Calculus III Honors Spring 2010
Final Review Questions

Instructions: While you may not have to show your work for every problem on the actual exam, you will for many problems, so you should be able to show your work for all of these problems. You should also be able to do each of the following on your own without needing to refer to your text or notes (except of course to read the problems from the book).

Part I: Series

Problem A. Using the Maclaurin series for $\frac{1}{1-x}$, derive the Maclaurin series for $f(x) = \ln(1 + x)$ and for $g(x) = \tan^{-1}(x)$. For each series, determine the interval of convergence.

Problem B. Using the Maclaurin series for e^x, find a rational approximation for e^{-1} correct within 3 decimal places.

Problem C. Find indefinite integrals $\int e^{x^3} dx$ and $\int \frac{1}{1+x^8} dx$.

Problem D. Find a rational approximation for $\int_0^1 \cos(x^3) dx$ correct within 4 decimal places.

Section 12.7: 1–12

Section 12.8: 3–8

Section 12 Review (p. 795): 23–28

Part II: Curves and vectors in $\mathbb{R}^2$ and $\mathbb{R}^3$

Section 11.4: 9, 11, 13

Chapter 11 Review (p. 706): 17, 21, 23

Section 13.2: 23

Section 13.3: 17, 23

Section 13.4: 17, 31

Section 13.5: 7 (write vector and parametric equations), 23, 31

Section 14.2: 19, 23, 25

Section 14.3: 1, 3