

Preparation for Calculus

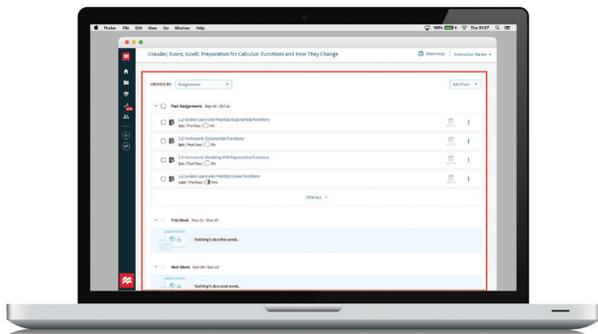
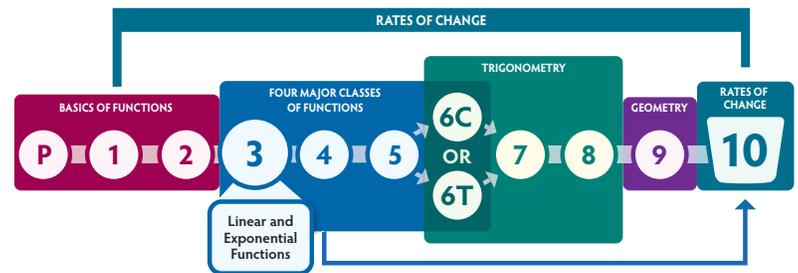
Functions and How They Change

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Backwards-designed to help students approach precalculus with a calculus mindset

The authors of *Preparation for Calculus* designed this project to address content gaps and weaknesses common to new calculus students. Even immediately after taking a precalculus course, their students lacked critical skills, so the authors decided to revamp their approach to teaching precalculus using backwards design: working in reverse from the knowledge that students should possess when entering calculus, rather than simply building off of prior developmental math courses. They started by identifying the skills that students truly need to succeed in calculus and built a book and technology program that meets those needs, but does not overwhelm students with extraneous information.

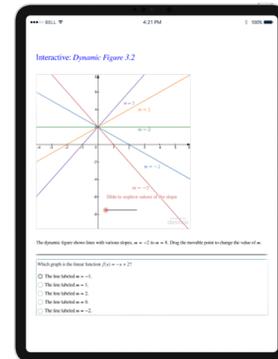
You'll notice that although precalculus materials typically take either the "unit circle" approach or the "right triangle" approach, our authors allow instructors to choose the approach that is right for their students. The capstone chapter, Chapter 10, acts as a launch point into calculus by showing students how all the concepts come together.



Integrated Text and Digital Resources

Macmillan's online platform, Achieve, supports students and instructors by providing flexible resources in an easy-to-use, accessible platform. Tutorial-style assessment mirrors the pedagogy in the text by providing warning messages, detailed error-specific feedback, and fully worked solutions to coach students toward a deeper understanding of the content. Our Math Assessment Engine, powered by the computer algebra system SymPy, accepts every equivalent answer and features an intuitive math palette of commonly used symbols and figures.

Multimedia resources in Achieve bring the content of the book to life; animated graphs, interactive figures, and narrated problem-solving videos help students visualize precalculus and deepen their conceptual understanding. Resources in Achieve are curated by our authors and our team of content experts, and are fully assignable and auto-graded.



Early and Intuitive Introduction to the Dynamic Properties of Functions

In precalculus, students traditionally think about functions in a static way and then are overwhelmed by dynamic properties of functions, but the authors believe that if the concepts are introduced early and intuitively, using examples from their daily lives, students will be better able to grasp these ideas. Plentiful worked examples ensure that students have the support they need, and *Try It Yourself* features allow students to bolster their often inadequate calculation skills by practicing on their own in a low-stakes environment. The dynamic presentation of functions, limits, and rates of change is woven throughout the text reinforcing a key component needed for success in future calculus courses and fostering an understanding of more sophisticated concepts.

TABLE OF CONTENTS

Precalculus

Functions and how they change
Contents

P The Coordinate Plane and Inequalities

- P.1The coordinate plane: lines and circles
- P.2Linear inequalities
- P.3Nonlinear inequalities

1 Functions and How They Change

- 1.1The basics of functions
- 1.2Average rates of change
- 1.3Graphs and rates of change
- 1.4Limits and end behavior of graphs

2 Operations on Functions and Graphs

- 2.1New functions from old
- 2.2Inverse functions
- 2.3Transformations of graphs

3 Linear and Exponential Functions

- 3.1Linear functions: constant rate of change
- 3.2Exponential functions: constant proportional change
- 3.3Modeling with exponential functions

4 Logarithms

- 4.1Logarithms: definition and fundamental properties
- 4.2Laws of logarithms
- 4.3Solving exponential and logarithmic equations

5 Polynomials and Rational Functions

- 5.1Quadratic functions
- 5.2Long division and the factor theorem
- 5.3Zeros of higher-degree polynomials
- 5.4Graphs of polynomials
- 5.5Rational functions

6c Introduction to Trigonometry: A Unit Circle Approach

- 6C.1Angles
- 6C.2The unit circle
- 6C.3The trigonometric functions
- 6C.4Right triangle trigonometry

6t Introduction to Trigonometry: A Right Triangle Approach

- 6T.1Angles
- 6T.2Definition of the trigonometric functions using right triangles
- 6T.3Analysis of right triangles
- 6T.4Extending the trigonometric functions: the unit circle

7 Graphs and Periodicity of Trigonometric Functions

- 7.1Graphs of the sine and cosine
- 7.2Graphs of other trigonometric functions
- ON7.3Modeling with periodic functions

8 Algebra of Trigonometric Functions

- 8.1Trigonometric identities
- 8.2Sum and difference formulas
- 8.3Double-angle and half-angle formulas
- 8.4Inverse trigonometric functions
- 8.5Solving trigonometric equations

9 Topics in Geometry

- 9.1Law of cosines
- 9.2Law of sines
- 9.3Vectors
- 9.4Vectors in the plane and in three dimensions
- ON9.5Complex numbers and de Moivre's theorem
- ON9.6Polar coordinates
- ON9.7Parametric equations

10 A Qualitative Exploration of Rates of Change

- 10.1An introduction to the rate of change as a function
- 10.2Change equations: linear and exponential functions
- 10.3Graphical solutions of change equations

Appendices

- A-1Using technology to solve equations
- A-2Complex numbers
- A-3The complex exponential function
- A-4Derivation of the monthly payment formula
- A-5Circles and the law of sines
- A-6Matrix inverses
- A-7Induction
- A-8Probability
- A-9Vector equations of lines
- A-10Cofactor definition of determinants
Cofactor expansion
Determinants and row operations

MATERIALS AVAILABLE ONLINE

ON0 Algebra Review

- ON0.1Numbers, products, and factors
- ON0.2Absolute value, roots, and radicals
- ON0.3Algebraic fractions
- ON0.4Solving equations
Chapter Summary

ON11 Systems of Equations and Matrices

- ON11.1Systems of linear equations
- ON11.2Augmented matrices
- ON11.3Matrix algebra
- ON11.4Determinants
- ON11.5Systems of nonlinear equations
- ON11.6Systems of inequalities
- ON11.7The method of partial fractions
Chapter Summary

ON12 Analytic Geometry of Conic Sections

- 12.1Circles and ellipses
- 12.2Parabolas and hyperbolas
- 12.3Polar and parametric equations of conic sections
- 12.4Rotations of conic sections
Chapter Summary

ON13 Sequences, Sums, and the Binomial Theorem

- 13.1Sequences
- 13.2Sums
- 13.3Counting and the binomial theorem
Chapter Summary