Mathematics 136 – Advanced Placement Calculus
Practice with the Table of Integrals
October 28, 2009

Background and Example Problem

In many cases, using the table of integrals effectively involves both

- Recognizing which table entry might apply from the form of the function, *and*
- Making a preliminary *u-substitution* to put the integral you want into the form given in the table entry. Today we want to practice recognizing which forms apply and doing the necessary substitutions.

Discussion Problems

A) Do a preliminary substitution based on the form and integrate by the table:

1) $\int \sqrt{7+3e^x}\ dx.$

2) $\int \tan^3(\ln(x))\frac{dx}{x}.$

3) $\int \frac{\sin x}{\cos^2 x + 6\cos x + 10}\ dx.$
(Hint: Either before or after you substitute, you will also want to complete the square on the bottom.)

4) $\int x^{3/2}e^{x^{1/2}}\ dx.$

B) Each of the integrals below looks very much like the others, but they are actually quite different forms. For each, say which method and/or table entries you need, and do the integration:

1) $\int \frac{x}{\sqrt{9-x^4}}\ dx$

2) $\int \frac{x}{\sqrt{9-x^2}}\ dx$

3) $\int \frac{1}{x\sqrt{9-x^2}}\ dx$