Assignment 2

The due date for submitting this assignment has passed. As per our records you have not submitted this assignment.

4. Volume integral

Suppose \( V \) is bounded by the surfaces: \( x = 0, y = 0, z = 6, z = -2, z = 4 \). The volume integral \( \int_V \mathbf{F} \cdot d\mathbf{F} \) for \( \mathbf{F} = (x^2 + y^2 + z^2) \) is:

- 125
- 164
- 21
- 124

Yes, the answer is incorrect. Reassessed Answer:

6. Divergence theorem

A field of density \( \rho(x, y, z) \) moves with velocity \( \mathbf{u}(x, y, z) \). The current density \( \mathbf{J} \) is given by \( \mathbf{J} = \rho \mathbf{u} \). If there are no sources or sinks, applying divergence theorem the relation you find between \( \mathbf{J} \) and \( \mathbf{u} \) is:

- \( \nabla \cdot \mathbf{J} = \rho \nabla \cdot \mathbf{u} \)
- \( \nabla \cdot \mathbf{J} = \rho \mathbf{u} \cdot \nabla \mathbf{u} \)
- \( \nabla \cdot \mathbf{J} = \rho \mathbf{u} \cdot \nabla \mathbf{u} \)
- \( \nabla \cdot \mathbf{J} = \rho \mathbf{u} \cdot \nabla \mathbf{u} \)

Yes, the answer is incorrect. Reassessed Answer:

7. Stokes' theorem

Let \( \mathbf{F} = x \mathbf{i} - 3y \mathbf{j} + 4z \mathbf{k} \) be the line integral of the vector field \( \mathbf{F} \). If \( \mathbf{C} \) is the boundary of the region \( R \), then the line integral of \( \mathbf{F} \) along \( \mathbf{C} \) is:

- 2x
- 3x
- 4x
- 2y

Yes, the answer is incorrect. Reassessed Answer: