TOPICS and Concepts for the Math 121 Advancement Exam

NOTE:

- A scientific calculator similar to a **TI-36X** Pro can be used on the test. A cell phone, translator, dictionary, or similar device is never allowed.
- NO formulas will be given
- The problems on the "Samples" exam contain similar to but not exactly like, problems on the actual Advancement Exam. Further, the Advancement Exam may contain problems that are not expressly shown on the "Samples Exam".

The Advancement Exam for Math 121 may include but will not be limited to the following types of problems:
1. Interpret and evaluate limits of algebraic, exponential, and logarithmic functions
2. Determine the continuity of functions at specific points and in an entire set
3. Calculate derivatives of algebraic, exponential, and logarithmic functions, applying various rules of derivatives
4. Analyze and sketch polynomial and rational functions using the first and second derivative
5. Apply derivatives to solve optimization problems with or without constraints
6. Apply derivatives of exponential and logarithmic functions to solve business and life science applications

7. Apply derivatives and integrals to problems relating to business, economics, natural science, and social science
8. Calculate antiderivatives of functions involving algebraic, exponential, or logarithmic functions
9. Calculate antiderivatives using the substitution technique
10. Compute definite integrals by applying the Fundamental Theorem of Calculus, and apply definite integrals to find the area under a curve and between two curves
11. Calculate derivatives of multivariable functions and apply them to maximization and minimization problems