

**“QUIZ” for Lecture 22**

Wenhao Li

NAME: (print!) \_\_\_\_\_ Section:     All    

**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  $0 \leq x \leq 1, 0 \leq y \leq 1$  and has upward orientation.

$$\begin{aligned} P &= xy & Q &= yz & R &= zx \\ \int \int_S (-xy^2 - 2x - yz^2 - 2y + zx) dA \\ &= \int_0^1 \int_0^1 (2x^2y + 2y^2(1 - x^2 - y^2) + x - x^3 - xy^2) dx dy & x=0..1 & y=0..1 \\ &= 83/180 \end{aligned}$$