

Engineering and Science Mathematics 1A

Review for Final Exam

Exam date: Monday, December 13, 2010 from 12:30–14:30

1. Limits, one-sided limits. Like on the first midterm exam. L'Hôpital's rule or Taylor series might help, but are not essential if you know the basic trigonometric limits.
2. Continuity: When is a function continuous, can a discontinuous function be extended to be continuous? Intermediate value property.
3. Derivative: Definition, differentiation rules, be able to compute a Taylor polynomial of a given function.
4. Applied minimax problems.
5. Curve sketching: Domain and range of a function, horizontal and vertical asymptotes. Finding critical points: when does a critical point correspond to a minimum, when to a maximum? Concavity, Points of inflection.
6. Implicit differentiation, error propagation.
7. Techniques of integration. The exam problems will be taken from among the *Miscellaneous Problems* from the chapter "Techniques of Integration" in Edwards & Penney.
8. Improper integrals. Problems will be taken from the excises of the corresponding section in Edwards & Penney. (See scan of the Homework 8 assignment.)
9. Find the area under a graph; find volume, surface area via integration.
10. Differential Equations: be able to solve a separable first order differential equation. Look particularly at the models of population growth.
11. Series: Geometric series, harmonic series; test convergence via the integral test or comparison test. (There are a few more important tests which we did not cover in class, so those will not be on the exam.) Taylor series.

Exam rules:

- No notes and calculators.
- Paper will be supplied.
- Respect the Code of Academic Integrity. It will be enforced.