Questions

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