CALCULUS I
GRADE LEVEL 12

#	Lesson	Lesson Content
1	Limits	Calculating x-values and corresponding values, approaching function values, limits, and notation
2	Continuous Functions	Definition of continuous function, continuous graphs of polynomial functions, sine and cosine, evaluating the limits of continuous functions
3	Discontinuous Functions 1	Examining various types of discontinuities: holes, asymptotes, and jumps and their graphs
4	Discontinuous Functions 2	Approaching negative and positive infinities
5	Discontinuous Functions 3	One-sided limits
6	Special Trig Functions	Trigonometric limits of sine and cosine functions, graphing tangents, cotangents, secants, cosecants
7	Limits at Infinity	Polynomials as they approach infinity, negative infinity, and infinity squared, definition of infinity squared, examples of how changing the argument of the function changes the limit
8	Limit Unit Review	Review of limit lessons
9	Derivatives	Derivatives and determining the slope of a tangent at a given point, using the derivative as a velocity, the derivative as a function, Liebniz notation
10	Derivative Shortcuts 1	Using the mathematical definition of a derivative to find general pattern, constant functions and derivatives; the Power Rule and coefficients of sums and differences
11	Derivative Shortcuts 2	Negative exponents, derivatives of sine and cosine, derivatives at specific points
12	Some Derivative Rules	Functions that are products, the Product Rule, rational functions and the Quotient Rule, the derivative as a reciprocal of sine
13	The Chain Rule	Derivatives of composite functions, definition of the Chain Rule, extending the Chain Rule
14	Higher Derivatives	Acceleration as a derivative of velocity, notation and use of higher derivatives
15	Implicit Differentiation	Examples of finding the derivative implicitly without solving for y
16	Derivative Unit Review	Review of derivatives
17	Maximum/Minimum Values 1	Determining maximum and minimum values of given functions on closed intervals
18	Maximum/Minimum Values 2	Using zero-slope to determine maximum and minimum values, critical points and relative extrema
19	Maximum/Minimum Tests 1	The first derivative tests, increasing and decreasing slopes, finding relative extrema
20	Maximum/Minimum Tests 2	Second derivative tests, finding relative extrema
21	The Second Derivative	Concavity and inflection points of graphs, definition and determination of inflection points, sign graphs
22	Application Review 1	Review of maximum and minimum values and tests
23	Applications of Extrema	Determining need to find maximum and minimum values in real life situations
24	Related Rates 1	Problems with derivatives that are related; problems involving related rates and spheres
25	Related Rates 2	Using related rates to determine the volume of cones; using the Pythagorean relationship in related rate problems
26	Graphing Using	Understanding the nature of graphing, determining graphing data

	Extremes 1	
27	Graphing Using Extremes 2	Asymptotes as related to graphs
28	Application Review 2	Review of related rates and graphing
29	Antiderivatives	Determining the original function from the derivative, definition of antiderivatives, proving antiderivatives, antiderivatives with negative exponents
30	Comprehensive Exam	Review of all material presented in Calculus 1