Questions

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