Questions

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