Math 229
Exam 3 - Review Sheet

Sections 4.2 and 4.3 : Exponential and Logarithmic Functions
• Know the definition of an exponential function.
• Know and be able to apply the Laws of Exponents.
• Understand the basic shape of the Graph of an exponential function.
• Know the Properties of Exponential Functions (domain, range, intercept, increasing/decreasing behavior, concavity)
• Know the definition of the natural base, "e".
• Know the definition of a Logarithmic Function.
• Understand how to perform basic computations involving logarithms and be able to translate an logarithm into exponential form.
• Memorize and be able to apply the Laws of Logarithms.
• Know the basic shape and properties of graphs of Logarithmic Functions (domain, range, intercept, increasing/decreasing behavior, concavity).
• Understand the notation: log (base 10), and the natural logarithm: ln (base e).

Sections 4.4, 4.5, and 4.6: Computing and Solving Applications Involving Exponentials and Logarithms
• Be comfortable with the process of using a calculator to evaluate expressions involving logarithms and exponentials.
• Understand the Change of Base Formula and be able to use it in order to compute values of logarithms with any base.
• Be able to solve equations involving exponentials and logarithms.
• Be able to solve application problems where the model used involves an exponential function and/or a logarithmic function.
• Memorize and be able to apply both Compound Interest Formula and the Continuous growth/decay formula.

Section 12.4: Differentiation of Exponential Functions
• Memorize and be able to apply the basic differentiation formula for Exponential Functions.
• Understand and be able to apply the Chain Rule for Exponential functions and be able to combine this with other differentiation rules.

Section 12.5: Differentiation of Logarithmic Functions
• Memorize and be able to apply the basic differentiation formula for the Natural Logarithm Function.
• Understand and be able to apply the Chain Rule for Logarithmic Functions and be able to combine this with other differentiation rules.
• Be able to solve application problems involving the derivatives Exponential and Logarithmic functions (finding tangent lines, increasing/decreasing intervals, concavity, absolute extrema, and inflection points)

Section 15.1 and 15.2: Antiderivatives and the Rules of Integration, Integration by Substitution
• Know the definition of an the antiderivative of a function.
• Be able to evaluate Indefinite Integrals by applying integration rules.
• Be able to solve Initial Value Problems.
• Be able to solve application problems involving antidifferentiation and initial values.
• Be able to evaluate Indefinite Integrals by applying the method of substitution.

Section 15.3 and 15.4: The Definite Integral and the Fundamental Theorem of Calculus
• Understand how to approximate the area under a function using rectangles.
• Memorize the Statement of the FTC and be able to apply it in order to finding the area under a curve by evaluating a definite integral.
• Be able to solve applications involving velocity and marginal functions using definite integrals.
• Memorize and be able to apply the properties of definite integrals.
• Be able to find the average value of a function on a closed interval.

Section 15.5: The Area Between Two Curves
• Know the basic method for finding the area between two functions.
• Understand how to use definite integrals to find the Area of regions under the graph of a function or enclosed by the graphs of more than one function.
• Understand how to split into more than one integral if the graphs of the functions involved cross at one or more points.