Math 324 Quiz 6

March 3, 2017

Problem 1. Explain why the line integral of $\vec{F}(x, y) = \langle 0, x \rangle$ counter-clockwise around a closed curve C is equal to the area that the curve contains.

Problem 2. Consider the parametric equation

$$\vec{r}(s, t) = \langle \sin(s)\cos(t), 2\sin(s)\sin(t), 3\cos(s) \rangle$$

with $0 \leq s \leq \pi/2$ and $0 \leq t \leq \pi$. Describe the surface parametrized by $\vec{r}(s, t)$ Is it a cone, paraboloid, sphere, ellipsoid, hyperboloid? Is it the whole whatever-oid, or just a part? Which part?

Problem 3. Let S be the surface from the previous problem. Set up (but do not evaluate) an integral in the parameters s and t which calculates the integral of xyz over S.