Math 266B **Winter 2006** **Guide for Test 2**

The second test is in class on Friday 3 February.

Here are some sample questions, so that you have an idea of what to expect.

You can use the following table of integrals for any of the questions:

- $\displaystyle\int \frac{1}{\sqrt{x^2 \pm a^2}}\,dx = \ln|x + \sqrt{x^2 \pm a^2}| + C$
- $\displaystyle\int \csc(x)\,dx = -\ln|\csc(x) + \cot(x)| + C$

1. (a) $\displaystyle\int_0^3 \frac{1}{\sqrt{x}}dx \;=$

   (b) $\displaystyle\int_3^\infty \frac{1}{\sqrt{x}}\,dx \;=$

   (c) $\displaystyle\int_3^\infty \frac{1}{x^2}\,dx \;=$

   (d) $\displaystyle\int_3^\pi \frac{9}{\sqrt{x^2-4}}dx \;=$

   (e) $\displaystyle\int xe^{-3x}dx \;=$

2. (a) $\displaystyle\int \frac{5}{x^2+x-2}\,dx \;=$

   (b) $\displaystyle\int 7x^2\csc(x^3)\,dx \;=$

   (c) $\displaystyle\int \frac{x\ln(1+x^2)}{1+x^2}\,dx \;=$

   (d) $\displaystyle\int_1^4 (x-2)^{-1/3}\,dx \;=$

3. (a) Find the Taylor approximation of degree $n = 3$ about $a = 1$ for the function $f(x) = \ln(x)$.

   (b) Use your Taylor approximation to estimate the value of $\ln(2)$.

   (c) Use Taylor's formula to bound the difference between your estimate and the true value $\ln(2)$.