
Show all work. 5 points each.

1. Compute the curl of $\mathbf{F} = \langle y^2z^3, 2xyz^3, 3xy^2z^3 \rangle$. Is the vector field conservative?

2. **Set up the integral** $\iint_S x^2z^2dS$ where S is the part of the cone $z^2 = x^2 + y^2$ that lies between the cones $z = 1$ and $z = 3$.