MATH 116-02 QUIZ 12

Surname\ Name:

ID:

Problem 1. Let $\mathbf{F} = (2xy + z^2)\vec{i} + (x^2 + 2yz + e^z)\vec{j} + (y^2 + 2xz + ye^z)\vec{k}$ be a vector field in the xyz-space.

(i) Prove that $\mathbf{F}$ is conservative.

(ii) Find its potential function.

(iii) Evaluate the integral $\int_C \mathbf{F} \cdot d\mathbf{r}$, where C is any smooth path joining $A = (1, 0, 2)$ to $B = (3, 4, 0)$.