

"QUIZ" for Lecture 16

NAME: (print!) Orion Kress-Sanfilippo Section: 22

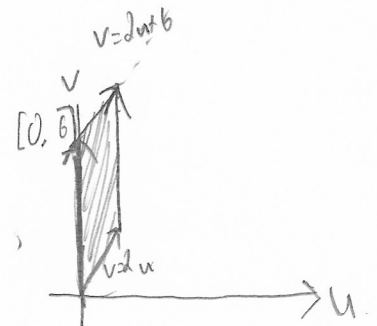
E-MAIL SCANNED .pdf OF COMPLETED QUIZ to DrZcalc3@gmail.com (Attachment: q16FirstLast.pdf) ASAP BUT NO LATER THAN Nov. 2, 8:00pm

1. Compute the Jacobian of the transformation

$$\begin{aligned} \Phi(r, s) &= (rs, r + s) \\ &= \det \begin{vmatrix} \Phi_r(r) & \Phi_r(s) \\ \Phi_s(r) & \Phi_s(s) \end{vmatrix} = \det \begin{vmatrix} r & 1 \\ s & 1 \end{vmatrix} \\ &= (r - s) \end{aligned}$$

2. Let $D = \Phi(R)$ where $\Phi(u, v) = (u + v, v^2)$ and $R = [0, 6] \times [1, 2]$. Calculate

$$\iint_D y \, dA \quad \begin{matrix} X = u + v \\ Y = v^2 \end{matrix}$$



(Note: it is not necessary to compute D).

Jacobian

$$\det \begin{vmatrix} 1 & 0 \\ 1 & 2v \end{vmatrix} = 2v$$

Done in maple

$$\int_0^6 \int_{2u}^{2u+6} v^2 (2v \, dv \, du)$$

$$R = \{(u, v) \mid 2u \leq v \leq 2u + 6; 0 \leq u \leq 1\}$$

$$= \boxed{1248}$$