MATH 251: Practice 24

July 13, 2015

Name: _____

Use Stokes' Theorem to evaluate the integral

$$\iint_{\mathcal{S}} \text{curl}(\vec{F}) \cdot d\vec{S}$$

for the surface $\mathcal{S}$ with outward normal vector and vector field $\vec{F}$ below, where the boundary of $\mathcal{S}$ is the ellipse $4x^2 + y^2 = 16$ in the xy-plane. This boundary can be parametrized as $c(t) = \langle 2\cos(t), 4\sin(t), 0\rangle$, $0 \le t \le 2\pi$.

$$\vec{F} = \langle 3x + 4yz, x + y + z, 3x^2 + 4y\rangle$$