

Show all work clearly and in order, and circle your final answers. Justify your answers.

PROBLEM ONE Compute $\int_C xy^2 dx + y dy$ where C is the curve from $(0,0)$ to $(1,4)$ along the graph of $y = x^3 + 3x$.

PROBLEM TWO Compute $\int_C \vec{F}(x,y) \cdot d\vec{r}$ where $\vec{F}(x,y) = x^2\vec{i} + \sqrt{y}\vec{j}$ and C is given by $\vec{r}(t) = 2t^2\vec{i} + \sin(t)\vec{j}$