

What you need to know for the Final Exam

The Final Exam will cover the entire course. So you should know everything you needed to know for Exams 1–3, **plus** you should know Sections 10.3 and 10.4, on polar coordinates, and area in polar coordinates. This handout, which you should use in combination with the review sheets for Exams 1–3, lists the relevant topics.

Same policy on “cheat sheets” as on Midterms 2 and 3, i.e.:

You may bring one standard size (8.5x11”) “cheat sheet” of notes to the exam

No worked-out problems are allowed on your cheat sheet.

You must hand-write your own cheat sheet on the paper itself. No printouts.

At the end, you must hand in your cheat-sheet with your exam paper.

ALSO: With your exam, I will provide you with a fresh copy of the two-page “Summary of Convergence Tests” handout (from both class and on the website). So you may reserve your cheat sheet for other things, like tips and notes for how best to use those tests.

Remember, no calculators in any exams.

- **Transcendental and Inverse Functions, and L’Hôpital:**

- Exponentials and Logarithms (Section 6.1–6.4) (Review)
- Inverse Trigonometric Functions (Section 6.6)
- L’Hôpital’s Rule and Indeterminate Forms (Section 6.8), including:
 - * $\frac{0}{0}, \frac{\infty}{\infty}, \frac{-\infty}{\infty}, \frac{\infty}{-\infty}, \frac{-\infty}{-\infty}$
 - * $0 \cdot \infty$
 - * $0^0, \infty^0, 1^\infty$

- **Integration Methods:**

- Integration by Substitution (Review)
- Integration by Parts (Section 7.1)
- Trigonometric Integrals (Section 7.2)
- Trigonometric Substitution, including Completing the Square (Section 7.3)
- Partial Fractions (Section 7.4)
- Integration Strategies (Section 7.5)
- Improper Integrals (Section 7.8)

- **Sequences and Series:**

- Sequences (Section 11.1) and Introduction to Series (Section 11.2)
- Geometric Series Test and n^{th} Term Divergence Test (Section 11.3)
- Integral Test and p -Series Test (Section 11.3)
- Comparison and Limit Comparison Test (Section 11.4)
- Alternating Series (Section 11.5)
- Absolute and Conditional Convergence, Ratio Test (Section 11.6)
- Series Testing Strategy (Section 11.7)
- Power Series, Interval/Radius of Convergence (Section 11.8)
- Representing Functions as Power Series (Section 11.9)
- Taylor and MacLaurin Series (Section 11.10), including:
 - * New series via derivatives
 - * New series via integrals
 - * Computing sums of specific series
 - * Limits via power series instead of L'Hôpital
 - * Estimating sums via the Alternating Series Estimation Theorem

- **Polar Coordinates:**

- Introduction to Polar Coordinates (Section 10.3)
- Using Cartesian Plots to Sketch Polar curves.
- Sketching Circles and Cardioids
- Area with Polar Coordinates (Section 10.4)