Math 124 – Fall 04
Additional Practice Problems for the Final Exam.

1. Practice problem fro Exam 1.

2. Practice problem fro Exam 2.

3. Practice problem fro Exam 3.

4. Let $\mathbf{F}(x, y, z) = 2y\,\mathbf{i} + 3x\,\mathbf{j} + (x^3/3 + xy)\,\mathbf{k}$. Compute

$$\oint_C \mathbf{F} \cdot d\mathbf{s},$$

   where C is the curve of intersection of the cylinder $x^2 + y^2 = 1$ and the plane $z + y = 2$ oriented counterclockwise when viewed from above.

5. Compute the flux of the vector field $\mathbf{F}(x, y, z) = (2x, 2y, 2z)$ across all the sides of the cube $0 \leq x \leq 1$, $0 \leq y \leq 1$, $0 \leq z \leq 1$,

6. Let S be the parametric surface given by

$$\mathbf{X}(x, z) = (x, x^3 + z, z),$$

   for $0 \leq x \leq 2$ and $0 \leq z \leq 3$.

   (a) Find the equation of the normal line to surface S at the point (1,2,1).

   (b) Set up an integral to compute the area of the parametric surface S. DO NOT COMPUTE THE INTEGRAL.