Q1. Find directional derivative of the scalar function $f = x^2 y - xe^z$ at $(2, -1, 0)$ in the direction of $(2, -4, 1)$.

Q2. Find divergence of curl of $F = 2xy\hat{i} + xe^y\hat{j} + 2z\hat{k}$
Q3. Compute line integral $\int_C xdx - yzdy + e^z dz$ along a curve parameterized by $x = t^3$, $y = -t$ and $z = t$.

Q4. Express the vector function $\vec{r}(t) = 2t^2 \hat{i} + 3t^2 \hat{j} + 4t^2 \hat{k}$ with $1 \leq t \leq 3$ in terms of arc length $S$. 