

Math 53 - Multivariable Calculus

Quiz # 10

November 10th, 2011

Exercise 1. Let $\vec{F} = \langle e^x \sin(y), e^x \cos(y) \rangle$. Find a potential function for \vec{F} and then evaluate $\int_C \vec{F} \cdot d\vec{r}$ where C is ANY path from (a, b) to (c, d) .

Exercise 2. Use Green's theorem to find the work done by the force $\vec{F} = \langle x(x+y), xy^2 \rangle$ in moving a particle from the origin along the x -axis to $(1, 0)$, then along the line segment to $(0, 1)$, and then back to the origin along the y -axis.

Exercise 3. Is there a vector field \vec{F} on \mathbb{R}^3 such that $\nabla \times \vec{F} = \langle x \sin(y), \cos(y), z - xy \rangle$? Explain why or why not!