

Show all work. 5 points each.

1) Find a potential function f so $\nabla f = F$ and use it to evaluate $\int_C \mathbf{F} \cdot d\mathbf{r}$ where $\mathbf{F}(x, y) = \langle y, x + 2y \rangle$ and $C: \mathbf{r}(t) = t^2\mathbf{i} + 2t\mathbf{j}$ for $0 \leq t \leq 1$

2) Use Green's Theorem to evaluate the integral along the positively oriented curve C , where C is the square with sides $x = 0$, $x = 1$, $y = 0$ and $y = 1$.

$$\int_C e^y dx + 2xe^y dy$$