

Math 2B Final Exam Review Guide

TOPICS COVERED: The common final exam will cover material from sections 4.9, 5.1–5.5, 6.1, 6.2, 6.5, 7.1–7.5, 7.8 and 11.1–11.10 in the 8th Edition of “Calculus: Early Transcendentals” by James Stewart. 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 and without access to any sort of table of integrals.

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 problem 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. For many of the questions, you should not expect to be told what integration method to use, but rather have to figure that out yourself and similarly for series convergence tests. 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. Section 7.5 is a good review of all the integration methods. On the UCI calculus website there are practice 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, reading 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 various forms of derivatives and integrals, you may find it useful to know some basic algebra rules, basic trigonometry identities, some standard derivative and integral rules, and some simple geometry rules. Below is a list of formulas which final exam questions may require you to utilize. Note: This is just a list of formulas to know, not a list of all the topics and techniques in the course and not a list of all the things needed for the final exam. Refer to the covered sections of the text for that information.

Algebra:

- laws of exponents and logarithms
- partial fractions decomposition formats

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

$$\sin^2\theta + \cos^2\theta = 1 \quad 1 + \tan^2\theta = \sec^2\theta$$

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

$$\sin 2\theta = 2 \sin \theta \cos \theta$$

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

Derivatives and Integrals:

- basic derivative rules including power, product, quotient and chain rules
- derivatives and integrals of basic functions
- any important theorems from the course, such as the Fundamental Theorem of Calculus
- strategy for evaluating trigonometric integrals
- how to select trigonometric substitution

Geometry:

- Area of triangle, square, rectangle and circle
- Volume of a cylinder and washer for volumes by revolution problems

Sequences and Series:

- All the methods for testing sequence and series convergence
- Geometric series formula
- General formula for computing Taylor series

Not Required:

- Computation of a definite integral using its definition (as limit of Riemann Sums)
- A calculator is not allowed, and the exam will be written such that one is not required
- Sec. 7.2 Trig integrals involving sin/cos sum/difference formulas are not required
- Sec. 7.3 Trig substitutions involving completing the square is not required
- Sec. 7.4 Partial fractions involving repeated irreducible quadratics is not required
- Sec. 7.8 Comparison test for Improper Integrals is not required
- Sec. 11.3 Remainder estimate for the integral test is not required
- Nothing involving cosh or sinh will appear on the final exam.