STAPLE YOUR WORK

QUIZ 10 MATH 221

LAST NAME_____ FIRST NAME_____

On my honor, as an Aggie, I certify that the solution submitted by me is my own work. I had neither given nor received unauthorized aid on this work.

Signature: _____

Due Thursday 04/10 at the beginning of class.

- If turned in later than 10 minutes into class, 10 points off. No papers will be accepted after class.
- If you turn it in to my office (Blocker 245E) make sure you do it before 3:00pm, 04/10.
- YOUR WORK MUST BE NEAT, EASY TO FOLLOW.
- You may use notes and textbook, but not the help of anything else.

1. Determine if the vector field $\mathbf{F}(x, y) = \langle 12xy + 28x^3y^7 + 2013, 49x^4y^6 + 6x^2 - 24y^2 \rangle$ is conservative or not. If it is conservative, find its potential.

2. Evaluate $\int_C \nabla f \cdot \mathrm{d}\mathbf{r}$ for $f(x, y, z) = xyz^2$ and C is given by $\mathbf{r}(t) = \langle t, t^2 + 1, t + 2 \rangle$, $1 \leq t \leq 2$.

3. Find the potential function for the vector field

$$\mathbf{F}(x, y, z) = \left\langle 2x \ln(y^2 z), \frac{2x^2}{y} - 27y^2 z^4, \frac{x^2}{z} - 36y^3 z^3 \right\rangle.$$

4. Consider the line integral $\int_C \langle 3 - 8y, 4x + y\rangle \cdot \mathrm{d}\mathbf{r}$, where C is the positively oriented circle of radius 1 centered at the origin. Evaluate the integral

   (a) directly;

   (b) using Green's theorem.