

Questions

1. Let \mathbf{F} be the vector field $\mathbf{F}(x, y, z) = (x + 5)\hat{\mathbf{i}} + (y^2 - 2z + 1)\hat{\mathbf{j}} + y\hat{\mathbf{k}}$ and C the curve given by $\mathbf{r}(t) = t(t+3)\hat{\mathbf{i}} - 3\hat{\mathbf{j}} + \hat{\mathbf{k}}$ for $-3 \leq t \leq 2$. Calculate $\int_C \mathbf{F} \cdot d\mathbf{r}$.