Math 2A Final Exam Review Guide

TOPICS COVERED: The common final exam will cover material from sections 2.1–2.3, 2.5–2.8, 3.1–6, 3.8–3.10, 4.1–4.5, 4.7 and 4.9 in the 8th Edition of "Calculus: Early Transcendentals" by James Stewart. (Note: Chapter 1 is covered in your class. This contained preliminary review material, and questions on the exam may assume those skills, but no questions will be specifically asked on those sections.) In all sections, the suggested homework give a good indication of the scope of the material covered in each section and the types of questions which might appear on the final exam. All questions will be designed to be done without a calculator.

EXAM FORMAT: In general for the exam, it is expected that students show work for every problem, unless otherwise noted. The exam will include explicit directions on how much each answer must be simplified. Clearly indicate your final answer for each problem. Points may be lost for incorrect notation and work that does not support your final answer. The directions for each problem are written as closely as possible to directions given on the homework problems from the text. The exam problems will be of varying difficulty levels. The point value of each problem will be indicated.

EXAM MATERIALS: All students will need to bring a pencil and photo ID to the exam. Students without a readable photo ID will not be allowed to take the exam. All needed paper will be supplied. For the exam, students may not use calculators, cell phones, notes, texts, or any other form of assistance. These objects must be put away in a book bag and may not be accessed at any time during the exam (for example, you cannot check the time on a cell phone.)

STUDY MATERIALS: There are numerous study materials available to help you prepare for the final exam in this course. The textbook has excellent chapter review problems. On the UCI calculus website there are sample midterms and final exams. You can use these to give yourself timed practice exams. Note that the sample exams are not meant to be a comprehensive review of all the material that might appear on the final exam. Finally, the text and your lecture notes are another excellent source of review materials.

FORMULAS TO KNOW: On the exam, no formulas will be provided. When dealing with the problems, you may find it useful to know some basic algebra rules, basic trigonometry identities, some standard derivative rules, and some simple geometry rules. Below is a list of the formulas which final exam questions may require you to utilize.

Algebra:
- solving linear, quadratic and simple higher order polynomial equations
- exponent rules
- equation of a line, slope formula

Trigonometry:
- Values of sine, cosine and tangent for important angles
- The relationship of the six trig functions to a right triangle
- Expressions for cosecant, secant, tangent and cotangent in terms of sines and cosines

- The following basic trig identities

$$\sin^2\theta + \cos^2\theta = 1 \qquad 1 + \tan^2\theta = \sec^2\theta$$
$$\cos^2\theta = \frac{1}{2}(1 + \cos 2\theta) \qquad \sin^2\theta = \frac{1}{2}(1 - \cos 2\theta)$$
$$\sin 2\theta = 2\sin\theta\cos\theta$$

- The graphs of the sine, cosine, and tangent functions

Derivative Rules:
- basic derivative rules including power, product, quotient and chain rules
- definition of the derivative
- derivatives of all six basic trig functions
- derivatives of exponential and logarithmic functions
- derivatives of inverse sine and inverse tangent functions
- know any theorems with an actual name (ex. IVT, MVT, EVT, Rolle's)

Geometry:
- Area of triangle, square, rectangle and circle
- Volume of a box, sphere and cylinder
- Surface area of box, sphere and cylinder

Not Required:
- A calculator is not allowed, and the exam will be written such that one is not required
- No problems will explicitly be from Chapter 1
- The rigorous definition (i.e., ε-δ) of limit and continuity will not be on the exam
- You will not be required to have the limit laws on pages 99-101 memorized by number, but do know how to use them in a problem (i.e., you will not be asked to calculate a limit and justify each step with a limit law number)