**Math 241 C8**

Quiz # 1

January 30, 2013

No electronic devices or interpersonal communication allowed. Show work to get credit.

1) [5pts.] Parametrize the curve $\left(\dfrac{x}{2}\right)^2 + \left(\dfrac{y}{5}\right)^2 = 1$.

2) [5pts.] Find all points on the curve $(x, y) = (t + e^{4t}, 2e^{2t})$ where the slope of the tangent line is 1. (Hint: toward the end, think about $u = e^{2t}$.)

3) Consider the region R in the xy-plane bounded by the curves $y = \sqrt{4 - x^2}$ and $y = x^2 - 2$. Let $f(x, y) = x^2 - y^2 + 2$. Here is a picture of the graph of f above the region R:
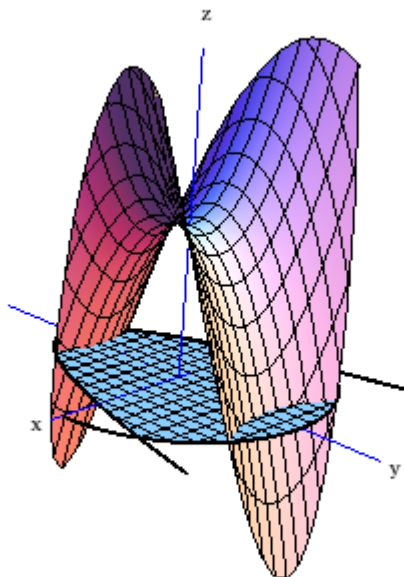
a) [5 pts.] Without performing any computation, is $\iint_R f(x, y)\, dx\, dy$ positive or negative? Explain.

b) [5 pts.] Start to compute $\iint_R f(x, y)\, dx\, dy$. Stop when you have a single integral (there should only be one variable, but you don't need to simplify anything).

c) [bonus] Start to compute $\iint_S f(x, y)\, dx\, dy$, where S is the unit disk in the xy-plane. Again, stop when you have a single integral.