MATH 251, Section _____ Quiz#10 (Sections 14.3, 14.4, 14.5).
Thursday, Nov. 7, 2013 Dr. M. Vorobets
Due Tuesday, Nov. 12, 2013 at the beginning of class.

NAME (print): _____

No credit for unsupported answers will be given. Clearly indicate your final answer. Staple all the sheets.

1. Given the vector field $\vec{F}(x,y) = \langle e^{2y}, 1 + 2xe^{2y} \rangle$.

   (a) *[3 pts.]* Find a function f such that $\vec{F} = \nabla f$.

   (b) *[1 pts.]* Use part (a) to evaluate $\int_C \vec{F} \cdot d\vec{r}$ if the curve C is given by the vector equation $\vec{r}(t) =< te^t, 1 + t >$, $0 \leq t \leq 1$.

2. *[3 pts.]* A particle starts at the point (-2,0), moves along the x-axis to (2,0), and then along the semicircle $y = \sqrt{4 - x^2}$ to the starting point. Use Green's Theorem to find the work done by the force field $\vec{F}(x, y) =< x, x^3 + 3xy^2 >$.

3. *[3 pts.]* Find the curl and the divergence of the vector field

$$\vec{F}(x, y, z) = e^{xyz}\vec{\imath} + \sin(x - y)\vec{\jmath} - \frac{xy}{z}\vec{k}$$