

MATH 275

November 12, 2007

Names _____

1. Sketch the region D in the first quadrant enclosed by $y = x$, $y = 1/x$, and $y = x/9$. Label the points of intersection of the curves along the boundary of D .

2. Let C be the counter-clockwise path along the boundary of D . Parametrize C . *Hint: You will need to parametrize C separately along each of $y = x$, $y = 1/x$, and $y = x/9$:*

3. The area of the region D is $\int \int_D dA$. We will apply Green's theorem and change this double integral over a region into a line integral, but first find P and Q such that

$$\int \int_D dA = \int \int_D \left(\frac{\partial Q}{\partial x} - \frac{\partial P}{\partial y} \right) dA.$$

Hint: There are many choices for P and Q – make it simple.

4. Use one of your choices for P and Q in 3. and your parametrization of C in 2. to find the area of D using a line integral.