

Show all work. 5 points each.

1) Determine if $\mathbf{F}(x, y) = \langle e^y, xe^y \rangle$ is a conservative vector field by checking $P_y = Q_x$.

2) Compute $\int_C \mathbf{F}(x, y) \cdot d\mathbf{r}$ where $\mathbf{F}(x, y) = \langle y, x+2y \rangle$ and $C : \mathbf{r}(t) = \sqrt{t}\mathbf{i} + (1+t^3)\mathbf{j}$ and $0 \leq t \leq 1$.