

**Trinity Area School District  
Template for Curriculum Mapping, 2017-2018**

<b>Course: AP Calculus AB</b> <b>Grade: 11 - 12</b>	<b>Overview of Course:</b> The Advanced Placement Calculus AB course is a one-year college-level course. It is designed to present high school students to the major concepts and applications of both differential and integral calculus. The AP Calculus AB Content, as designated by the College Board, is the focus of the course. Students explore, discuss, study, and analyze many broad conceptual themes that include limits, continuity, differentiation and integration concepts and rules, slope fields, applications of differentiation and integration, volumes of solids, and L'Hopital's Rule. Such content will be updated each time changes are made by the College Board in the AP Calculus AB Course Description. Students must be willing to make a significant commitment of their time in order to be prepared for everyday instruction. Because the students are able to earn college credit for this course, it is taught at a rigorous level, which is expected by the College Board.
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## **AP<sup>®</sup> Calculus AB**

### **Course Syllabus**

#### **Prerequisites**

Before studying calculus, all students should complete four years of secondary mathematics designed for college-bound students: courses in which they study algebra, geometry, trigonometry, analytic geometry, and elementary functions. These functions include those that are linear, polynomial, rational, exponential, logarithmic, trigonometric, inverse trigonometric, and piecewise defined. In particular, before studying calculus, students must be familiar with the properties of functions, the algebra of functions, and the graphs of functions. Students must also understand the language of functions (domain and range, odd and even, periodic, symmetry, zeros, intercepts, and so on) and know the values of the trigonometric functions of the numbers 0,  $\pi/6$ ,  $\pi/4$ ,  $\pi/3$ ,  $\pi/2$ , and their multiples.

#### **Course Description**

The Advanced Placement Calculus AB course is a one-year college-level course. It is designed to present high school students to the major concepts and applications of both differential and integral calculus. The AP Calculus AB Content, as designated by the College Board, is the focus of the course. Students explore, discuss, study, and analyze many broad conceptual themes that include limits, continuity, differentiation and integration concepts and rules, slope fields, applications of differentiation and integration, volumes of solids, and L'Hopital's Rule. Such content will be updated each time changes are made by the College Board in the AP Calculus AB Course Description. Students must be willing to make a significant commitment of their time in order to be prepared for everyday instruction. Because the students are able to earn college credit for this course, it is taught at a rigorous level, which is expected by the College Board.

A TI-83 Plus or TI-84 Plus is required for the course. A TI-83 Plus calculator will be provided by school for those without one. Graphing calculators and computer software are used as a tool to improve understanding, but not as a substitute to learning. Each concept is studied both with and without the use of a graphing calculator. Throughout the school year students will be given some tests to complete, minus the use of calculators. This will determine their skill level in evaluating limits, derivatives, and integrals. On many of the other tests however, I will allow calculators to be used to challenge their understanding of the concepts and to give them the freedom to choose a numerical or graphical approach to solving the problems. Utilizing their calculators also gives the students the ability to enhance their understanding, visualize functions, perform tedious arithmetic calculations, and to check an analytical solutions. Graphing calculators and computer software also provides the students with more confidence in working with new concepts. We are also participating the NMSI program so we will be utilizing NMSI resources and study sessions.

This is a full year course and each student is expected to take the College Board AP Test in May to complete the course requirements. At the conclusion of this course, students may earn college credits by taking the test prepared by the College Entrance Examination Board. The results will be certified by the testing agency to college admission officers for possible advanced standing and/or credit in the freshman year at college.

### **Course Goals**

Students will:

- Read the appropriate sections in their text, as well as the teacher created notes prior to each class session.
- Focus heavily on using proper terminology when communicating mathematics both orally and in well-written sentences and should be able to thoroughly explain solutions to problems. A correct result with no supporting evidence is awarded little if any credit.
- Work with functions represented in a variety of ways: graphical, algebraic, numerical, analytical, or verbal. They should understand the connections among these representations.
- Understand the meaning of the derivative in terms of a rate of change and local linear approximation and they should be able to use derivatives to solve a variety of problems.
- Understand the meaning of the definite integral both as a limit of Riemann sums and as the net accumulation of change and should be able to use integrals to solve a variety of problems.
- Understand the relationship between the derivative and the definite integral as expressed in both parts of the Fundamental Theorem of Calculus.
- Model a written description of a physical situation with a function, a differential equation, or an integral.
- Use calculators and computer software to help solve problems, experiment, interpret results, and verify conclusions.
- Demonstrate the use of the calculators and computer software with the Promethean Board, Smart View Software, ActivExpressions, and ActivSlate.
- Determine the reasonableness of solutions, including sign, size, relative accuracy, and units of measurement.
- Gain the deepest possible understanding to the course through lecture, class discussions, investigation, collaborative group and individual work, classroom projects, and homework assignments and projects.
- Develop an appreciation of calculus as a coherent body of knowledge and as a human accomplishment.

**Text**

*Calculus Graphical, Numerical, Algebraic* by Finney, Demana, Waits, Kennedy; Boston, MA: Pearson, Prentice Hall, 2007 Third AP® Edition

**Other Resources**

*Teachers AP Correlations and Preparation Guide* by Finney, Demana, Waits, Kennedy; Boston, MA: Pearson, 2007

**Other Resources continued**

*AP Solutions Manual* by Finney, Demana, Waits, Kennedy; Boston, MA: Pearson, 2007

*AP Student Practice Workbook* by Finney, Demana, Waits, Kennedy; Boston, MA: Pearson, 2007

*AP Assessment Resources* by Finney, Demana, Waits, Kennedy; Boston, MA: Pearson, 2007

MathXL for AP Calculus Software

Sketchpad Computer Software with *Calculus in Motion*

Study Island – AP Calculus AB Software

TI-83 Plus or TI-84 Plus Graphing Calculators

Released AP Exams and Free-Response AP Exams from the College Board

**Calculator**

TI-84 Plus (Provided by school) If the student provides their own, the TI-83 Plus or TI-84 Plus is recommended.

**Computer Software**

The students will use computer software, Study Island, to supplement various in-class assignments. Study Island is a computer software program that is highly customized to specific topics in math, among other subjects. Study Island provides instructional, practice, assessment, and productivity tools that improve the performance of students via web-based platforms.

There are interactive features and games that engage students while reinforcing and rewarding the students' learning achievement. Study Island's programs enable educators to track student performance in real-time to address individual learning needs, while allowing administrators to monitor student progress and measure teacher effectiveness. The programs are designed to create a very user-friendly experience for both students and teachers.

With the Study Island AP Statistics test preparation program, students will master the knowledge and skills needed to succeed. The programs are simultaneously accessible to all students and can be used at home or school. Items found in the AP portion of Study Island include the following:

- Full-length practice test
- Customized to College Board specifications
- Free-response question prompts
- Rigorous content

### **Student Evaluation**

- Test/Quiz – 50 points each
  - An assessment will be given upon the completion of each major unit of study. There will be approximately 12 unit/chapter tests throughout the school year. Some tests will be taken without the use of a calculator.
- Homework – 2 points each
  - Homework will be completed on a daily basis for effort/completion.
- Bell Work – 20 points each
  - Memorization and quick recollection of certain mathematical concepts will enhance (or hinder) your success in this course. Upon the completion of each unit of study, a timed, drill-based assessment will be given covering a topic that will be practiced daily during the unit.
- Projects – range from 10 - 20 points each
  - Several individual and/or group projects are completed throughout the year. The projects are used to apply the calculus concepts from the course to real-life situations and to refine and deepen their understanding of the concepts. The projects were developed by or given to by previous AP Calculus AB Teachers.
  - Please refer to the end of this document to view some of these projects.
- Midterm – 50 points
  - A cumulative midterm will be taken at the end of the semester.
- Final – 100 points
  - A cumulative final will be taken at the end of the course.

## AP Calculus AB Course Outline

### • Chapter 1 – Prerequisites for Calculus AB (11 days – completed over the summer)

#### ○ Lesson Objectives:

- In this unit of study we will review concepts studied in Pre-Calculus. We will review how to write equations for lines, identify domain, range, even and odd functions, and how to graph functions. We will spend time reviewing inverses, which will provide the connection for us between exponential and logarithmic equations. Finally, we will review trigonometric functions. Students will be provided with the materials and videos needed to complete Chapter 1 before they leave for summer break. All students are required to complete summer work reviewing precalculus and Algebra 2 concepts prior to entry in the course. Students will be provided with and expected to regularly use a school issued TI-84 graphing calculator. All materials will also be provided on my teacher page. On returning to school, we will have two days for a class review, and then a test on the section.

LESSON	ASSESSMENTS
The Unit Circle	* Bell Work
1.2 – Piecewise Functions	* Assignments
1.4 – Parametric Equations	* Writing Assignment
1.4 – Parametric Equations	* Independent Study
1.5 – Inverses	* Class Participation
1.5 – Exponential/Logarithmic Functions	* ActivExpressions
1.6 – Trigonometric Functions	* Group Work
Review Chapter 1	* AP Released Exam items
BW Quiz, Ch. 1 Review	* Test
Chapter 1 Test	

### • Chapter 2 – Limits and Continuity (13 days)

#### ○ Lesson Objectives:

- In Chapter 2, we will focus on the Limits of a Function. Stated simply, a limit is simply the y-value a function approaches as it gets very, very close to a particular x-value. This concept seems easy enough, but the type of function (how it behaves around the

x-value of interest) tends to complicate things a bit. Some functions have holes in them, others have vertical asymptotes, and others jump erratically to new y-values unexpectedly (Piecewise functions). In order to conquer the world of limits by examining x-y tables, using algebra, and observing graphs both my hand and with the use of the TI-84 Calculator and computer software. The knowledge we build in this unit of study is foundational to the understanding of derivatives, the topic of Chapter 3.

LESSON	ASSESSMENTS
2.1 – Limits	* Bell Work
2.1 – One-Sided Limits	* Assignments
2.1 – Limits with Graphs & Tables	* Writing Assignment
2.2 – End Behavior Models	* Independent Study
2.2 – Horizontal & Vertical Asymptotes	* Class Participation
Review of Limits	* ActivExpressions
2.3 – Continuity	* Project
2.3 – Continuity	* Project
2.4 – Rates of Change	* Group Work
2.4 – Slope, Tangent, & Normal Lines	* Study Island
Limit Review	* AP Released Exam items
Limit Review	* Test
Limit Test	

• **Chapter 3 (Sections 1 – 4) – Derivatives (13 days)**

○ Lesson Objectives:

- Chapter 3 is the largest chapter we will be covering. It consists of 9 sections. We will treat sections 1 – 4 as one unit of study and 5 – 9 as another. The theme of the chapter is derivatives. We will start off by using the definition of a derivative to gain a solid understanding of how the derivative of a function is just the slope of the function. We will study derivatives algebraically (calculations), graphically (visually), and numerically (calculator approximations) all with and without a calculator. Derivatives represent slope, or rate of change, and have many practical applications. In Section 3.4 we will use derivatives to determine the

velocity, speed, and acceleration of an object. We will also use derivatives to determine the rate at which the volume of a balloon is increasing, how quickly an object is falling, and how fast lilies grow.

LESSON	ASSESSMENTS
3.1 – Definition of a Derivative	* Bell Work
3.2 - Where $f'$ Fails to Exist - Derivatives on the Calculator	* Assignments
3.3 – Derivative Rules	* Writing Assignment
3.3 – Higher Order Derivatives & Horizontal Tangents	* Independent Study
3.3 – Derivative Rules & Review	* Class Participation
3.4 – Rate of Change Applications	* ActivExpressions
3.4 – Reading Velocity Graphs	* Project
3.4 – Particle Motion	* Group Work
3.4 – Particle Motion	* Study Island
Graphs of Derivatives	* AP Released Exam items
Derivative Review	* Test
Derivative Review	
Chapter 3a Test	

• **Chapter 3 (Sections 5 – 9) – Derivatives (19 days)**

○ Lesson Objectives:

- In the first half of Chapter 3 we saw that “The Derivative” of a function, gave a formula for the slope of the tangent line at any point on the function. By finding a function’s derivative, we can know the instantaneous rate of change at any point on the curve. In the second half of Chapter 3 we will continue to find the derivatives of functions. We will focus on the derivative of Trig Functions, Composite Functions, Parametric Functions, Inverse Trig Functions, Implicit Functions, Exponential Functions, and

finally, Logarithmic Functions. We will apply this new knowledge to former problems like: Finding equations of tangent and normal lines, particle motion, velocity, speed, and acceleration.

LESSON	ASSESSMENTS
3.5 – Derivatives of Trig Functions, Simple Harmonic Motions, Jerks	* Bell Work
	* Assignments
3.5 – Derivatives of Trig Functions	* Writing Assignment
3.6 – The Chain Rule	* Independent Study
3.6 – The Chain Rule	* Class Participation
3.6 – The Chain Rule	* ActivExpressions
3.6 – Differentiating Parametric Equations	* Project
3.7 – Implicit Differentiation	* Group Work
3.7 – Implicit Differentiation	* Study Island
Derivative Mixed Review	* AP Released Exam items
3.8 – Derivatives of Inverse Trig Functions	* Test
3.8 – Derivatives of Inverse Trig Functions	
3.9 – Derivatives of Exponential Functions	
3.9 – Derivatives of Logarithmic Functions	
3.9 – Logarithmic Differentiation	
Derivative Mixed Review	
Review Sections 3.5 – 3.9	
Review Sections 3.5 – 3.9	
Chapter 3b Test	



Chapter 3b Test	
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• **Chapter 4a (Sections 1 – 3) – Derivative Applications (15 days)**

○ Lesson Objectives:

- In this unit we will spend a great deal of time analyzing characteristics of functions analytically and graphically. We will identify the intervals on which a function is increasing, decreasing, concave up, and concave down. We will also determine the absolute highest and lowest value a function obtains (absolute maximum and minimum), as well as identifying any other peaks and valleys (local maximums and minimums). These will also be found using the command features on the TI-84 calculator. This first half of Chapter 4 is foundational to the second half of the chapter. In the second half, we will apply the mathematical skills we have learned to solve a wide variety of application problems.

LESSON	ASSESSMENTS
4.1 – Extreme Values (Graphically)	* Bell Work
4.1 – Extreme Values (Analytically)	* Assignments
4.1 – Extreme Values (Analytically)	* Writing Assignment
4.1 - Extreme Values (Analytically)	* Independent Study
4.3 – First Derivative Test	* Class Participation
4.3 – Concavity, Inflection Points	* ActivExpressions
4.3 – Extreme Value Applications	* Project
4.3 – 2 <sup>nd</sup> Derivative Test, Particle Motion	* Group Work
4.3 – Sketching $f(x)$ from Clues	* Study Island
4.3 – Sketching $f(x)$ from a graph of $f'(x)$	* AP Released Exam items
4.3 – Sketching $f(x)$ from an equation, $f(x)$	* Test

4.2 – Mean Value Theorem	
Review Sections 4.1 – 4.3	
Review Sections 4.1 – 4.3	
Chapter 4a Test	

• **Chapter 4b (Sections 4 – 6) – Optimization, Linearization, & Related Rates (13 days)**

○ Lesson Objectives:

- In this second half of Chapter 4, we will complete section 4.5 out of order. Sections 4.4 and 4.6 mesh well together, so we will complete them one after another. The general overriding theme for these sections is derivative applications. We will solve application problems involving find the maximum and minimum quantities possible for various situations. In Section 4.6 we will learn how to solve related rates problems. We will complete many examples together because the best way to become good at setting up and solving the problems is through experience.

LESSON	ASSESSMENTS
4.4 – Optimization	* Bell Work
4.4 – Optimization	* Assignments
4.4 – Optimization	* Writing Assignment
4.6 – Related Rates	* Independent Study
4.6 – Related Rates	* Class Participation
4.6 – Related Rates	* ActivExpressions
4.6 – Related Rates	* Project
4.6 – Related Rates	* Group Work

4.5 – Differentials	* Study Island
4.5 – Linearization	* AP Released Exam items
Review Sections 4.4 – 4.6	* Test
Review Sections 4.4 – 4.6 (Ch. 4b Bell Work Test)	* Midterm
Ch. 4b Test	

• **Chapter 5a – The Definite Integral (10 days)**

○ Lesson Objectives:

- In Chapter 5, we will learn the reverse process of derivatives and its applications. The antiderivative is represented geometrically as the area under the curve between two bounds. Prior to calculus, the area under a curve could be estimated by dividing the area into many thin, tall rectangles. The area of each rectangle could be found, so the area under the curve could be assumed to be approximately the total area of all of those little rectangles. As the chapter unfolds, the students will see that calculus makes the process much easier! Students will be expected to use a school issued TI-84 graphing calculator to incorporate a Reiman Program and to evaluate the definite integrals.

LESSON	ASSESSMENTS
5.1 – RAM (Functions)	* Bell Work
5.1 – RAM (Data)	* Assignments
5.5 – Trapezoidal Rule	* Writing Assignment
Review	* Independent Study
5.2 – Intro to Definite Integrals	* Class Participation
5.2 – Definite Integrals	* ActivExpressions
5.2 – Writing Definite Integrals	* Project
Definite Integral Rules	* Group Work

5.3 – Average Value	* Study Island
Review	* AP Released Exam items
Chapter 5a Test	* Test

• **Chapter 5b – The Definite Integral (12 days)**

○ Lesson Objectives:

- In Chapter 5, we will learn the reverse process of derivatives and its applications. The antiderivative is represented geometrically as the area under the curve between two bounds. Prior to calculus, the area under a curve could be estimated by dividing the area into many thin, tall rectangles. The area of each rectangle could be found, so the area under the curve could be assumed to be approximately the total area of all of those little rectangles. The students will also learn how to check their answers using the command in their calculators. As the chapter unfolds, the students will see that calculus makes the process much easier! Students will be expected to use a school issued TI-84 graphing calculator to compare Reiman Program and evaluating the integrals using antiderivatives, as well as checking their answers..

LESSON	ASSESSMENTS
5.3 – Definite Integral Rules	* Bell Work
5.3 – Average Value of a Function	* Assignments
4.2 – Antidifferentiation	* Writing Assignment
4.2 – Applications	* Independent Study
5.3 – Antiderivatives	* Class Participation
5.4 – Fundamental Theorem of Calculus ( I )	* ActivExpressions
5.4 – Fundamental Theorem of Calculus ( II )	* Project
	* Group Work

5.4 – Finding Total Area Using Integrals	* Study Island * AP Released Exam items * Test
5.4 – Reading Graphs, FTC Practice	
5.4 – Reading Graphs, FTC Practice	
Review	
Chapter 5b Test	

• **Chapter 6a – Differential Equations & Mathematical Modeling (11 days)**

○ Lesson Objectives:

- Many physical, biological, and chemical relationships can be modeled by differential equations, which describe the rate at which something changes. In the first section, we will learn how to solve differential equations by using antidifferentiation. We will also see how to graph slope fields to “see” the solutions to the differential equation without actually solving. In the second section we will be introduced to the indefinite integral and learn how to integrate by using u-substitution. In Section 6.4, we will learn how to solve first order differential equations through the use of separation of variables. We will finish with applications of differential equations. Students will be expected to use a school issued TI-84 graphing calculator to incorporate Slope Field problems to compare their results of the solution curves to exact differential equations.

LESSON	ASSESSMENTS
6.2 – Indefinite Integrals	* Bell Work * Assignments
6.1 – Differential Equations	* Writing Assignment
6.1 – Slope Fields	* Independent Study
6.1 – Slope Fields	* Class Participation

6.4 – Separation of Variables	* ActivExpressions
6.4 – Separation of Variables	* Project
6.4 – Separation of Variables	* Group Work
6.4 – Separation of Variables	* Study Island
6.4 – Exponential Growth & Decay	* AP Released Exam items
6.4 – Exponential Growth & Decay	* Test
Review	
Test	

• **Chapter 6b – Differential Equations & Mathematical Modeling (13 days)**

○ Lesson Objectives:

- In this unit we will study various integration techniques. You have already learned how to find integrals through the use of antiderivatives. Now we will learn the reverse procedure for the chain rule and for the product rule. We will finish by learning how to integrate through the use of partial fraction decomposition. Students will be expected to use a school issued TI-84 graphing calculator to compare and contrast the graphs of their solutions to the differential equations given.

LESSON	ASSESSMENTS
6.2 – $u$ -Substitution	* Bell Work
6.2 – $u$ -Substitution	* Assignments

6.2 – $u$ -Substitution with Trig Identities	* Writing Assignment
6.2 – $u$ -Substitution	* Independent Study
6.2 – $u$ -Sub with Definite Integrals	* Class Participation
6.2 – $u$ -Substitution with Trig Identities	* ActivExpressions
6.2 – $u$ -Substitution	* Project
6.2 – Integration Word Problems	* Group Work
6.4 – Separation of Variables (Review)	* Study Island
Integration – Mixed Review	* AP Released Exam items
Integration – Mixed Review	* Test
Review	
Test	

• **Chapter 7 – Applications of Definite Integrals (17 days)**

○ Lesson Objectives:

- In Chapter 7 we will review particle motion, and then go into two related topics: The area between two curves and volumes of revolution. Prior to Calculus we only learn how to find area and volume of traditional geometric shapes. Now we can find the area and volume of any 2D or 3D shape, no matter how unusual, that we desire. We will use integration to accomplish this task. Students will be expected to use a school issued TI-84 graphing calculator as well as incorporate SketchPad with *Calculus in Motion* to view the areas between curves and their volumes.

LESSON	ASSESSMENTS
7.1 – Particle Motion	* Bell Work

7.1 – Particle Motion	* Assignments
7.1 – Particle Motion	* Writing Assignment
7.1 – Particle Motion	* Independent Study
7.1 – Particle Motion	* Class Participation
7.2 – Area Between Two Curves	* ActivExpressions
7.2 – Area Between Two Curves	* Project
7.2 – Area Between Two Curves	* Group Work
7.2 - Area Between Two Curves	* Study Island
7.3 – Volumes (Cross Sections)	* AP Released Exam items
7.3 – Volumes (Revolution)	* Test
7.3 – Volumes (Revolution)	
7.3 – Area & Volumes (Review)	
7.3 – Area & Volumes (Review)	
Review Sections 7.1 – 7.3	
Review Sections 7.1 – 7.3	
Test	

- **Section 8.2 – L’Hopital’s Rule (4 days)**

- Lesson Objectives:

- In Section 8.2 we will take another look at limits. In Chapter 2, we learned how to find the limit of a function with substitution, by using algebra, by looking at tables, and graphically. Many of the limits we were asked to find were not able to be found through substitution. In this section we will learn how to apply L’Hopital’s rule in certain cases to find the limit of a function.



LESSON	ASSESSMENTS
8.2 – Limit Review & L'Hopital's Rule Forms: $(0/0)$ and $(\infty/\infty)$	* Independent Study * Class Participation
8.2 – L'Hopital's Rule Practice Review of Horizontal & Vertical Asymptotes	* ActivExpressions
8.2 – Practice / Review (p. 11-14 of this packet)	* Group Work * Study Island
Quiz on L'Hopital's Rule	* AP Released Exam items * Test

• **AP Calculus AB Test Preparation**

- This schedule will give some flexibility for review time before the AP exam. For reviewing purposes, I use the last three AP Released Exams, the last several Released Free Response Exams, as well the computer software Study Island. In addition, the multiple choice and free response questions are used in every chapter's note packets, when appropriate, throughout the year. Before and after school sessions are offered in March and April to help students prepare for the AP Exam. Students will be expected to use a school issued TI-84 graphing calculator for the questions allowing a calculator on the exam.

LESSON	ASSESSMENTS
Flashcard Scavenger Hunt	* Assignments * Writing Assignment
1a: Derivative & Integration Applications Particle Motion	* Independent Study
1b: Derivative & Integration Applications General Word Problems	* Class Participation * ActivExpressions

1c: Derivative & Integration Applications Data Problems	<ul style="list-style-type: none"> <li>* Project</li> <li>* Group Work</li> <li>* Study Island</li> <li>* AP Released Exam items</li> <li>* AP Test</li> <li>* Final Exam</li> </ul>
2a: Reading Graphs of $f'(x)$	
2b: Reading Graphs of $f'(x)$	
2c: Reading Graphs of $f'(x)$	
3a: Slope Fields & Separable Differential Equations	
3b: Related Rate	
3c: Implicit Differentiation & Tangent Lines	
3d: Area & Volume Problems	
3e: Anything Goes!	
Multiple Choice Practice Test	
Review/Score the Multiple Choice Practice Test	
AP Calc Test	

College Board Alignment	Benchmark Standards	Content Standards	Suggested Strategies and Activities	Assessment
2.4	<p>A. Use direct proofs, indirect proofs, or proof by contradiction to validate conjectures</p> <p><b>M11.D.3.1.2</b> Determine how a change in one variable relates to a change in a second variable (e.g., <math>y=4/x</math>, if <math>x</math> doubles, what happens to <math>y</math>?).</p>	<p>The student will be able to:</p> <ul style="list-style-type: none"> <li>- Calculate average and instantaneous speeds.</li> <li>- Define and calculate limits for function values and apply the properties of limits</li> <li>- Use the Sandwich Theorems to find certain limits indirectly</li> </ul>	<ul style="list-style-type: none"> <li>• Direct Instruction</li> <li>• Student Note Sheets</li> <li>• Guided Reading Note Sheets</li> <li>• Modeling</li> <li>• Large and Small Groups</li> <li>• Manipulatives</li> <li>• Problem Solving</li> <li>• Critical Thinking</li> <li>• Board work</li> <li>• Inquiry</li> <li>• Drill and Practice</li> <li>• Computers as appropriate</li> <li>• Graphing Calculators as appropriate</li> </ul>	<p>Teacher Observation</p> <p>Worksheet</p> <p>Student Text</p> <p>Assessment Pages</p> <p>Testing Written / Oral</p> <p>Performance Task</p> <p>Math Notebooks</p>

College Board Alignment	Benchmark Standards	Content Standards	Suggested Strategies and Activities	Assessment
2.4	<p>E. Demonstrate mathematical solutions to problems in the physical sciences.</p> <p><b>M11.D.3.1.1</b> Identify, describe and/or use constant or varying rates of change.</p> <p><b>M11.D.4.1</b> Interpret and/or use linear, quadratic and/or exponential functions and their equations, graphs or tables.</p>	<p>The student will be able to:</p> <ul style="list-style-type: none"> <li>- Represent vectors in the form <math>\langle a, b \rangle</math> or <math>a\mathbf{i} + b\mathbf{j}</math> and perform algebraic computations involving vectors.</li> <li>- Use vectors to solve problems involving planar motion, velocity, acceleration, speed, and displacement.</li> <li>- Compute a unit vector and the angle between two vectors.</li> <li>- Use derivatives to analyze straight line motion and solve other problems involving rates of change.</li> </ul>	<ul style="list-style-type: none"> <li>• Direct Instruction</li> <li>• Student Note Sheets</li> <li>• Guided Reading Note Sheets</li> <li>• Modeling</li> <li>• Large and Small Groups</li> <li>• Manipulatives</li> <li>• Problem Solving</li> <li>• Critical Thinking</li> <li>• Board work</li> <li>• Inquiry</li> <li>• Drill and Practice</li> <li>• Computers as appropriate</li> <li>• Graphing Calculators as appropriate</li> </ul>	<p>Teacher Observation</p> <p>Worksheet</p> <p>Student Text</p> <p>Assessment Pages</p> <p>Testing Written / Oral</p> <p>Performance Task</p> <p>Math Notebooks</p>

College Board Alignment	Benchmark Standards	Content Standards	Suggested Strategies and Activities	Assessment
2.5	<p>A. Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.</p> <p><b>M11.D.4.1</b> Interpret and/or use linear, quadratic and/or exponential functions and their equations, graphs or tables.</p>	<p>The student will be able to:</p> <ul style="list-style-type: none"> <li>- Solve related rate problems.</li> <li>- Solve problems in which a rate is integrated to find the net change over time in a variety of applications.</li> </ul>	<ul style="list-style-type: none"> <li>• Direct Instruction</li> <li>• Student Note Sheets</li> <li>• Guided Reading Note Sheets</li> <li>• Modeling</li> <li>• Large and Small Groups</li> <li>• Manipulatives</li> <li>• Problem Solving</li> <li>• Critical Thinking</li> <li>• Board work</li> <li>• Inquiry</li> <li>• Drill and Practice</li> <li>• Computers as appropriate</li> <li>• Graphing Calculators as appropriate</li> </ul>	<p>Teacher Observation</p> <p>Worksheet</p> <p>Student Text</p> <p>Assessment Pages</p> <p>Testing Written / Oral</p> <p>Performance Task</p> <p>Math Notebooks</p>

College Board Alignment	Benchmark Standards	Content Standards	Suggested Strategies and Activities	Assessment
2.5	<p>C. Present mathematical procedures and results clearly, systematically, succinctly, and correctly.</p> <p><b>M11.D.4.1</b> Interpret and/or use linear, quadratic and/or exponential functions and their equations, graphs or tables.</p>	<p>The student will be able to:</p> <ul style="list-style-type: none"> <li>- Find linearizations and use Newton's method to approximate the zeros of a function.</li> <li>- Estimate the change in a function using differentials.</li> </ul>	<ul style="list-style-type: none"> <li>• Direct Instruction</li> <li>• Student Note Sheets</li> <li>• Guided Reading Note Sheets</li> <li>• Modeling</li> <li>• Large and Small Groups</li> <li>• Manipulatives</li> <li>• Problem Solving</li> <li>• Critical Thinking</li> <li>• Board work</li> <li>• Inquiry</li> <li>• Drill and Practice</li> <li>• Computers as appropriate</li> <li>• Graphing Calculators as appropriate</li> </ul>	<p>Teacher Observation</p> <p>Worksheet</p> <p>Student Text</p> <p>Assessment Pages</p> <p>Testing Written / Oral</p> <p>Performance Task</p> <p>Math Notebooks</p>

College Board Alignment	Benchmark Standards	Content Standards	Suggested Strategies and Activities	Assessment
2.5	<p>D. Conclude a solution process with a summary of results and evaluate the degree to which the results obtained represent an acceptable response to the initial problem and why the reasoning is valid.</p> <p><b>M11.D.4.1</b> Interpret and/or use linear, quadratic and/or exponential functions and their equations, graphs or tables.</p>	<p>The student will be able to:</p> <ul style="list-style-type: none"> <li>- Solve application problems involving finding minimum or maximum values of functions.</li> </ul>	<ul style="list-style-type: none"> <li>• Direct Instruction</li> <li>• Student Note Sheets</li> <li>• Guided Reading Note Sheets</li> <li>• Modeling</li> <li>• Large and Small Groups</li> <li>• Manipulatives</li> <li>• Problem Solving</li> <li>• Critical Thinking</li> <li>• Board work</li> <li>• Inquiry</li> <li>• Drill and Practice</li> <li>• Computers as appropriate</li> <li>• Graphing Calculators as appropriate</li> </ul>	<p>Teacher Observation</p> <p>Worksheet</p> <p>Student Text</p> <p>Assessment Pages</p> <p>Testing Written / Oral</p> <p>Performance Task</p> <p>Math Notebooks</p>

College Board Alignment	Benchmark Standards	Content Standards	Suggested Strategies and Activities	Assessment
2.8	<p>E Use equations to represent curves such as lines, circles, ellipses, parabolas and hyperbolas.</p> <p><b>M11.D.2.1.2</b> Identify or graph linear inequalities on a coordinate plane</p>	<p>The student will be able to:</p> <ul style="list-style-type: none"> <li>- Graph curves described by parametric equations.</li> <li>- Find parameterizations of circles, ellipses, line segments, and other curves.</li> </ul>	<ul style="list-style-type: none"> <li>• Direct Instruction</li> <li>• Student Note Sheets</li> <li>• Guided Reading Note Sheets</li> <li>• Modeling</li> <li>• Large and Small Groups</li> <li>• Manipulatives</li> <li>• Problem Solving</li> <li>• Critical Thinking</li> <li>• Board work</li> <li>• Inquiry</li> <li>• Drill and Practice</li> <li>• Computers as appropriate</li> <li>• Graphing Calculators as appropriate</li> </ul>	<p>Teacher Observation</p> <p>Worksheet</p> <p>Student Text</p> <p>Assessment Pages</p> <p>Testing Written / Oral</p> <p>Performance Task</p> <p>Math Notebooks</p>



College Board Alignment	Benchmark Standards	Content Standards	Suggested Strategies and Activities	Assessment
2.8	<p>L. Write the equation of a line when given the graph of the line, two points on the line, or the slope of the line and a point on the line.</p> <p><b>M11.C.3.1.2</b> Relate slope to perpendicularity and/or parallelism (limit to linear algebraic expressions; slope formula provided on the reference sheet).</p> <p><b>M11.D.2.1.3</b> Write and/or solve a linear equation from given problem situations.</p> <p><b>M11.D.3.2.2</b> Given the graph of the line, 2 points on the line or the slope and a point on a line, write or identify the linear equation in point-slope, standard and/or slope-intercept form.</p> <p><b>M11.D.3.2.3</b> Compute the slope of a linear equation or graph.</p>	<p>The student will be able to:</p> <ul style="list-style-type: none"> <li>- Use increments to calculate slopes.</li> <li>- Write an equation and sketch a graph of a line given specific information.</li> <li>- Identify the relationships between parallel lines, perpendicular lines, and slopes.</li> </ul>	<ul style="list-style-type: none"> <li>• Direct Instruction</li> <li>• Student Note Sheets</li> <li>• Guided Reading Note Sheets</li> <li>• Modeling</li> <li>• Large and Small Groups</li> <li>• Manipulatives</li> <li>• Problem Solving</li> <li>• Critical Thinking</li> <li>• Board work</li> <li>• Inquiry</li> <li>• Drill and Practice</li> <li>• Computers as appropriate</li> <li>• Graphing Calculators as appropriate</li> </ul>	<p>Teacher Observation</p> <p>Worksheet</p> <p>Student Text</p> <p>Assessment Pages</p> <p>Testing Written / Oral</p> <p>Performance Task</p> <p>Math Notebooks</p>

College Board Alignment	Benchmark Standards	Content Standards	Suggested Strategies and Activities	Assessment
2.8	<p>O. Determine the domain and range of a relation, given a graph or set of ordered pairs.</p> <p>M11.D.1 Demonstrate an understanding of patterns, relations and functions</p>	<p>The student will be able to:</p> <ul style="list-style-type: none"> <li>- Identify the domain and range of a function using its graph.</li> <li>- Recognize even and odd functions using equations and graphs.</li> <li>- Write and evaluate compositions of two functions.</li> </ul>	<ul style="list-style-type: none"> <li>• Direct Instruction</li> <li>• Student Note Sheets</li> <li>• Guided Reading Note Sheets</li> <li>• Modeling</li> <li>• Large and Small Groups</li> <li>• Manipulatives</li> <li>• Problem Solving</li> <li>• Critical Thinking</li> <li>• Board work</li> <li>• Inquiry</li> <li>• Drill and Practice</li> <li>• Computers as appropriate</li> <li>• Graphing Calculators as appropriate</li> </ul>	<p>Teacher Observation</p> <p>Worksheet</p> <p>Student Text</p> <p>Assessment Pages</p> <p>Testing Written / Oral</p> <p>Performance Task</p> <p>Math Notebooks</p>

College Board Alignment	Benchmark Standards	Content Standards	Suggested Strategies and Activities	Assessment
2.8	<p>Q. Represent functional relationships in tables, charts, and graphs</p> <p><b>M11.D.2.1.2</b> Identify or graph linear inequalities on a coordinate plane</p>	<p>The student will be able to:</p> <ul style="list-style-type: none"> <li>- Identify a one-to-one function.</li> <li>- Determine the algebraic representation and the graphical representation of a function and its inverse.</li> <li>- Use parametric equations to graph inverse functions.</li> <li>- Apply the properties of logarithms.</li> </ul>	<ul style="list-style-type: none"> <li>• Direct Instruction</li> <li>• Student Note Sheets</li> <li>• Guided Reading Note Sheets</li> <li>• Modeling</li> <li>• Large and Small Groups</li> <li>• Manipulatives</li> <li>• Problem Solving</li> <li>• Critical Thinking</li> <li>• Board work</li> <li>• Inquiry</li> <li>• Drill and Practice</li> <li>• Computers as appropriate</li> <li>• Graphing Calculators as appropriate</li> </ul>	<p>Teacher Observation</p> <p>Worksheet</p> <p>Student Text</p> <p>Assessment Pages</p> <p>Testing Written / Oral</p> <p>Performance Task</p> <p>Math Notebooks</p>

College Board Alignment	Benchmark Standards	Content Standards	Suggested Strategies and Activities	Assessment
2.8	<p>S. Analyze properties and relations and relationships of functions (linear, polynomial, rational, trigonometric, exponential, and logarithmic)</p> <p><b>M11.D.2.1.2</b> Identify or graph linear inequalities on a coordinate plane.</p> <p><b>M11.D.3.1.1</b> Identify, describe and/or use constant or varying rates of change.</p> <p><b>M11.D.3.1.2</b> Determine how a change in one variable relates to a change in a second variable (e.g., <math>y=4/x</math>, if <math>x</math> doubles, what happens to <math>y</math>?).</p> <p><b>M11.D.3.2.2</b> Given the graph of the line, 2 points on the line or the slope and a point on a line, write or identify the linear equation in point-slope, standard and/or slope-intercept form.</p> <p><b>M11.D.4.1</b> Interpret and/or use linear, quadratic and/or exponential functions and their equations, graphs or tables.</p>	<p>The student will be able to:</p> <ul style="list-style-type: none"> <li>- Determine the domain, range, and graph of an exponential function.</li> <li>- Solve problems involving exponential growth and decay.</li> <li>- Convert between radians and degrees, and find arc length</li> <li>- Identify the periodicity and even-odd properties of trigonometric functions.</li> <li>- Generate the graphs of the trigonometric functions and explore various transformations on these graphs.</li> <li>- Use the inverse trigonometric functions to solve problems.</li> <li>- Find and verify end behavior models for various functions.</li> <li>- Calculate limits as <math>x</math> approaches <math>\pm\infty</math> and to identify vertical and horizontal asymptotes.</li> </ul>	<ul style="list-style-type: none"> <li>• Direct Instruction</li> <li>• Student Note Sheets</li> <li>• Guided Reading Note Sheets</li> <li>• Modeling</li> <li>• Large and Small Groups</li> <li>• Manipulatives</li> <li>• Problem Solving</li> <li>• Critical Thinking</li> <li>• Board work</li> <li>• Inquiry</li> <li>• Drill and Practice</li> <li>• Computers as appropriate</li> <li>• Graphing Calculators as appropriate</li> </ul>	<p>Teacher Observation</p> <p>Worksheet</p> <p>Student Text</p> <p>Assessment Pages</p> <p>Testing Written / Oral</p> <p>Performance Task</p> <p>Math Notebooks</p>

<b>College Board Alignment</b>	<b>Benchmark Standards</b>	<b>Content Standards</b>	<b>Suggested Strategies and Activities</b>	<b>Assessment</b>
2.8. (cont)	S. Analyze properties and relations and relationships of functions (linear, polynomial, rational, trigonometric, exponential, and logarithmic)	<p>The student will be able to:</p> <ul style="list-style-type: none"> <li>- Identify the intervals on which a given function is continuous and understand the meaning of a continuous function.</li> <li>- Remove removable discontinuities by extending or modifying a function.</li> <li>- Apply the Intermediate Value Theorem and the properties of algebraic combinations and composites of continuous functions</li> <li>- Apply directly the definition of the slope of a curve to calculate slopes.</li> <li>- Find the equation of the tangent line and normal line to a curve at a given point.</li> <li>- Find the average rate of change of a function</li> </ul>	<ul style="list-style-type: none"> <li>• Direct Instruction</li> <li>• Student Note Sheets</li> <li>• Guided Reading Note Sheets</li> <li>• Modeling</li> <li>• Large and Small Groups</li> <li>• Manipulatives</li> <li>• Problem Solving</li> <li>• Critical Thinking</li> <li>• Board work</li> <li>• Inquiry</li> <li>• Drill and Practice</li> <li>• Computers as appropriate</li> <li>• Graphing Calculators as appropriate</li> </ul>	<p>Teacher Observation</p> <p>Worksheet</p> <p>Student Text</p> <p>Assessment Pages</p> <p>Testing Written / Oral</p> <p>Performance Task</p> <p>Math Notebooks</p>

College Board Alignment	Benchmark Standards	Content Standards	Suggested Strategies and Activities	Assessment
2.8 (cont)	S. Analyze properties and relations and relationships of functions (linear, polynomial, rational, trigonometric, exponential, and logarithmic)	<p>The student will be able to:</p> <ul style="list-style-type: none"> <li>- Calculate slopes and derivatives using the definition of the derivative</li> <li>- Graph <math>f</math> from the graph of <math>f'</math>, graph <math>f'</math> from the graph of <math>f</math>, and graph the derivative of a function given numerically.</li> <li>- Find where a function is not differentiable and distinguish between corners, cusps, discontinuities, and vertical tangents.</li> <li>- Approximate derivatives numerically and graphically.</li> <li>- Use the rules of differentiation to calculate derivatives, including second and higher order derivatives.</li> <li>- Use the derivative to calculate the instantaneous rate of change.</li> </ul>	<ul style="list-style-type: none"> <li>• Direct Instruction</li> <li>• Student Note Sheets</li> <li>• Guided Reading Note Sheets</li> <li>• Modeling</li> <li>• Large and Small Groups</li> <li>• Manipulatives</li> <li>• Problem Solving</li> <li>• Critical Thinking</li> <li>• Board work</li> <li>• Inquiry</li> <li>• Drill and Practice</li> <li>• Computers as appropriate</li> <li>• Graphing Calculators as appropriate</li> </ul>	<p>Teacher Observation</p> <p>Worksheet</p> <p>Student Text</p> <p>Assessment Pages</p> <p>Testing Written / Oral</p> <p>Performance Task</p> <p>Math Notebooks</p>

<b>College Board Alignment</b>	<b>Benchmark Standards</b>	<b>Content Standards</b>	<b>Suggested Strategies and Activities</b>	<b>Assessment</b>
2.8 (cont.)	S. Analyze properties and relations and relationships of functions (linear, polynomial, rational, trigonometric, exponential, and logarithmic)	<p>The student will be able to:</p> <ul style="list-style-type: none"> <li>- Use the rules for differentiating the six basic trigonometric functions.</li> <li>- Differentiate composite functions using the Chain Rule.</li> <li>- Find slopes of parameterized curves.</li> <li>- Find derivatives using implicit differentiation.</li> <li>- Find derivatives using the Power Rule for rational powers of <math>x</math>.</li> <li>- Calculate derivatives of functions involving the inverse Trigonometric functions.</li> <li>- Calculate derivatives of exponential and logarithmic functions.</li> <li>- Apply the Mean Value Theorem and find the intervals on which a function is increasing or decreasing.</li> </ul>	<ul style="list-style-type: none"> <li>• Direct Instruction</li> <li>• Student Note Sheets</li> <li>• Guided Reading Note Sheets</li> <li>• Modeling</li> <li>• Large and Small Groups</li> <li>• Manipulatives</li> <li>• Problem Solving</li> <li>• Critical Thinking</li> <li>• Board work</li> <li>• Inquiry</li> <li>• Drill and Practice</li> <li>• Computers as appropriate</li> <li>• Graphing Calculators as appropriate</li> </ul>	<p>Teacher Observation</p> <p>Worksheet</p> <p>Student Text</p> <p>Assessment Pages</p> <p>Testing Written / Oral</p> <p>Performance Task</p> <p>Math Notebooks</p>

College Board Alignment	Benchmark Standards	Content Standards	Suggested Strategies and Activities	Assessment
2.8 (cont)	S. Analyze properties and relations and relationships of functions (linear, polynomial, rational, trigonometric, exponential, and logarithmic)	<p>The student will be able to:</p> <ul style="list-style-type: none"> <li>- Apply the Fundamental Theorem of Calculus.</li> <li>- Understand the relationship between the derivative and definite integral as expressed in both parts of the Fundamental Theorem of Calculus.</li> <li>- Construct antiderivatives by using the Fundamental Theorem of Calculus.</li> <li>- Solve initial value problems by using Separation of Variables Method.</li> <li>- Construct slope fields numerically and interpret slope fields as visualizations of different equations.</li> <li>- Compute indefinite integrals and definite integrals by the method of substitution.</li> <li>- Find limits of indeterminate forms using L'Hôpital's Rule.</li> </ul>	<ul style="list-style-type: none"> <li>• Direct Instruction</li> <li>• Student Note Sheets</li> <li>• Guided Reading Note Sheets</li> <li>• Modeling</li> <li>• Large and Small Groups</li> <li>• Manipulatives</li> <li>• Problem Solving</li> <li>• Critical Thinking</li> <li>• Board work</li> <li>• Inquiry</li> <li>• Drill and Practice</li> <li>• Computers as appropriate</li> <li>• Graphing Calculators as appropriate</li> </ul>	<p>Teacher Observation</p> <p>Worksheet</p> <p>Student Text</p> <p>Assessment Pages</p> <p>Testing Written / Oral</p> <p>Performance Task</p> <p>Math Notebooks</p>



College Board Alignment	Benchmark Standards	Content Standards	Suggested Strategies and Activities	Assessment
2.8 (cont)	S. Analyze properties and relations and relationships of functions (linear, polynomial, rational, trigonometric, exponential, and logarithmic)	<p>The student will be able to:</p> <ul style="list-style-type: none"> <li>- Find derivatives and second derivatives of parametrically defined functions.</li> <li>- Calculate the slope of a parametrically defined function.</li> </ul>	<ul style="list-style-type: none"> <li>• Direct Instruction</li> <li>• Student Note Sheets</li> <li>• Guided Reading Note Sheets</li> <li>• Modeling</li> <li>• Large and Small Groups</li> <li>• Manipulatives</li> <li>• Problem Solving</li> <li>• Critical Thinking</li> <li>• Board work</li> <li>• Inquiry</li> <li>• Drill and Practice</li> <li>• Computers as appropriate</li> <li>• Graphing Calculators as appropriate</li> </ul>	<p>Teacher Observation</p> <p>Worksheet</p> <p>Student Text</p> <p>Assessment Pages</p> <p>Testing Written / Oral</p> <p>Performance Task</p> <p>Math Notebooks</p>

College Board Alignment	Benchmark Standards	Content Standards	Suggested Strategies and Activities	Assessment
2.11	<p>A. Determine maximum and minimum values of a function over a specified interval</p> <p><b>M11.D.4.1</b> Interpret and/or use linear, quadratic and/or exponential functions and their equations, graphs or tables.</p>	<p>The student will be able to:</p> <ul style="list-style-type: none"> <li>- Determine the local or global extreme values of a function.</li> <li>- Use the first and Second Derivative Tests to determine the local extreme values of a function.</li> <li>- Determine the concavity of a function and locate the points of inflection by analyzing the second derivative.</li> <li>- Graph <math>f</math> using information about <math>f'</math>.</li> </ul>	<ul style="list-style-type: none"> <li>• Direct Instruction</li> <li>• Student Note Sheets</li> <li>• Guided Reading Note Sheets</li> <li>• Modeling</li> <li>• Large and Small Groups</li> <li>• Manipulatives</li> <li>• Problem Solving</li> <li>• Critical Thinking</li> <li>• Board work</li> <li>• Inquiry</li> <li>• Drill and Practice</li> <li>• Computers as appropriate</li> <li>• Graphing Calculators as appropriate</li> </ul>	<p>Teacher Observation</p> <p>Worksheet</p> <p>Student Text</p> <p>Assessment Pages</p> <p>Testing Written / Oral</p> <p>Performance Task</p> <p>Math Notebooks</p>

College Board Alignment	Benchmark Standards	Content Standards	Suggested Strategies and Activities	Assessment
2.11	<p>C. Graph and interpret rates of growth/decay</p> <p><b>M11.D.4.1</b> Interpret and/or use linear, quadratic and/or exponential functions and their equations, graphs or tables.</p>	<p>The student will be able to:</p> <ul style="list-style-type: none"> <li>- Solve problems involving exponential growth and decay in a variety of applications.</li> </ul>	<ul style="list-style-type: none"> <li>• Direct Instruction</li> <li>• Student Note Sheets</li> <li>• Guided Reading Note Sheets</li> <li>• Modeling</li> <li>• Large and Small Groups</li> <li>• Manipulatives</li> <li>• Problem Solving</li> <li>• Critical Thinking</li> <li>• Board work</li> <li>• Inquiry</li> <li>• Drill and Practice</li> <li>• Computers as appropriate</li> <li>• Graphing Calculators as appropriate</li> </ul>	<p>Teacher Observation</p> <p>Worksheet</p> <p>Student Text</p> <p>Assessment Pages</p> <p>Testing Written / Oral</p> <p>Performance Task</p> <p>Math Notebooks</p>

College Board Alignment	Benchmark Standards	Content Standards	Suggested Strategies and Activities	Assessment
2.11	<p>E. Estimate areas under curves using sequences of areas.</p> <p><b>M11.B.2.2.3</b> Estimate and/or determine area, perimeter or circumference of simple figures or complex figures.</p>	<p>The student will be able to:</p> <ul style="list-style-type: none"> <li>- Approximate the area under the graph of a nonnegative continuous function by using rectangle approximation methods (RAM).</li> <li>- Interpret the area under a graph as a net accumulation of a rate of change.</li> <li>- Express the area under a curve as a definite integral and as a limit of Riemann sums.</li> <li>- Compute the area under a curve using a numerical integration procedure.</li> <li>- Apply rules for definite integrals and find the average value of a function over a closed interval.</li> <li>- Approximate the definite integral by using the Trapezoidal Rule.</li> </ul>	<ul style="list-style-type: none"> <li>• Direct Instruction</li> <li>• Student Note Sheets</li> <li>• Guided Reading Note Sheets</li> <li>• Modeling</li> <li>• Large and Small Groups</li> <li>• Manipulatives</li> <li>• Problem Solving</li> <li>• Critical Thinking</li> <li>• Board work</li> <li>• Inquiry</li> <li>• Drill and Practice</li> <li>• Computers as appropriate</li> <li>• Graphing Calculators as appropriate</li> </ul>	<p>Teacher Observation</p> <p>Worksheet</p> <p>Student Text</p> <p>Assessment Pages</p> <p>Testing Written / Oral</p> <p>Performance Task</p> <p>Math Notebooks</p>

<b>College Board Alignment</b>	<b>Benchmark Standards</b>	<b>Content Standards</b>	<b>Suggested Strategies and Activities</b>	<b>Assessment</b>
2.11 (cont)	E. Estimate areas under curves using sequences of areas.	<p>The student will be able to:</p> <ul style="list-style-type: none"> <li>- Use integration to calculate areas of regions in a plane.</li> <li>- Use integration by slices to calculate volumes of solids.</li> </ul>	<ul style="list-style-type: none"> <li>• Direct Instruction</li> <li>• Student Note Sheets</li> <li>• Guided Reading Note Sheets</li> <li>• Modeling</li> <li>• Large and Small Groups</li> <li>• Manipulatives</li> <li>• Problem Solving</li> <li>• Critical Thinking</li> <li>• Board work</li> <li>• Inquiry</li> <li>• Drill and Practice</li> <li>• Computers as appropriate</li> <li>• Graphing Calculators as appropriate</li> </ul>	<p>Teacher Observation</p> <p>Worksheet</p> <p>Student Text</p> <p>Assessment Pages</p> <p>Testing Written / Oral</p> <p>Performance Task</p> <p>Math Notebooks</p>