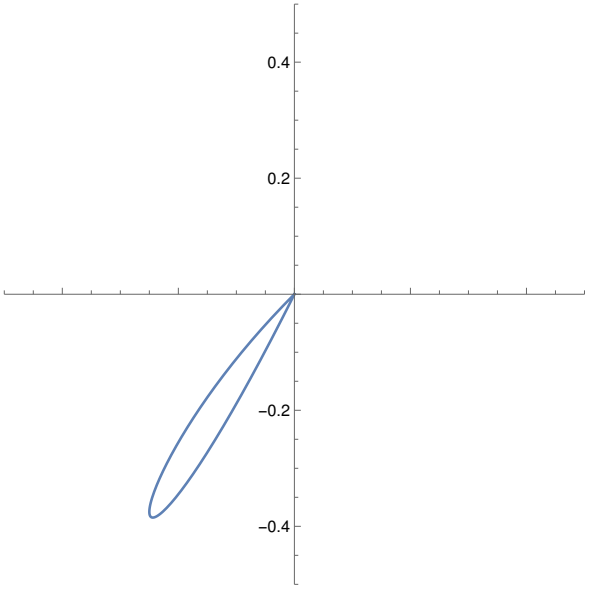
Math 241 Quiz 5

Names: _____

1. Use Green's theorem to find the area enclosed by the vector valued function $\mathbf{r}(t) = \langle t^2 - t, t^3 - t^2 \rangle$.



2. Let a, b, c be positive numbers. Use a surface integral to find the surface area of part of the plane $ax + by + cz = 1$ that lies in the first octant of $\mathbb{R}^3$.

3. Recall that the curl of a vector field F is $\nabla \times F$. What is the curl of a conservative vector field? Why?

4. Let $f(x, y, z)$ be a function from $\mathbb{R}^3$ to $\mathbb{R}$. Show that the vector field $f\nabla f$ is conservative.