

FINAL EXAM SYLLABUS

Final Exam: Wednesday, December 17th, 9am, Sewall Hall 301

No notes, books or calculators are allowed during the exam. However, you will be allowed to write on both sides of an index card (3"x5") and bring the card with you during the exam. The card has to be handwritten by yourself.

List of topics:

1. Domain and range of a function
2. Trigonometric functions
3. Existence of limits and limit computations
4. Continuity. Intermediate Value Property
5. Function compositions ($f \circ g$)
6. The definition of the derivative of a function
7. Differentiation with the power/product/quotient/chain rule.
8. Critical points. Maxima and minima of functions on closed intervals.
9. Max/min applied problems (word problems where you are asked for the minimal cost, maximal volume, etc)
10. Exponential and logarithmic functions(graphs, laws of exponential and logarithms, identities, derivatives)
11. Logarithmic differentiation
12. Implicit differentiation and related rates
13. Linear approximation
14. Rolle's Theorem and the Mean Value Theorem
15. Increasing and decreasing functions and the relation with the first derivative
16. The first derivative test for local/global extrema
17. The second derivative and concavity. The second derivative test.
18. Curve sketching (x, y -intercepts, critical points, intervals of increase and decrease, inflection points, behavior at $\pm\infty$, asymptotes)
19. The indeterminate forms $\frac{0}{0}$ and $\frac{\infty}{\infty}$ and L'Hopital's rule
20. The indeterminate forms $0 \cdot \infty$, $\infty - \infty$, 0^0 , 1^∞ , ∞^0