

Name _____

Mathematics 206a: Multivariable Calculus

Winter Semester 2009

David Haines

Quiz #15

April 2

Let $\mathbf{F}(x, y) = (xy, x + y)$. Let R be the triangular region in the first quadrant bounded by the curves $y = 0$, $x = 1$, and $y = x$. Show that Green's Theorem is true in this setting by calculating these two integrals: [Note that for Part B the boundary of the triangle must be parametrized in three pieces, C_1 , C_2 , and C_3 oriented correctly!]

$$\text{A. } \iint_R \left(\frac{\partial F_2}{\partial x} - \frac{\partial F_1}{\partial y} \right) dA =$$

$$\text{B. } \oint_{\partial R} \mathbf{F} \cdot d\mathbf{x} = \oint_{C_1} \mathbf{F} \cdot d\mathbf{x} + \oint_{C_2} \mathbf{F} \cdot d\mathbf{x} + \oint_{C_3} \mathbf{F} \cdot d\mathbf{x} =$$