

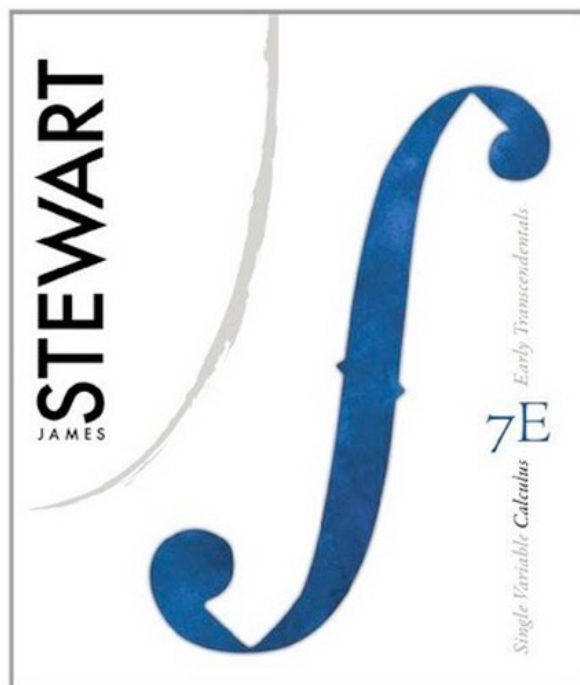
# Textbook Information

Math 207 GH– Calculus 1

Fall 2016

The class's textbook policy is as follows. **Students must have a textbook but it does NOT have to be the official textbook designated for this course.** This policy is intended to lower textbook costs. Usually students can purchase a textbook for the course under \$40.

The textbook for this course is the 7th edition of *Calculus, Early Transcendentals* by James Stewart (Books/Cole, 2012; ISBN Number: 978-0-538-49790-9 or 978-0-8400-5885-0). Students are welcome to use any previous edition at a much lower cost. Students also may rent or purchase e-versions of a calculus book



Students also may use other calculus books. However, it is essential that students use a text that is labeled **early transcendentals**. These include any early transcendental version (any edition) of calculus textbooks written by:

Soo T. Tan  
George B Thomas  
Ron Larson

Jerrold E. Marsden  
Deborah Hughes-Hallett  
William Briggs

Those students who intend to pursue mathematics as their major, they will see calculus again, later in their undergraduate studies. That second glimpse into calculus will include much more rigor and in-depth knowledge. For that adventure, Michael Spivak's *Calculus* text is highly recommended.

# Topics In the Textbook

Preface  
To the Student  
Diagnostic Tests

## Chapter 1 – Functions and Models

1.1 Four Ways to Represent a Function  
1.2 Mathematical Models: A Catalog of Essential Functions  
1.3 New Functions from Old Functions  
1.4 Graphing Calculators and Computers  
1.5 Exponential Functions  
1.6 Inverse Functions and Logarithms  
Review  
Problems Plus

## Chapter 2 – Limits and Derivatives

2.1 The Tangent and Velocity Problems  
2.2 The Limit of a Function  
2.3 Calculating Limits Using the Limit Laws  
2.4 The Precise Definition of a Limit  
2.5 Continuity  
2.6 Limits at Infinity; Horizontal Asymptotes  
2.7 Derivatives and Rates of Change  
2.8 The Derivative as a Function  
Review  
Problems Plus

## Chapter 3 – Differentiation Rules

3.1 Derivatives of Polynomials and Exponential Functions  
3.2 The Product and Quotient Rules  
3.3 Derivatives of Trigonometric Functions  
3.4 The Chain Rule  
3.5 Implicit Differentiation  
3.6 Derivatives of Logarithmic Functions  
3.7 Rates of Change in the Natural and Social Sciences  
3.8 Exponential Growth and Decay  
3.9 Related Rates  
3.10 Linear Approximations and Differentials  
3.11 Hyperbolic Functions  
Review  
Problems Plus

## Chapter 4 – Applications of Differentiation

4.1 Maximum and Minimum Values  
4.2 The Mean Value Theorem  
4.3 How Derivatives Affect the Shape of a Graph  
4.4 Indeterminate Forms and l'Hospital's Rule  
4.5 Summary of Curve Sketching  
4.6 Graphing with Calculus and Calculators  
4.7 Optimization Problems  
4.8 Newton's Method  
4.9 Antiderivatives  
Review  
Problems Plus

## Chapter 5 – Integrals

5.1 Areas and Distances  
5.2 The Definite Integral  
5.3 The Fundamental Theorem of Calculus  
5.4 Indefinite Integrals and the Net Change Theorem  
5.5 The Substitution Rule  
Review  
Problems Plus

## Chapter 6 – Applications of Integration

6.1 Areas Between Curves  
6.2 Volumes  
6.3 Volumes by Cylindrical Shells  
6.4 Work  
6.5 Average Value of a Function  
Review  
Problems Plus

## Chapter 7 – Techniques of Integration

7.1 Integration by Parts  
7.2 Trigonometric Integrals  
7.3 Trigonometric Substitution  
7.4 Integration of Rational Functions by Partial Fractions  
7.5 Strategy for Integration  
7.6 Integration Using Tables and Computer Algebra Systems  
7.7 Approximate Integration  
7.8 Improper Integrals  
Review  
Problems Plus

## Chapter 8 – Further Applications of Integration

8.1 Arc Length  
8.2 Area of a Surface of Revolution  
8.3 Applications to Physics and Engineering  
8.4 Applications to Economics and Biology  
8.5 Probability  
Review  
Problems Plus

## Chapter 9 – Differential Equations

9.1 Modeling with Differential Equations  
9.2 Direction Fields and Euler's Method  
9.3 Separable Equations  
9.4 Models for Population Growth  
9.5 Linear Equations  
9.6 Predator-Prey Systems  
Review  
Problems Plus

## **Chapter 10 – Parametric Equations and Polar Coordinates**

- 10.1 Curves Defined by Parametric Equations
- 10.2 Calculus with Parametric Curves
- 10.3 Polar Coordinates
- 10.4 Areas and Lengths in Polar Coordinates
- 10.5 Conic Sections
- 10.6 Conic Sections in Polar Coordinates
  - Review
  - Problems Plus

## **Chapter 11 – Infinite Sequences and Series**

- 11.1 Sequences
- 11.2 Series
- 11.3 The Integral Test and Estimates of Sums
- 11.4 The Comparison Tests
- 11.5 Alternating Series
- 11.6 Absolute Convergence and the Ratio and Root Tests
- 11.7 Strategy for Testing Series
- 11.8 Power Series
- 11.9 Representations of Functions as Power Series
- 11.10 Taylor and Maclaurin Series
- 11.11 Applications of Taylor Polynomials
  - Review
  - Problems Plus

## **Chapter 12 – Vectors and the Geometry of Space**

- 12.1 Three-Dimensional Coordinate Systems
- 12.2 Vectors
- 12.3 The Dot Product
- 12.4 The Cross Product
- 12.5 Equations of Lines and Planes
- 12.6 Cylinders and Quadric Surfaces
  - Review
  - Problems Plus

## **Chapter 13 – Vector Functions**

- 13.1 Vector Functions and Space Curves
- 13.2 Derivatives and Integrals of Vector Functions
- 13.3 Arc Length and Curvature
- 13.4 Motion in Space: Velocity and Acceleration
  - Review
  - Problems Plus

## **Chapter 14 – Partial Derivatives**

- 14.1 Functions of Several Variables
- 14.2 Limits and Continuity
- 14.3 Partial Derivatives
- 14.4 Tangent Planes and Linear Approximations
- 14.5 The Chain Rule
- 14.6 Directional Derivatives and the Gradient Vector
- 14.7 Maximum and Minimum Values
- 14.8 Lagrange Multipliers
  - Review
  - Problems Plus

## **Chapter 15 – Multiple Integrals**

- 15.1 Double Integrals over Rectangles
- 15.2 Iterated Integrals
- 15.3 Double Integrals over General Regions
- 15.4 Double Integrals in Polar Coordinates
- 15.5 Applications of Double Integrals
- 15.6 Surface Area
- 15.7 Triple Integrals
- 15.8 Triple Integrals in Cylindrical Coordinates
- 15.9 Triple Integrals in Spherical Coordinates
- 15.10 Change of Variables in Multiple Integrals
  - Review
  - Problems Plus

## **Chapter 16 – Vector Calculus**

- 16.1 Vector Fields
- 16.2 Line Integrals
- 16.3 The Fundamental Theorem for Line Integrals
- 16.4 Green's Theorem
- 16.5 Curl and Divergence
- 16.6 Parametric Surfaces and Their Areas
- 16.7 Surface Integrals
- 16.8 Stokes' Theorem
- 16.9 The Divergence Theorem
- 16.10 Summary
  - Review
  - Problems Plus

## **Chapter 17 – Second-Order Differential Equations**

- 17.1 Second-Order Linear Equations
- 17.2 Nonhomogeneous Linear Equations
- 17.3 Applications of Second-Order Differential Equations
- 17.4 Series Solutions
  - Review

## **Appendixes**

- A Numbers, Inequalities, and Absolute Values
- B Coordinate Geometry and Lines
- C Graphs of Second-Degree Equations
- D Trigonometry
- E Sigma Notation
- F Proofs of Theorems
- G The Logarithm Defined as an Integral
- H Complex Numbers
- I Answers to Odd-Numbered Exercises

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