

Questions

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