearsonhigheredus/educator/catalog/index.page?null> and follow the prompts. Once approved for online access, you will receive an email containing instructions on how to redeem your code and create your login name and password.

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 John Bialas, *Joliet Junior College*
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 Tim Britt, *Jackson State Community College*
 Linda Britton, *Oakland Community College*
 Holly J. Broesamle, *Oakland Community College*
 Beverly Broomell, *Suffolk Community College*
 Joanne Brunner, *Joliet Junior College*
 Hien Bui, *Hillsborough Community College—Dale Mabry*
 Connie Buller, *Metropolitan Community College*
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 Marc Campbell, *Daytona Beach Community College*
 Elena Catoiu, *Joliet Junior College*
 Nancy Chell, *Anne Arundel Community College*

John F. Close, *Salt Lake Community College*
 Bobbi Cook, *Indian River Community College*
 Carlos Corona, *San Antonio College*
 Faye Dang, *Joliet Junior College*
 Shirley Davis, *South Plains College*
 Vivian Dennis-Monzingo, *Eastfield College*
 Alvio Dominguez, *Miami Dade College—Wolfson*
 Karen Driskell, *South Plains College*
 Thomas Drucker, *University of Wisconsin—Whitewater*
 Brenda Dugas, *McNeese State University*
 Doug Dunbar, *Okaloosa-Walton Junior College*
 Laura Dyer, *Southwestern Illinois State University*
 Bill Echols, *Houston Community College—Northwest*
 Erica Egizio, *Lewis University*
 Laura Egner, *Joliet Junior College*
 Jason Eltrevoog, *Joliet Junior College*
 Nancy Eschen, *Florida College Jacksonville*
 Mike Everett, *Santa Ana College*
 Phil Everett, *Ohio State University*
 Scott Fallstrom, *Shoreline Community College*
 Betsy Farber, *Bucks County Community College*
 Fitzroy Farquharson, *Valencia Community College—West*
 Jacqueline Fowler, *South Plains College*
 Dorothy French, *Community College of Philadelphia*
 Randy Gallaher, *Lewis and Clark College*
 Sanford Geraci, *Broward Community College*
 Donna Gerken, *Miami Dade College—Kendall*
 Adrienne Goldstein, *Miami Dade College—Kendall*

Marion Graziano, *Montgomery County Community College*
 Susan Grody, *Broward College*
 Tom Grogan, *Cincinnati State University*
 Barbara Grover, *Salt Lake Community College*
 Shawna Haider, *Salt Lake Community College*
 Margaret Harris, *Milwaukee Area Technical College*
 Sheyleah V. Harris-Plant, *South Plains College*
 Teresa Hasenauer, *Indian River College*
 Margy Heddens, *Highland Community College*
 Mary Henderson, *Okaloosa-Walton Junior College*
 Celeste Hernandez, *Richland College*
 Paul Hernandez, *Palo Alto College*
 Pete Herrera, *Southwestern College*
 Bob Hervey, *Hillsborough College—Dale Mabry*
 Teresa Hodge, *Broward College*
 Sandee House, *Georgia Perimeter College*
 Becky Hubiak, *Tidewater Community College—Virginia Beach*
 Michelle Hurn, *Highland Community College*
 Sally Jackman, *Richland College*
 John Jarvis, *Utah Valley State College*
 Nancy Johnson, *Broward College*
 Steven Kahn, *Anne Arundel Community College*
 Linda Kass, *Bergen Community College*
 Donna Katula, *Joliet Junior College*
 Mohammed Kazemi, *University of North Carolina—Charlotte*
 Doreen Kelly, *Mesa Community College*
 Mike Kirby, *Tidewater Community College—Virginia Beach*
 Keith Kuchar, *College of Dupage*
 Carla Kulinsky, *Salt Lake Community College*

Julie Labbiento, *Leigh Carbon Community College*
 Kathy Lavelle, *Westchester Community College*
 Deanna Li, *North Seattle Community College*
 Heidi Lyne, *Joliet Junior College*
 Brian Macon, *Valencia Community College—West*
 Lynn Marecek, *Santa Ana College*
 Jim Matovina, *Community College of Southern Nevada*
 Jean McArthur, *Joliet Junior College*
 Michael McComas, *Marshall University*
 Mikal McDowell, *Cedar Valley College*
 Lee McEwen, *Ohio State University*
 David McGuire, *Joliet Junior College*
 Angela McNulty, *Joliet Junior College*
 Debbie McQueen, *Fullerton College*
 Judy Meckley, *Joliet Junior College*
 Lynette Meslinsky, *Erie Community College—City Campus*
 Kausha Miller, *Lexington Community College*
 Chris Mizell, *Okaloosa Walton Junior College*
 Jim Moore, *Madison Area Technical College*
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 Elizabeth Morrison, *Valencia College—West*
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 Faith Peters, *Miami Dade College—Wolfson*
 Dr. Eugenia Peterson, *Richard J. Daley College*
 Jean Pierre-Victor, *Richard J. Daley College*
 Philip Pina, *Florida Atlantic University*
 Carol Poos, *Southwestern Illinois University*
 Elise Price, *Tarrant County College*
 R.B. Pruitt, *South Plains College*
 William Radulovich, *Florida College Jacksonville*
 Pavlov Rameau, *Miami Dade College—Wolfson*
 David Ray, *University of Tennessee—Martin*
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 David Ruffato, *Joliet Junior College*
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 Togba Sapolucia, *Houston Community College*
 Julia Shew, *Columbus State Community College*
 Doug Smith, *Tarrant County College*
 Catherine J.W. Snyder, *Alfred State College*
 Gisela Spieler-Persad, *Rio Hondo College*
 Raju Sriram, *Okaloosa-Walton Junior College*
 Patrick Stevens, *Joliet Junior College*
 Bryan Stewart, *Tarrant County College*
 Jennifer Strehler, *Oakton Community College*
 Elizabeth Suco, *Miami Dade College—Wolfson*
 Katalin Szucs, *East Carolina University*
 KD Taylor, *Utah Valley State College*
 Mary Ann Teel, *University of North Texas*
 Suzanne Topp, *Salt Lake Community College*
 Suzanne Trabucco, *Nassau Community College*
 Jo Tucker, *Tarrant County College*
 Bob Tuskey, *Joliet Junior College*
 Mary Vachon, *San Joaquin Delta College*
 Carol Walker, *Hinds Community College*
 Kim Ward, *Eastern Connecticut State University*
 Richard Watkins, *Tidewater Community College*
 Natalie Weaver, *Daytona Beach College*
 Carol White, *Highland Community College*
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