Questions

1. Let $\mathbf{F}$ be the vector field $\mathbf{F}(x, y, z) = -2y\hat{\mathbf{i}} - \hat{\mathbf{j}} + (x^2 + 1)\,\hat{\mathbf{k}}$ and C the curve given by $\mathbf{r}(t) = t^2\hat{\mathbf{i}} + \hat{\mathbf{j}} + 4t^3\hat{\mathbf{k}}$ for $-1 \leq t \leq 0$. Calculate $\displaystyle\int_C \mathbf{F} \cdot \mathbf{dr}$.