

LIST OF TOPICS FOR MATH 20B: FINAL EXAM

- You must bring a Blue Book in which to write your exam.
- Please bring your UCSD student ID to the exam and expect it will be checked.
- You may bring one 8.5" \times 11" sheet of *handwritten* notes (front and back) to the exam.
- No calculators or other electronic devices!!

The exam will be based on the homework questions and lecture material, including all examples presented in class. To help guide your studying, make sure you are familiar with the following topics:

TOPICS

1. Computing definite and indefinite integrals.
2. Techniques of integration:
 - (a) Method of Substitution
 - (b) Integration by Parts
 - (c) Partial Fractions
 - (d) Trigonometric Substitution
3. Computing trigonometric integrals
4. Computing the area between curves.
5. Finding volumes using the "slicing" technique.
6. Finding the volume of a solid of revolution (using the "disk method" and the "washer method").
7. Finding the area of a region described by a polar curve or curves.
8. Complex numbers:
 - (a) Polar form of a complex number
 - (b) De Moivre's Formula and Euler's Formula
 - (c) Finding n^{th} powers and n^{th} roots of real and complex numbers.
 - (d) Complex exponentials
 - (e) Integration using complex exponentials.
9. Improper integrals (Section 7.6)
 - (a) Determining whether an improper integral converges or diverges.
 - (b) Computing improper integrals using the limit definition.

10. Convergence of series:

- (a) Divergence Test
- (b) Integral Test
- (c) Comparison Test
- (d) Limit Comparison Test
- (e) Alternating Series Test (Leibniz Test)
- (f) Ratio Test
- (g) Root Test

11. Absolute convergence versus conditional convergence.

12. Finding the Radius of Convergence and Interval of Convergence for a power series.

13. Finding the Taylor series representation of a function.

The final exam tests all material covered in class. Some topics that do not appear on this list form the basis for later topics that do appear on this list; consequently, understanding of these preliminary topics is essential to success on the final exam.