HOPATCONG BOROUGH SCHOOLS

MATHEMATICS

CALCULUS CP
GRADES 11,12

JUNE, 2007

Calculus CP
2007

COURSE DESCRIPTION: This Calculus course is designed to give students a comprehensive overview of the first of two semesters of college level Calculus. Included in this course are an in-depth review of Analytic Geometry and of algebraic, exponential and trigonometric functions. The concepts of derivative and anti-derivative are introduced along with formulas for products, quotients and powers. Students will use the derivative to find the slope of a function at any value for the variable and to determine the instantaneous rate of change of an object in motion. The concepts of derivative and integral will allow students to determine values of extrema, intervals of increasing and decreasing values of functions, intervals of positive and negative concavity of functions, related rates, average rates of change, velocity, acceleration, average value of a function, area and volume. Exponential growth and its applications of the derivative and integral are also investigated.
As the course progresses, students will be expected to revamp many of the previous mathematical concepts they have learned into the concept of approaching the solution of a problem by the use of the limit process.

CORE CURRICULUM CONTENT STANDARDS

STANDARD 4.3 (PATTERNS AND ALGEBRA) ALL STUDENTS WILL REPRESENT AND ANALYZE RELATIONSHIPS AMONG VARIABLE QUANTITIES AND SOLVE PROBLEMS INVOLVING PATTERNS FUNCTIONS AND ALGEBRAIC CONCEPTS ANND PROCESSES.

Descriptive Statement: Algebra is a symbolic language used to express mathematical relationships. Students need to understand how quantities are related to one another, and how algebra can be used to concisely express and analyze those relationships.
Patterns. Algebra provides the language through which we communicate the patterns in mathematics. From the earliest age, students should be encouraged to investigate the patterns
that they find in numbers, shapes, and expressions, and, by doing so, to make mathematical
discoveries. They should have opportunities to analyze, extend, and create a variety of patterns
and to use pattern-based thinking to understand and represent mathematical and other real-world
phenomena.
Functions and Relationships. The function concept is one of the most fundamental unifying ideas of modern mathematics. Students begin their study of functions in the primary
grades, as they observe and study patterns. As students grow and their ability to abstract matures,

students form rules, display information in a table or chart, and write equations which express
the relationships they have observed. In high school, they use the more formal language of algebra to describe these relationships.

Modeling. Algebra is used to model real situations and answer questions about them. This use of algebra requires the ability to represent data in tables, pictures, graphs, equations or
inequalities, and rules. Modeling ranges from writing simple number sentences to help solve
story problems in the primary grades to using functions to describe the relationship between two
variables, such as the height of a pitched ball over time. Modeling also includes some of the
conceptual building blocks of calculus, such as how quantities change over time and what happens in the long run (limits).

Procedures. Techniques for manipulating algebraic expressions – procedures – remain important, especially for students who may continue their study of mathematics in a calculus
program. Utilization of algebraic procedures includes understanding and applying properties of
numbers and operations, using symbols and variables appropriately, working with expressions,
equations, and inequalities, and solving equations and inequalities.

Algebra is a gatekeeper for the future study of mathematics, science, the social sciences, business, and a host of other areas. In the past, algebra has served as a filter, screening people
out of these opportunities. For New Jersey to be part of the global society, it is important that
algebra play a major role in a mathematics program that opens the gates for all students.

STANDARD 4.5 (MATHEMATICAL PROCESSES) ALL STUDENTS WILL USE MATHEMATICAL PROCESSES OF PROBLEM SOLVING, COMMUNICATION, CONNECTIONS, REASONING, REPRESENTATIONS, AND TECHNOLOGY TO SOLVE PROBLEMS AND COMMUNICATE MATHEMATICAL IDEAS.

Descriptive Statement: The mathematical processes described here highlight ways of acquiring
and using the content knowledge and skills delineated in the first four mathematics standards.

Problem Solving. Problem posing and problem solving involve examining situations that arise in mathematics and other disciplines and in common experiences, describing

these
situations mathematically, formulating appropriate mathematical questions, and using a variety
of strategies to find solutions. Through problem solving, students experience the power and
usefulness of mathematics. Problem solving is interwoven throughout the grades to provide a
context for learning and applying mathematical ideas.

Communication. Communication of mathematical ideas involves students' sharing their mathematical understandings in oral and written form with their classmates, teachers, and parents. Such communication helps students clarify and solidify their understanding of mathematics and develop confidence in themselves as mathematics learners. It also enables
teachers to better monitor student progress.

Connections. Making connections involves seeing relationships between different topics, and drawing on those relationships in future study. This applies within mathematics, so that
students can translate readily between fractions and decimals, or between algebra and geometry;
to other content areas, so that students understand how mathematics is used in the sciences, the
social sciences, and the arts; and to the everyday world, so that students can connect school
mathematics to daily life.

Reasoning. Mathematical reasoning is the critical skill that enables a student to make use of all other mathematical skills. With the development of mathematical reasoning, students
recognize that mathematics makes sense and can be understood. They learn how to evaluate
situations, select problem-solving strategies, draw logical conclusions, develop and describe
solutions, and recognize how those solutions can be applied.

Representations. Representations refers to the use of physical objects, drawings, charts, graphs, and symbols to represent mathematical concepts and problem situations. By using
various representations, students will be better able to communicate their thinking and solve
problems. Using multiple representations will enrich the problem solver with alternative perspectives on the problem. Historically, people have developed and successfully used manipulatives (concrete representations such as fingers, base ten blocks, geoboards, and algebra
tiles) and other representations (such as coordinate systems) to help them understand and develop mathematics.

Technology. Calculators and computers need to be used along with other mathematical tools by students in both instructional and assessment activities. These tools should be used, not

to replace mental math and paper-and-pencil computational skills, but to enhance understanding
of mathematics and the power to use mathematics. Students should explore both new and familiar concepts with calculators and computers and should also become proficient in using
technology as it is used by adults (e.g., for assistance in solving real-world problems).

Strands and Cumulative Progress Indicators

At each grade level, with respect to content appropriate for that grade level, students will:

A. Problem Solving

1. Learn mathematics through problem solving, inquiry, and discovery.
2. Solve problems that arise in mathematics and in other contexts (cf. workplace readiness standard 8.3).
• Open-ended problems
• Non-routine problems
• Problems with multiple solutions
• Problems that can be solved in several ways
3. Select and apply a variety of appropriate problem-solving strategies (e.g., "try a simpler
problem" or "make a diagram") to solve problems.
4. Pose problems of various types and levels of difficulty.
5. Monitor their progress and reflect on the process of their problem solving activity.

B. Communication

1. Use communication to organize and clarify their mathematical thinking.
• Reading and writing
• Discussion, listening, and questioning
2. Communicate their mathematical thinking coherently and clearly to peers, teachers, and others, both orally and in writing.
3. Analyze and evaluate the mathematical thinking and strategies of others.
4. Use the language of mathematics to express mathematical ideas precisely.

C. Connections

1. Recognize recurring themes across mathematical domains (e.g., patterns in number, algebra, and geometry).
2. Use connections among mathematical ideas to explain concepts (e.g., two linear equations have a unique solution because the lines they represent intersect at a single point).
3. Recognize that mathematics is used in a variety of contexts outside of mathematics.

4. Apply mathematics in practical situations and in other disciplines.
5. Trace the development of mathematical concepts over time and across cultures (cf. world languages and social studies standards).
6. Understand how mathematical ideas interconnect and build on one another to produce a coherent whole.

D. Reasoning

1. Recognize that mathematical facts, procedures, and claims must be justified.
2. Use reasoning to support their mathematical conclusions and problem solutions.
3. Select and use various types of reasoning and methods of proof.
4. Rely on reasoning, rather than answer keys, teachers, or peers, to check the correctness of their problem solutions.
5. Make and investigate mathematical conjectures.
• Counterexamples as a means of disproving conjectures
• Verifying conjectures using informal reasoning or proofs.
6. Evaluate examples of mathematical reasoning and determine whether they are valid.

E. Representations

1. Create and use representations to organize, record, and communicate mathematical ideas.
• Concrete representations (e.g., base-ten blocks or algebra tiles)
• Pictorial representations (e.g., diagrams, charts, or tables)
• Symbolic representations (e.g., a formula)
• Graphical representations (e.g., a line graph)
2. Select, apply, and translate among mathematical representations to solve problems.
3. Use representations to model and interpret physical, social, and mathematical phenomena.

F. Technology

1. Use technology to gather, analyze, and communicate mathematical information.
2. Use computer spreadsheets, software, and graphing utilities to organize and display quantitative information.
3. Use graphing calculators and computer software to investigate properties of functions and their graphs.
4. Use calculators as problem-solving tools (e.g., to explore patterns, to validate solutions).
5. Use computer software to make and verify conjectures about geometric objects.
6. Use computer-based laboratory technology for mathematical applications in the sciences.

TECHNOLOGICAL LITERACY

STANDARD 8.1 (Computer and information literacy). All students will use computer applications to gather and organize information and to solve problems.

CUMULATIVE PROGRESS INDICATORS:

8 Technological Literacy
8.1 All students will use computer applications to gather and organize information and to solve problems.

A. Basic Computer Skills and Tools
1. Create a multi-page document with citations using word processing software in conjunction with other tools that demonstrates the ability to format, edit and print.
2. Create documents including a resume and business letter using professional format.
3. Construct a spreadsheet, enter data, use mathematical or logical functions to manipulate and process data, generate charts and graphs, and interpret the results.
4. Given a database, define fields, input data from multiple records, produce a report using sort and query, and interpret the data.
5. Produce a multimedia project using text, graphics, moving images, and sound.
6. Produce and edit page layouts in different formats using desktop publishing and graphics software.
7. Develop a document or file for inclusion into a website or page.
8. Discuss and/or demonstrate the capability of emerging technologies and software in the creation of documents or files.
9. Merge information from one document to another.

B. Applications of Productivity Tools

Social Aspects

1. Describe the potential and implication of contemporary and emerging computer applications for personal, social lifelong learning, and workplace needs.
2. Exhibit legal and ethical behaviors when using information and technology, and discuss consequences of misuse.
3. Make informed choices among technology systems, resources, and services in a variety of contexts.
4. Use appropriate language when communicating with diverse audiences using computer and information literacy.

Information Access and Research

5. Select and use specialized databases for advanced research to solve real world problems.
6. Identify new technologies ad other organizational tools to use in personal, home, and/or work environments for information retrieval, entry, and presentation.
7. Evaluate information sources for accuracy, relevance, and appropriateness.
8. Compose, send, and organized e-mail messages with and without attachments.

Problem Solving and Decision Making

9. Create and manipulate information independently and/or collaboratively, to solve problems and design and develop products.
10. Identify, diagnose, and suggest solutions for non-functioning technology systems.
11. Identify a problem in a content area and formulate a strategy to solve the problem using brainstorming, flowcharting and appropriate resources.
12. Integrate new information into an existing knowledge base and communicate the results in a project or presentation.

SUGGESTED ACTIVITIES THAT ADDRESS THESE STANDARDS MAY INCLUDE BUT ARE NOT LIMITED TO: (Arrange by standard)

A1. Check integral solutions by differentiating the solution and derivatives of functions by integrating the solution.
A2. Determine the exact rate of change for an object whose velocity function is known by evaluating the derivative.
A3. Use diagrams for each of our problems in application.
A5. Students will display solutions of class and homework on the smart board.
B1. Students will present solutions of class and homework verbally.
B2. Students will sit together and work successfully in committee solution.
B3. This entire course is application to social, medical, business and scientific endeavors.
B4. Through the unified efforts of the teachers of the Hopatcong District our language of mathematics is easily understood and used by the students.
C2. Throughout the instruction in the Calculus, connections are made to the algebra, geometry and trigonometry. Calculus becomes algebra problems during solution.
C3. Calculus is a tool kit easily used in science, medicine, business, economics et al.
C4. See C3
C5. History of mathematics is filled with lives of those involved with the calculus – Fermat, Descartes, Newton, the Bernoulli's, Leibnitz
C6.
D1. See A1
D2.
D3.
D4. See A1
D5. Develop hypotheses for a particular function and its graph and use derivatives to determine the correctness.
D6. Students are always asked to justify their solutions.
E1. The first derivative of a function is the slope of the tangent line to the original function for any of its values of the variable.
E2.
E3. First and second derivatives are applied to social, economic and scientific applications.

F1. The course uses the smart board, graphical calculators and calculus in motion software.
F2. The course uses TI calculator

INSTRUCTIONAL STRATEGIES and EVALUATION/ASSESSMENT OF STUDENTS will be found in the activities that follow.

COURSE OF STUDY

SUBJECT: CALCULUS CP **GRADE LEVEL 11,12**

TOPICS/CONCEPTS	SKILLS
1. Functions, Graphs and Limits	**Students will be able to :**
1.1 Functions	1.1 use real numbers, data, and given functions to solve problems. NJCCS 4.3,4.5
1.2 The graph of a function	1.2 sketch the graphs of relations and functions. NJCCS 4.3
1.3 Linear functions	1.3 graph families of lines. NJCCS 4.3
1.4 Mathematical models	1.4 develop equations for solving problems in varied applications. NJCCS 4.3
1.5 Limits	1.5 recognize and use properties of limits. NJCCS 4.5
1.6 Continuity	1.6 identify functions that are continuous for all reals or on certain intervals of the real number line. NJCCS 4.5

COARSE OF STUDY

SUBJECT: Calculus CP **GRADE LEVEL: 11,12**

PROCEDURES	ACTIVITIES
The teacher will:	**The student will:**
1.1 review functional notation.	1.1 use functional notation to solve real world applications.
1.2 review graphing by graphing calculator.	1.2 determine intercepts and vertices.
1.3 review slope and intercepts.	1.3 graph families of curves with a graphing calculator.
1.4 review methods of problem solving.	1.4 solve real world problems.
1.5 review limit.	1.5 solve problems involving limits.
1.6 describe functions that are continuous over specific intervals.	1.6 find points of discontinuity and use the intermediate value property.

COURSE OF STUDY

SUBJECT: Calculus CP **GRADE LEVEL: 11,12**

EVALUATION	ADDITIONAL COMMENTS
1.1 Evaluation will be done by the use of 1.2 one or two tests per unit, quizzes, 1.3 homework and classwork. 1.4	1.1-1.6 1.1Throughout this course, many useful 1.2 review questions will be assigned from 1.3 the extensive chapter reviews and from 1.4 a packet of exercises that the instructor will be distributing at the beginning of the year from the exercises that accompany the Paul Foerster text. Available for this course is the use of TI83 and 89 calculators and their accompanying overhead device or TI84 emulation software. As previously mentioned, the course will also make use of the Calculus in Motion software and the Geometry Sketchpad software for instructor presentation purposes and student projects. NJCCS 8.1,8.2

COURSE OF STUDY

SUBJECT: Calculus CP **GRADE LEVEL: 11,12**

TOPIC/CONCEPTS	SKILLS
2. Differentiation	**2. Students will be able to :**
2.1 Slope and rates of change	2.1 calculate rates of change NJCCS 4.3,4.5
2.2 Constant, power and sum rules	2.2 use techniques of differentiation. NJCCS 4.3,4.5,8.1,8.2
2.3 Product and quotient rules	2.3 use techniques of differentiation. NJCCS 4.3,4.5
2.4 Marginal analysis	2.4 use approximation by incremental change to discover elements of determining fractional powers and elements of economics. 4.3,4.5
2.5 Chain Rule	2.5 find derivatives of composite functions. NJCCS 4.3,4.5
2.6 Second derivative	2.6 use the second derivative in varied applications. NJCCS 4.3,4.5,8.1,8.2
2.7 Implicit differentiation	2.7 solve related rates problems. NJCCS 4.3,4.5
2.8 Derivatives of sine and cosine	2.8 use the limit definition of the first derivative to determine these derivatives. NJCCS4.3,4.5,8.1,8.2
2.9 Derivatives of the other four functions	2.9 use the product and quotient rules. NJCCS 4.3,4.5

COURSE OF STUDY

SUBJECT: Calculus CP **GRADE LEVEL: 11,12**

PROCEDURES	ACTIVITIES
The teacher will:	**The student will:**
2.1 define first derivative as a limit.	2.1 use the limit definition to determine the first derivative of a function.
2.2 through the use of the Ti-89's scripting ability, calculus in motion or with power point slides, show techniques of differentiation.	2.2 determine rules of differentiation.
2.3 use iuductive methods to develop the product and quotient rules.	2.3 Use the product and quotient rules.
2.4 demonstrate the use of differentials in marginal analysis with varied disciplines.	2.4 solve problems in many disciplines with differentials.
2.5 use inductive methods to demonstrate the chain rule.	2.5 solve problems with the generalized power rule.
2.6 demonstrate application of the second derivative.	2.6 discover the nth derivative.
2.7 use inductive methods to demonstrate related rate solutions.	2.7 solve related rate problems in varied applications.
2.8 use the limit definition of the derivative.	2.8 use differential methods to determine first derivatives involving trigonometric functions.
2.9 review the product and quotient rules.	2.9 use differential methods to determine first derivatives involving trigonometric functions.

COARSE OF STUDY

SUBJECT: Calculus CP **GRADE LEVEL: 11,12**

EVALUATION	ADDITIONAL COMMENTS
2.1 2.2 2.3 Evaluation will be done through the 2.4 use of one or two tests per unit, 2.5 quizzes, homework and classwork. 2.6 2.7 2.8 2.9	

COARSE OF STUDY

SUBJECT: Calculus CP **GRADE LEVEL: 11,12**

TOPIC/CONCEPTS	SKILLS
3 Additional derivatives	**Students will be able to:**
3.1 Increasing and decreasing functions	3.1 use the first derivative test. NJCCS 4.3,4.5
3.2 Concavity	3.2 use the second derivative test. NJCCS 4.3,4.5,8.1,8.2
3.3 Limits involving infinity	3.3 determine limits that involve the locations of + & - infinity. NJCCS 4.3,4.5
3.4 Techniques of optimization	3.4 identify absolute extrema on closed intervals. NJCCS 4.3,4.5
3.5 Practical optimization	3.5 find extrema using the first and second derivatives. NJCCS 4.3,4.5

COARSE OF STUDY

SUBJECT: Calculus CP **GRADE LEVEL: 11,12**

PROCEDURES	ACTIVITIES
The teacher will:	**The student will:**
3.1 demonstrate the use of the first derivative to determine the activity of a function.	3.1 determine whether a function is increasing or decreasing.
3.2 introduce the use of the second derivative to determine concavity.	3.2 know whether a function is concave up or concave down.
3.3 describe the method for evaluating a limit that involves infinity.	3.3 calculate limits at infinity.
3.4 show methods for determining absolute extrema.	3.4 use endpoints and critical points to locate absolute extrema.
3.5 display methods for discovering extrema.	3.5 use critical points and the first or second derivative.

COARSE OF STUDY

SUBJECT: Calculus CP **GRADE LEVEL: 11,12**

EVALUATION	ADDITIONAL COMMENTS
3.1 Evaluation will be done by the use of 3.2 one or two tests per unit, quizzes, 3.3 homework and classwork. 3.4 3.5	

COARSE OF STUDY

SUBJECT: <u>**Calculus CP**</u> **GRADE LEVEL: 11,12**

TOPIC/CONCEPTS	SKILLS
4 **Exponential and Logarithmic Functions**	**Students will be able to :**
4.1 Exponential functions	4.1 graph functions of the form f(x) = b^x. NJCCS 4.3,4.5,8.1,8.2
4.2 Logarithmic functions	4.2 graph the natural logarithm. NJCCS 4.3,4.4,8.1,8.2
4.3 Differentiation of these functions	4.3 determine derivatives of these functions. NJCCS 4.3,4.5,8.1,8.2
4.4 Additional exponential models	4.4 graph polynomial and rational functions by determining critical and inflection points and by determining vertical and horizontal asymptotes. NJCCS 4.3,4.5,81,8.2

COARSE OF STUDY

SUBJECT: Calculus CP **GRADE LEVEL: 11,12**

PROCEDURES	ACTIVITIES
The teacher will :	**The student will :**
4.1 introduce exponential functions.	4.1 solve and interpret interest and growth problems.
4.2 review properties of the natural logarithm.	4.2 use properties of the natural logarithm.
4.3 use inductive procedures with the TI89, power point or calculus in motion, to lead student to the determination of the derivatives of the natural logarithm and the exponential functions.	4.3 use derivatives of these functions in applications.
4.4 use the TI89 or calculus in motion to model the growth of disease, rumors, et al.	4.4 use derivatives, limits and zeros to sketch curves of these functions.

COARSE OF STUDY

SUBJECT: Calculus CP **GRADE LEVEL: 11,12**

EVALUATION	ADDITIONAL COMMENTS
4.1 Evaluation will be done by the use of 4.2 one or two tests per unit, quizzes, 4.3 homework and classwork. 4.4	

COARSE OF STUDY

SUBJECT: Calculus CP **GRADE LEVEL: 11,12**

TOPIC/CONCEPTS	SKILLS
5 Antidifferentiation	**Students will be able to :**
5.1 Antiderivative, Indefinite Integral	5.1 know and apply the basic integral formulas NJCCS 4.3,4.5
5.2 Integration by Substitution.	5.2 choose an appropriate u, determine du and f(u) du. NJCCS 4.3,4.5,8.1,8.2
5.3 Differential Equations	5.3 solve separable differential equations for their general solutions. NJCCS 4.3,4.5
5.4 Integration by Parts	5.4 choose a u and dv and solve to du and v and then use uv – the integral of v du. NJCCS 4.3,4.5
5.5 Integration of the Trigonometric Functions	5.5 determine the antiderivatives of each of the six functions. NJCCS 4.3,4.5
5.6 Substitution and Parts as Applied to the Six Trigonometric Functions	5.6 use substitution and parts to solve integrals with trigonometric integrands. NJCCS 4.3,4.5

COARSE OF STUDY

SUBJECT: Calculus CP **GRADE LEVEL: 11,12**

PROCEURES	ACTIVITIES
The teacher will:	**The student will:**
5.1 review derivative formulas and introduce basic integration formulas.	5.1 apply the basic integration formulas.
5.2 introduce integration by substitution.	5.2 use integration by substitution.
5.3 demonstrate how to separate variables in a separable differential equation.	5.3 integrate the separated portions of separable differential equations.
5.4 discuss how and when to use integration by parts.	5.4 apply integration by parts to fund raising, marginal cost and population growth questions.
5.5 demonstrate the above methods relative to the six trigonometric functions.	5.5 integrate the trigonometric functions.
5.6 discuss the application of the six trigonometric functions,	5.6 solve real world problems involving trigonometric functions.

COARSE OF STUDY

SUBJECT: Calculus CP **GRADE LEVEL: 11,12**

EVALUATION	ADDITIONAL COMMENTS
5.1 Evaluation will be done by the use of 5.2 one or two tests per unit, quizzes, 5.3 classwork and homework. 5.4 5.5 5.6	

COARSE OF STUDY

SUBJECT: Calculus CP **GRADE LEVEL: 11,12**

TOPICS/CONCEPTS	SKILLS
6. Definite Integrals	**Students will be able to :**
6.1 Definite Integration	6.1 determine area under the graph of a function. NJCCS 4.3,4.5,8.1,8.2
6.2 Applications to business and economics.	6.2 determine costs and quantities by calculating the area between two curves. NJCCS 4.3,4.5,8.1,8.2
6.3 Applications to Other Disciplines	6.3 calculate the average value of a function. NJCCS 4.3,4.5,8.1,8.2
6.4 Improper Integrals	6.4 use limits to calculate integrals at infinity. NJCCS 4.3,4.5

COARSE OF STUDY

SUBJECT: Calculus CP **GRADE LEVEL: 11,12**

PROCEDURES	ACTIVITIES
The teacher will:	**The student will:**
6.1 demonstrate accumulation techniques.	6.1 calculate area under the graph of a function.
6.2 display techniques of integration applied to business and economics.	6.2 use the area between two curves to calculate solutions to problems in economics.
6.3 demonstrate additional applications of the definite integral.	6.3 Solve problems in varied disciplines with definite integration.
6.4 describe the technique for calculating an improper integral	6.4 calculate the time of decay and calculate probability density using improper integrals

COARSE OF STUDY

SUBJECT: Calculus CP **GRADE LEVEL: 11,12**

EVALUATION	ADDITIONAL COMMENTS
6.1 Evaluation will be done by the use 6.2 of one or two tests per unit, quizzes, 6.3 classwork and homework. 6.4	

EVALUATION/ASSESSMENT OF CURRICULUM:

This course of study will be evaluated/assessed by instructional staff during the first year of implementation for the purpose of necessary revision at the end of the first year. In addition, this course of study will be reviewed according to the Five-Year Curriculum Review schedule (see attached).

RESOURCES/BIBLIOGRAPHY:

Textbook: Calculus for Business, for Business, Economics and the Social Sciences
Hoffmann & Bradley, McGraw-Hill, 2000

Other Reference Texts: Calculus: Graphical, Numerical, Algebraic, Finney, DeMana, Waits, Kennedy; Addison-Wesley, 1999
Calculus: Concepts and Application, Foerster, Key Curriculum Press, 1998
Calculus: Concepts and Contexts, Stewart, Brooks Cole Publishing, 2001