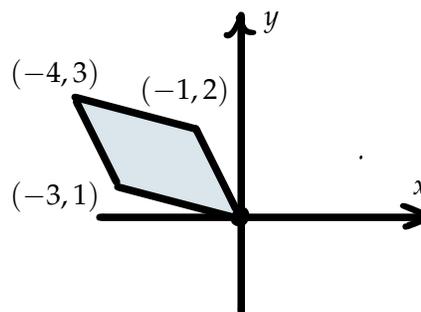## Math 241 - Quiz 5- Thursday, November 10

Your name here:

1. Let P be the parallelogram in the plane in the figure to the right. Write C for the boundary curve of P.

   (a) Let $F(x,y) = (-y^2 + y, x^2 + y)$. Use Green's theorem to rewrite $\int_C F \cdot d\mathbf{r}$ as a double integral. (2 points)

$$\int_C F \cdot d\mathbf{r} =$$

   (b) Use a change of coordinates to rewrite your answer from part (a) as a double integral over the unit square $[0,1] \times [0,1]$. (3 points)

   (c) Evaluate the integral you found in part (c). (2 points)

2. Let S be the surface parametrized by $\mathbf{r}(u, v) = (u^2 + 1, v^3 + 1, u + v)$. Find an equation for the tangent plane to S at the point $\mathbf{r}(1, 1)$.   (3 points)