

Questions

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