MATH 251: Quiz 6

April 9, 2015

Name: _____ Sec: _____

1. Let $\vec{F} = \langle yz, xz, xy \rangle$. Compute the integral

$$\int_{\mathcal{C}} \vec{F} \cdot ds$$

for the curve $\mathcal{C}(t) = \langle 3t^2 + \cos(\pi t^3), 2^t, t^4 + t^3 - t + 1 \rangle$ for $t = 0$ to 1. Hint: Is $\vec{F}$ conservative?

2. Determine whether or not the following vector fields are conservative. If they are conservative, find a potential function.

(a) $\vec{F} = \langle y^2, x^2, \sin(z) \rangle$.

(b) $\vec{G} = \langle 3x^2 + \sin(z), 2yz, y^2 + x\cos(z) \rangle$.

3. Let $f(x, y, z) = 9z + 2x$ and let $\mathcal{C}$ be the curve $c(t) = \langle t, t^2, t^3 \rangle$ for $t = 0$ to 1. Compute

$$\int_{\mathcal{C}} f(x, y, z)\ ds.$$