

Questions

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