

Planned Course: Calculus I Unit: Applications of Differentiation Estimated Time: 36 days		Course Number: M311 Grade Level: 11-12 Level/Track:		Department: Math Date Approved: 7/15/08	
PA Academic Standards	Core Concepts (in question format) • Skills/Knowledge	Activities/Strategies/Study Skills (identify some activities as remedial or enrichment activities)	Assessments (include types and topics)		
2.11.11 Concepts of Calculus A. Determine maximum and minimum values of a function over a specified interval.	<ul style="list-style-type: none"> <li>▶ Can the students find extrema on an open interval?</li> <li>▶ Can the students find relative extrema on an open interval?</li> <li>▶ Can the students find critical numbers?</li> <li>▶ Can the students find extrema, absolute and relative, on a closed interval?</li> <li>▶ Can the students find the value of the derivative (if it exists) at the critical points?</li> </ul>	<ul style="list-style-type: none"> <li>– Warm up exercise</li> <li>– Overhead transparencies</li> <li>– Exercises in book</li> <li>– Worksheets</li> <li>– Graphing Calculator</li> <li>– Technology</li> </ul>	<ul style="list-style-type: none"> <li>• Quizzes</li> <li>• Tests</li> <li>• Homework</li> <li>• Graded assignments</li> <li>• Classroom participation</li> <li>• Questioning</li> <li>• Observation</li> </ul>		
2.5.11 Mathematical Problem Solving and Communication 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.	<ul style="list-style-type: none"> <li>▶ Can the students apply Rolle's Theorem?</li> <li>▶ Can the students apply the Mean Value Theorem to a function on an indicated interval?</li> <li>▶ Can the students apply both theorems to practical problems?</li> </ul>				

Planned Course: Calculus I Unit: Applications of Differentiation Estimated Time: 36 days		Course Number: M311 Grade Level: 11-12 Level/Track:		Department: Math Date Approved: 7/15/08	
PA Academic Standards	Core Concepts (in question format) • Skills/Knowledge	Activities/Strategies/Study Skills (identify some activities as remedial or enrichment activities)	Assessments (include types and topics)		
<p>2.5.11 Mathematical Problem Solving and Communication</p> <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>2.11.11 Concepts of Calculus</p> <p>B. Interpret maximum and minimum values in problem situations.</p>	<p>▶ Can the students determine the intervals on which a function is increasing or decreasing?</p> <p>▶ Can the students determine relative extrema using the First Derivative Test?</p> <p>▶ Can the students apply increasing or decreasing intervals and the First Derivative Test to solving real world problems?</p>	<ul style="list-style-type: none"> <li>– Warm up exercise</li> <li>– Overhead transparencies</li> <li>– Exercises in book</li> <li>– Worksheets</li> <li>– Graphing Calculator</li> <li>– Technology</li> </ul>	<ul style="list-style-type: none"> <li>• Quizzes</li> <li>• Tests</li> <li>• Homework</li> <li>• Graded assignments</li> <li>• Classroom participation</li> <li>• Questioning</li> <li>• Observation</li> </ul>		
<p>2.5.11 Mathematical Problem Solving and Communication</p> <p>B. Use symbols, mathematical terminology, standard notation, mathematical rules, graphing and other types of mathematical representations to communicate observations, predictions, concepts, procedures, generalizations, ideas and results.</p> <p>2.11.11 Concepts of Calculus</p>	<p>▶ Can the students determine the intervals in which a graph is concave upward or downward (concavity)?</p> <p>▶ Can the students determine points of inflection?</p> <p>▶ Can the students determine relative extrema using the Second Derivative Test?</p> <p>▶ Can the students solve real world problems using the Second Derivative Test for extrema?</p>				

<b>Planned Course:</b> Calculus I	<b>Course Number:</b> M311	<b>Department:</b> Math	
<b>Unit:</b> Applications of Differentiation	<b>Grade Level:</b> 11-12	<b>Date Approved:</b> 7/15/08	
<b>Estimated Time:</b> 36 days	<b>Level/Track:</b>		
PA Academic Standards	Core Concepts (in question format) <ul style="list-style-type: none"> <li>Skills/Knowledge</li> </ul>	Activities/Strategies/Study Skills (identify some activities as remedial or enrichment activities)	Assessments (include types and topics)

B. Interpret maximum and minimum values in problem situations.			
2.2.11 Computation and Estimation F. Demonstrate skills for using computer spreadsheets and scientific and graphing calculators.	<ul style="list-style-type: none"> <li>▶ Can the students evaluate a limit at infinity?</li> <li>▶ Can the students find horizontal asymptotes?</li> <li>▶ Can the students sketch a graph using symmetry, intercepts and asymptotes?</li> <li>▶ Can the students find quickly the limit at infinity for three types of rational functions?</li> <li>▶ Can the students sketch the graph of a rational function?</li> <li>▶ Can the students sketch the graph of a rational function with a slant asymptote?</li> <li>▶ Can the students sketch the graph of a given function (rational, radical, cube roots, polynomial, and trigonometric) and label intercepts, relative extrema,</li> </ul>	<ul style="list-style-type: none"> <li>– Warm up exercise</li> <li>– Overhead transparencies</li> <li>– Exercises in book</li> <li>– Worksheets</li> <li>– Graphing Calculator</li> <li>– Technology</li> </ul>	<ul style="list-style-type: none"> <li>• Quizzes</li> <li>• Tests</li> <li>• Homework</li> <li>• Graded assignments</li> <li>• Classroom participation</li> <li>• Questioning</li> <li>• Observation</li> </ul>

Planned Course: Calculus I Unit: Applications of Differentiation Estimated Time: 36 days		Course Number: M311 Grade Level: 11-12 Level/Track:		Department: Math Date Approved: 7/15/08	
PA Academic Standards	▶ Core Concepts (in question format) • Skills/Knowledge	Activities/Strategies/Study Skills (identify some activities as remedial or enrichment activities)	Assessments (include types and topics)		
	points of inflection, and asymptotes?				
2.2.11 Computation and Estimation A. Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.  2.11.11 Concepts of Calculus B. Interpret maximum and minimum values in problem situations.	▶ Can the students solve applied minimum and maximum problems?				
2.5.11 Mathematical Problem Solving and Communication 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. 2.2.11 Computation and Estimation A. Develop and use computation concepts, operations and procedures	▶ Can the students find marginals?  ▶ Can the students solve business and economics problems for maximum and minimum revenue, cost, and profit?	<ul style="list-style-type: none"> <li>– Warm up exercise</li> <li>– Overhead transparencies</li> <li>– Exercises in book</li> <li>– Worksheets</li> <li>– Graphing Calculator</li> <li>– Technology</li> </ul>	<ul style="list-style-type: none"> <li>• Quizzes</li> <li>• Tests</li> <li>• Homework</li> <li>• Graded assignments</li> <li>• Classroom participation</li> <li>• Questioning</li> <li>• Observation</li> </ul>		

<b>Planned Course: Calculus I</b>		<b>Course Number: M311</b>		<b>Department: Math</b>	
<b>Unit: Applications of Differentiation</b>		<b>Grade Level: 11-12</b>			
<b>Estimated Time: 36 days</b>		<b>Level/Track:</b>		<b>Date Approved: 7/15/08</b>	
<b>PA Academic Standards</b>	<b>▶ Core Concepts (in question format)</b> • Skills/Knowledge	<b>Activities/Strategies/Study Skills</b> (identify some activities as remedial or enrichment activities)	<b>Assessments</b> (include types and topics)		
with real numbers in problem-solving situations.  2.11.11 Concepts of Calculus B. Interpret maximum and minimum values in problem situations.					