

This is an overview of the most important skills and understanding I expect you to have developed.
I don't promise that every exam problem will match with something on this sheet.

Exam questions might test your understanding of some of the following important terms and concepts:

summation notation antiderivative
indefinite integral definite integral
The Fundamental Theorem of Calculus

The exam might reasonably test your ability to carry out some of the following procedures.

- Use l'Hôpital's Rule (perhaps more than once) to evaluate a limit. Specifically, use l'Hôpital's Rule directly on one of the indeterminate forms $\frac{0}{0}$ or $\frac{\infty}{\infty}$ or rewrite a limit of indeterminate form $0 \cdot \infty$, $\infty - \infty$, 0^0 , 1^∞ or ∞^0 as a limit of indeterminate form $\frac{0}{0}$ or $\frac{\infty}{\infty}$, then use l'Hôpital's. You might not be told what indeterminate form is given and you might be asked to identify what indeterminate form is given.
- Compute an indefinite integral by finding an antiderivative. (This is a pretty general question, and includes some of the later questions.)
- Approximate* a definite integral as a right Riemann sum.
- Compute* a definite integral by computing (positive and negative) areas directly.
- Compute* a definite integral using the basic properties of definite integrals.
- Compute a derivative using the Fundamental Theorem of Calculus (Part 1).
- Compute* a definite integral using the Fundamental Theorem of Calculus (Part 2). (Again, this is a pretty general question, and includes some of the later questions.)
- Compute an integral (indefinite or definite) using basic derivative facts**.
- Compute an integral (indefinite or definite) using substitution**.
- Compute an integral (indefinite or definite) using integration by parts**.

*In all of these problems, please make sure you know whether you are being asked to compute or to approximate a definite integral.

**You might not be told whether substitution, parts, or neither is needed.

I may ask a few challenge questions at the end of the exam, worth very few points, and these problems are exempt from anything I have told you or will tell you about what I will or will not ask on the test.

Closed book, closed notes, no calculators.

The following additional types of problems will *not* be on Test 3, but will be on the final:

- Find the area bounded by given curves.
- Find the volume of a solid of revolution using one of the following methods:
 - the "discs" method.
 - the "washers" method.
 - the "shells" method.

You might not be told which of the three methods to use.