Math 53, Spring 2000, sections 107 & 109
Friday of the 13^{th} Quiz Name_____

Instructions: You have 30 minutes in which to answer the questions on BOTH pages of this quiz. No calculators, notes, or other references may be used.

1. (5 points) Let $\mathbf{F}(x, y, z) = ye^{xy}(x\,\mathbf{i} - y\,\mathbf{j} + z\,\mathbf{k})$. Circle ONE of the following two surfaces and evaluate the flux of $\mathbf{F}$ through the surface you have selected.

(a) S_1 is the surface $z = 1$, bounded by the planes $x = 0$, $x = 2$, $y = 0$, and $y = 2$, and oriented upward,

or

(b) S_2 is the sphere of radius 10, oriented outward.

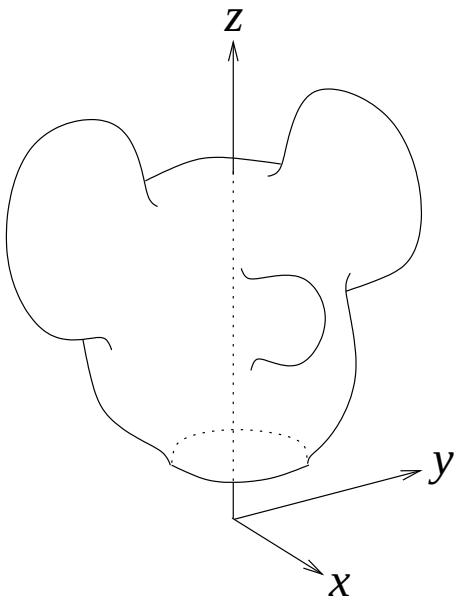

FIGURE 1. A mickiform musculoid

2. (5 points) Let S be the surface shown in Figure 1, with outward orientation and boundary C the circle $x^2 + y^2 = 9, z = 2$. Evaluate the integral $\iint_S \operatorname{curl} \mathbf{F} \cdot d\mathbf{S}$, where $\mathbf{F}(x, y, z) = yz\,\mathbf{i} + 2xz\,\mathbf{j} + 3ze^{sin(x+y)}\,\mathbf{k}$.