

The exam is cumulative, potentially covering all the material we have explored this semester, including labs. In particular, the exam will focus on the following topics:

- Derivatives, local linear approximations, higher order (Taylor) approximations, estimating the absolute error in Taylor approximations
- FTC: Areas and antiderivatives, functions defined by integrals
- Using inscribed and circumscribed rectangles to approximate integrals, and using integrals to approximate sums
- Inverses in the integers modulo n , Euler's ϕ -function, applications to crypto
- L'Hospital's rule
- Definition of irrational powers, using the definition of the natural logarithm and exponential function
- Convergence/divergence of sequences and series
- Integration techniques: improper integrals and integration by parts
- Differential equations: expressing a proportionality relationship as a differential equation, qualitative analysis of diff. eq.
- Taylor series and power series, interval of convergence, obtaining new power series from known ones

Other miscellany:

- The exam has 10 problems, each worth 10 points, plus a couple of challenge problems, worth a total of 15 bonus points.
- You may use a scientific calculator but not a graphing calculator.
- You may use one page of notes, which you will need to turn in with your exam. What you include on your one page of notes is up to you.