

Questions

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