Math 10B - Calculus of Several Variables II
Quiz 3
May 6, 2011

Name: Key

1	2	Total
/5	/5	/10

Problem 1 (5 points). *Let $f : \mathbb{R}^n \to \mathbb{R}$ be a continuous function and let $\mathbf{c} : [a, b] \to \mathbb{R}^n$ be any C^1 path. Define the* **scalar line integral**

$$\int_{\mathbf{c}} f \, ds.$$

$$\int_{\vec{c}} f \, ds = \int_a^b f(\vec{c}(t)) \, \|\vec{c}\,'(t)\| \, dt$$

Problem 2 (5 points). *Let $\mathbf{F} : \mathbb{R}^n \to \mathbb{R}^m$ be a smooth vector field and let $\mathbf{c} : [a, b] \to \mathbb{R}^n$ be any C^1 path. Define the* **vector line integral**

$$\int_{\mathbf{c}} \mathbf{F} \cdot ds.$$

$$\int_{\vec{c}} \vec{F} \cdot d\vec{s} = \int_a^b \vec{F}(\vec{c}(t)) \cdot \vec{c}\,'(t) \, dt$$