

Questions

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