

“QUIZ” for Lecture 22

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Section: 24

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 $\iint_S \mathbf{F} \cdot d\mathbf{S}$ for the given vector field \mathbf{F} and oriented surface S .

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

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

$$\iint (2x^2y + 2zy^2 + zx)dA = \int_0^1 \int_0^1 (2x^2y + 2(1 - x^2 - y^2) + x(1 - x^2 - y^2))dx dy = \frac{13}{12}$$