Precalculus Enhanced With Graphing Utilities (3rd Edition)

By Michael Sullivan

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The Sullivan Enhanced with Graphing Utilities series fully integrates the graphing calculator. These widely adopted books are known for their precise careful presentation of mathematics. This precision permeates the book and is particularly evident in the examples, pedagogy and exercises. This book includes coverage a wide range of topics including functions and their graphs, polynomial and rational functions, exponential and logarithmic functions, trigonometric functions and their applications, analytic geometry, systems of equations and inequalities, probability, and an introduction to calculus. For anyone who needs to brush up on everyday or business-related mathematics.

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Editorial Review

TO THE INSTRUCTOR

As professors at both an urban public university and a community college, Michael Sullivan and Michael Sullivan, III are aware of the varied needs of Precalculus students. As a teacher, and as an author of precalculus, engineering calculus, finite mathematics, and business calculus texts, Michael understands what students must know if they are to be focused and successful in upper level mathematics courses. As a father of four, including the co-author, he also understands the realities of college life. His co-author and son, Michael III, believes passionately in the value of technology as a tool for 'learning that enhances understanding without sacrificing important skills.

Precalculus texts too often are simply condensed versions of algebra and trigonometry texts. College algebra and algebra and trigonometry students are different from precalculus students and their texts should reflect this difference. For example, Chapter 13, A Preview of Calculus: the Limit, Derivative, and Integral of a Function, not only demonstrates to students how the material of Precalculus applies to calculus, but also moves the student into calculus. Throughout this text there are references to calculus, shown by a calculus icon to further motivate and remind the student that this mathematics will be used later. There are other, more subtle, aspects of this text that prepare the student for calculus. For example, many applications that are traditional to calculus have been inserted as algebra and trigonometry problems. These examples and exercises are designed to emphasize the role of algebra and trigonometry in calculus and to encourage and motivate students in Precalculus to further insure their success in calculus.

Together, Michael and Michael, III have taken great pains to ensure that this text contains solid, student-friendly examples and exercises, as well as a clear, seamless writing style. Please share with them your experiences teaching from this text.

The Third Edition

The Third Edition builds upon a strong foundation by integrating new features and techniques that further enhance student interest and involvement. The elements of previous editions that have proved successful remain, while many changes, some obvious, others subtle, have been made. One important benefit of authoring a successful series is the broad-based feedback upon which improvements and additions are ultimately based. Virtually every change to this edition is the result of thoughtful comments and suggestions from colleagues and students who used previous editions. We are sincerely grateful for this feedback and have tried to make changes that improve the usefulness of the text for both instructors and students.

New to the Third Edition

Preparing for This Section
Most sections now open with a referenced list (by section and page number) of key items to review in preparation for the section ahead. This provides a just-in-time review for students.

Concepts and Vocabulary

At the end of every section, there is a short list of Fill-in-the-Blank and True/False items that test concepts and vocabulary in a short answer format. Several quick-answer questions are also included.

Cumulative Reviews

At the end of Chapters 2-12, exercises are provided that require skills learned in the earlier chapters. These cumulative reviews serve to continually rein force the important concepts of Precalculus. They also make it easier for the student to prepare for a comprehensive final examination.

Content

• The formula for the area of a sector and related exercises are now part of --Section 5.1 Angles and Their Measure.

• Combining Waves is a new subsection in Section 7.5 Simple Harmonic Motion; Damped Motion; Combining Waves.

• The Cross Product is a new section in Chapter 8 Polar Coordinates; Vectors.

• The Area Problem; the Integral is a new section in Chapter 13 A Preview of Calculus: the Limit, Derivative, and Integral of a Function

• New Chapter Projects have been added that discuss topics of current interest.

Organization

• Scatter diagrams, formerly part of Section 1.1, now appear in Section 2.2 Linear Functions and Models. This change positions the content where it is being used.

• Setting up Equations; Applications, formerly Section 1.4, now is part of the Appendix. This change allows those who wish to finish Chapter 1 more quickly, the opportunity to do so. If you wish, it can be covered anytime after Section 1.4.

• Circles, formerly Section 1.7, now is part of Section 1.3.

• The discussion on Rational Functions, formerly Section 3.7, now appears earlier in Chapter 3 as two sections. This division makes it possible to teach the sections in one period each.

• Complex Numbers; Quadratic Equations with a Negative Discriminant, formerly Section 3.5, now is part of the Appendix. This change now makes the material of Chapter 3 more consistent in level of difficulty. For those who wish to cover quadratic equations with a negative discriminant early, this section may be covered anytime after Section 1.4. Finally, this material can be used as a just-in-time review of complex numbers before Section 3.8 Complex Zeros; Fundamental Theorem of Algebra and before Section 8.3 The Complex Plane; DeMoivre's Theorem.

• Section 4.3, Exponential Functions, now contains a subsection on exponential equations; Section 4.4, Logarithmic Functions, now contains a subsection on logarithmic equations.

• The discussion on Right Triangle Trigonometry, formerly Section 5.4, has been relocated to Chapter 7, Applications of Trigonometry. This change makes the material of Chapter 5 more consistent in level of difficulty. For those who wish to cover this material earlier, this section can be covered anytime after Section 5.3.

• Graphs of the Trigonometric Functions and Sinusoidal Graphs; Sinusoidal Curve Fitting, formerly Sections 5.5 and 5.6, now is covered in three sees dons, 5.4, 5.5, and 5.6. This change makes it possible to teach the section in one period each.

• The Inverse Trigonometric Functions, formerly Section 6.5, now is covered in two sections at the beginning of the chapter. This change makes it possible to teach the sections in one period each. It also places the content closer to the discussion of the trigonometric functions and their graphs.

Features in the 3rd Edition

• Section ***OBJECTIVES*** appear in a numbered list to begin each section. NOW WORK PROBLEM XX. appears after a concept has been introduced. This directs the student to a problem in the exercises that tests

the concept, insuring that the concept has been mastered before moving on. The Now Work problems are identified in the exercises using orange, numbers and a pencil icon.

- References to Calculus are identified by a calculus icon.
- Discussion, Writing, and Research problems appear in most exercise; sets, identified by an icon and red numbers. These problems provide a basis for class discussion, writing projects, and library projects.
- Historical Perspectives, sometimes with exercises, are presented in context,, and provide interesting anecdotal information.
- Varied applications and real-world, sourced data are abundant in Examples and Exercises.
- Concepts and Vocabulary, a short list of Fill-in-the-Blank, True/False, and open-ended questions that test concepts and vocabulary in a quick-answer format, are given at the end of every section.
- An extensive Chapter Review provides a list of important formulas and key definitions and theorems. The objectives of the chapter are listed by section, with page references and review exercises that relate to the objective. The authors' suggestions for a practice test are indicated by a blue number in the review exercise set.
- Chapter Projects that are relevant and current, many based on newspaper articles, appear at the end of each chapter. These can serve as the basis for collaborative learning experiences.
- Cumulative Reviews appear at the end of Chapters 2-12. These problem sets serve to continually reinforce skills from earlier chapters.

Using the 3ʳᵈ Edition Effectively and Efficiently with Your Syllabus

To meet the varied needs of diverse syllabi, this book contains more content than expected in a precalculus course. The illustration shows the dependencies of chapters on each other.

As the chart indicates, this book has been organized with flexibility of use in mind. Even within a given chapter, certain sections are optional and can be skipped without fear of future problems.

Chapter 1. Graphs
This chapter is a briefer version of the former Chapter 1. A quick coverage of this chapter, which is mainly review material, will enable you to get to Chapter 2 Functions and their Graphs earlier.

Chapter 2. Functions and Their Graphs
Perhaps the most important chapter. Section 2.7 is optional.

Chapter 3. Polynomial and Rational Functions
Topic selection is dependent on your syllabus.

Chapter 4. Exponential and Logarithmic Functions
Sections 4.1-4.5 follow in sequence. Sections 4.6, 4.7, and 4.8 are optional; each of these requires Section 4.3.

Chapter 5. Trigonometric Functions
The sections follow in sequence. Section 5.6 is optional.

Chapter 6. Analytic Trigonometry
The sections follow in sequence. Sections 6.2, 6.6, and 6.8 may be skipped in a brief course.

Chapter 7. Applications of Trigonometry
The sections follow in sequence. Sections 7.4 and 7.5 are optional.

Chapter 8. Polar Coordinates; Vectors

Sections 8.1-8.3 and Sections 8.4-8.7 are independent and may be covered separately.

Chapter 9. Analytic Geometry
Sections 9.1-9.4 follow in sequence. Sections 9.5,9.6, and 9.7 are independent of each other, but do depend on sections 9.1-9.4.

Chapter 10. Systems of Equations and Inequalities
Sections 10.1-10.2 follow in sequence; Sections 10.3-10.8 require Sections 10.1-10.2, but may be covered in any order. Section 10.7 also requires Sections 9.1-9.4. Section 10.9 requires Section 10.8.

Chapter 11. Sequences; Induction; The Binomial Theorem
There are three independent parts: Sections 11.1-11.3; Section 11.4; and Section 11.5.

Chapter 12. Counting and Probability
Sections 12.1-12.3 follow in sequence; Section 12.4 is optional.

Chapter 13. A Preview of Calculus: the Limit, Derivative, and Integral of a Function
If time permits, coverage of this chapter will give your students a beneficial head-start in calculus. The sections follow in sequence.

Appendix Review
Sections A.1-A.6 and Section A.9 consist of review material, which can be used as the first part of a course in Precalculus or as a just-in-time review. Specific references to this material occur throughout the text to assist in the review process. Coverage of Sections A.7 and A.8 depends on your syllabus.

Users Review

From reader reviews:

Pat Billings:

The book Precalculus Enhanced With Graphing Utilities (3rd Edition) give you a sense of feeling enjoy for your spare time. You may use to make your capable more increase. Book can for being your best friend when you getting anxiety or having big problem with the subject. If you can make examining a book Precalculus Enhanced With Graphing Utilities (3rd Edition) to get your habit, you can get more advantages, like add your current capable, increase your knowledge about several or all subjects. You could know everything if you like available and read a reserve Precalculus Enhanced With Graphing Utilities (3rd Edition). Kinds of book are a lot of. It means that, science publication or encyclopedia or others. So , how do you think about this e-book?

Tracy Gardiner:

Do you among people who can't read gratifying if the sentence chained from the straightway, hold on guys this particular aren't like that. This Precalculus Enhanced With Graphing Utilities (3rd Edition) book is readable simply by you who hate those straight word style. You will find the data here are arrange for enjoyable examining experience without leaving even decrease the knowledge that want to deliver to you. The writer regarding Precalculus Enhanced With Graphing Utilities (3rd Edition) content conveys thinking easily to understand by many people. The printed and e-book are not different in the articles but it just different as it. So , do you continue to thinking Precalculus Enhanced With Graphing Utilities (3rd Edition)

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Reading a reserve tends to be new life style in this era globalization. With studying you can get a lot of information that can give you benefit in your life. Having book everyone in this world can share their idea. Books can also inspire a lot of people. A lot of author can inspire their reader with their story or even their experience. Not only the storyline that share in the guides. But also they write about the knowledge about something that you need illustration. How to get the good score toefl, or how to teach your young ones, there are many kinds of book that you can get now. The authors these days always try to improve their talent in writing, they also doing some research before they write with their book. One of them is this Precalculus Enhanced With Graphing Utilities (3rd Edition).

Sheila Messina:

The book Precalculus Enhanced With Graphing Utilities (3rd Edition) has a lot of information on it. So when you read this book you can get a lot of advantage. The book was written by the very famous author. This articles author makes some research prior to write this book. This specific book very easy to read you may get the point easily after perusing this book.

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