

## Questions

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