Integration Review

Critically important: You absolutely must be able to do the following types of problems in order to succeed in this course. If you are unsure of any of these, you should study the appropriate sections in your text immediately. If you are still confused after reviewing the text, come to office hours and we'll be sure to get things cleared up.

1. Writing out the (summation) definition of the definite integral of a function f from point a to point b, $\int_a^b f(x)\,dx$, and describing the meaning of each term in the definition.

2. Finding basic antiderivatives: $\int \cos(x) + (x^3 - x^5)^2\,dx$

3. Calculating definite integrals: $\int_1^3 x^2\,dx$

4. Finding antiderivatives using substitution (Section 5.5): $\int x^2 2^{x^3}\,dx$

5. Finding antiderivatives by parts (Section 6.1): $\int x^2 e^{-x}\,dx$

6. *Finding antiderivatives of trig functions (Section 6.2): $\int \tan^3 x \sec x\,dx$

7. *Finding antiderivatives using trig substitution (Section 6.2): $\int \frac{\sqrt{x^2 - 9}}{x^3}\,dx$

Please resist the urge to splinter a compound integral such as in problem 2 into a bunch of separate calculations, whose values you recombine at the end of the problem. A good integration problem write-up (or really, a good problem write-up of any kind) has only one single flow of logic, and one path of equal signs, to follow! Ask me if you do not understand what I am talking about here.