

Planned Course: Calculus Unit: Differentiation Estimated Time: 8 ½ weeks		Course Number: M311 Grade Level: 10-12 Level/Track: college		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>2.11.8.B Describe the concept of unit rate, ratio, and slope in the context of rate of change.</p> <p>2.8.11.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>Can the students find the derivative using the algebra skills to rewrite the function and apply the rules of differentiation?</p> <ul style="list-style-type: none"> • SWBAT differentiate a function involving a radical. • SWBAT find the derivatives involving sines and cosines. • SWBAT use the derivative to find the slope of a curve. • SWBAT use the derivative to find velocity and acceleration. • SWBAT find the derivative using the product rule and quotient rules. • SWBAT find the derivative using rewriting before 	<ul style="list-style-type: none"> • Use the limit process and the slope of the secant line to derive a process for finding the slope of the tangent line. • Have students look at various curves and identify where it fails to have a unique tangent line. • Use a graphing utility to verify the hand calculated derivatives of polynomial, rational and trigonometric functions. • Have students create a substitute lesson plan which explains the derivative, discusses average rate of change vs. instantaneous rate of change, the tangent line problem and how the derivative was derived. 	<ul style="list-style-type: none"> • Quizzes • Tests • Homework • Graded assignments • Classroom participation • Questioning • Observation 		

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	<p>applying the product or quotient rules.</p> <ul style="list-style-type: none"> • SWBAT differentiate quotients with the constant multiple rule. • SWBAT use the power rule for negative integers. • SWBAT use the derivative rules for the tangent, cotangent, secant, and cosecant functions. • SWBAT obtain the simplified form of a derivative after differentiating. • SWBAT find the derivative using the Chain Rule. • SWBAT find the derivative applying the general power rule. • SWBAT use the power 	<ul style="list-style-type: none"> • Use the graphing calculator to graphically and numerically examine the behavior of a rational function, investigating limits in general and methods for computing limits. • Use limits to define the concept of continuity of a function at a point in its domain. • Use the graphing calculator to graphically, numerically and analytically verify a function's continuity or discontinuity. • Use algebra techniques to verify the answers that are found using the graphing calculator 	
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	<p>rule for rational exponents, radical functions, and constant numerators.</p> <ul style="list-style-type: none"> • SWBAT use implicit differentiation to find the derivative of an equation. • SWBAT find the slope of a curve implicitly. • SWBAT find the tangent line to a graph using implicit differentiation? • SWBAT find the indicated values of dy/dt and dx/dt when x and y are both differentiable functions of t. • SWBAT solve related rate problems. 		
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