Math 241 C8   **Name:**

Quiz # 4

March 5, 2013

No electronic devices, notes, or interpersonal communication allowed.

Show work to get credit.

(1) [10pts] Use an appropriate path integral to find the flow of $\mathbf{F}(x, y) = (xy, -x)$ along the part of the parabola $y = x^2$ from $(0, 0)$ to $(2, 4)$.

(2) Consider the vector field $\mathbf{F}(x, y) = (y, x + e^y)$.

    (a) [4pts] Find a potential function for $\mathbf{F}$. (Remember, that means an f such that $\nabla f = \mathbf{F}$.)

    (b) [2pts] Find $\int_C \mathbf{F} \cdot d\mathbf{r}$, where C is the unit circle, counterclockwise.

    (c) [4pts] Find $\int_C \mathbf{F} \cdot d\mathbf{r}$, where C is the first-quadrant part of the unit circle going from $(0, 1)$ to $(1, 0)$.