# MATH 251: Quiz 8

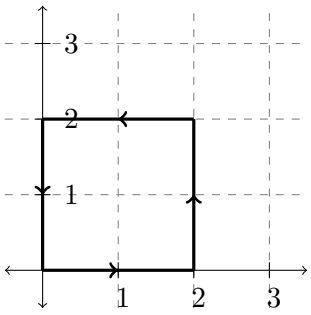
April 30, 2015

Name: _____ Sec: _____

**1.** Use Green's Theorem to calculate the integral $\oint_C \vec{F} \cdot d\vec{s}$ for the vector field

$$\vec{F} = \langle 2xy + x^4, 3xy^2 - \sin(y) \rangle$$

and the curve



**2.** 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 $c(t) = \langle 2\cos(t), 4\sin(t), 0\rangle$.

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