

Questions

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