"QUIZ" for Lecture 22

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E-MAIL SCANNED .pdf OF COMPLETED QUIZ to DrZcalc3@gmail.com (Attachment: q22FirstLast.pdf) ASAP BUT NO LATER THAN Nov. 16, 8:00pm

Evaluate the surface integral $\int\int_S \mathbf{F} \cdot d\mathbf{S}$ for the given vector field $\mathbf{F}$ and oriented surface S.

$$\mathbf{F}(x, y, z) = \langle xy\,,\, yz\,,\, zx \rangle \quad ,$$

and S is the part of the paraboloid $z = 1 - x^2 - y^2$ that lies above the square $0 \le x \le 1\,,\ 0 \le y \le 1$ and has upward orientation.

$z = g = 1 - x^2 - y^2$ $\iint_D \left(-P\frac{dg}{dx} - Q\frac{dg}{dy} + R\right) dA$

$\iint_D \left(-xy \cdot -2x\right) - \left(yz \cdot -2y\right) + zx = 2x^2y + 2y^2z + zx \to \iint_D 2x^2y + (2y^2 + x)z$

$\iint_D 2x^2y + (2y^2 + x)(1 - x^2 - y^2)$ $D\{(x,y) \mid 0 < x < 1, 0 < y < 1\}$

maple = 83/180