FINAL Exam 172

MATH 513

Quiz 1:

Is $F = \{(x.y.z) \in R^3 : x - 2y + 3z = 0\} \cup \{(x.y.z) \in R^3 : x = \ln(y + z)\}$ a subspace of R^3? Justify!

Quiz 2:

For what values of a and b is the matrix

$$\begin{pmatrix} 3 & a & 0 \\ -6 & 0 & 6 \\ 0 & b & -3 \end{pmatrix}$$

orthogonally diagonalizable, find the passage matrix and the diagonal matrix.

Quiz 3:

Verify Stoke's theorem for $F = 3x^2yi - 4xzj + yz^2k$

a) S_1 is the upper half sphere with radius $\sqrt{2}$ and center $(0,0,0)$.

b) S_2 is the disc of radius $\sqrt{2}$ and center $(0,0,0)$.

Quiz 4: Let $I := \int_{(0,0,0)}^{(1,1,1)} (2xdx + 3y^2dy + 4z^3dz)$.

Prove that the system is conservative

Find the potential

Use the FTC to evaluate the integral