# GREEN'S THEOREM PROBLEM

**Theorem 0.1.** *Let $R_1$ be the region in $\mathbb{R}^2$ bounded by the curves $x = d, y = c, y = f(x)$ where $f(x) = y$ is the same curve as $x = g(y)$ (i.e. $f$ is invertible on the interval of interest) and $f(x) > c$ on the region of interest. Prove*

$$-\int\int_{R_1} \frac{\partial P}{\partial y} dx dy = \int_{\partial R_1} P dx.$$

18.024 Multivariable Calculus with Theory
Spring 2011