Math 301-152   Quiz 2 (B)

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Q.1: Find curl and divergence of the vector field $\overrightarrow{F}(x, y, z) = 3yz \ln(x)\hat{i} + (4x - 5y)\hat{j} + 2xy^2z^3\hat{k}$.

Q.2: Find work done by the force $\overrightarrow{F}(x, y, z) = yz\hat{i} + xz\hat{j} + xy\hat{k}$ acting along the curve

$\vec{r}(t) = 2t^3\hat{i} + 3t^2\hat{j} - t\hat{k}$ from $t = 1$ to $t = 3$.

Q.3: Determine whether the vector field $\overrightarrow{F}(x,y) = (4x^3y^3+5)\hat{i}+(3x^4y^2-5)\hat{j}$ is a conservative field. If so, find a potential function Φ for $\overrightarrow{F}$ and evaluate $\int_{(0,1)}^{(1,2)} \overrightarrow{F} \cdot d\vec{r}$.