Math 223, Fall 2010
Extra Credit Problem(s) for HW #8
Due date: Friday 10/29/10

(#1) How do you parametrize a spiral? That is, find a parametric curve $\mathbf{x} : \mathbb{R}^2 \to \mathbb{R}$ such that as $t \to \infty$, the values of $\mathbf{x}(t)$ move toward the origin, but wrap around it infinitely often. (Hint: It may help to first work out $\mathbf{x}(t)$ in polar coordinates, then to convert it to rectangular coordinates.)

Next, figure out a vector field $\mathbf{F}$ that has $\mathbf{x}$ as a flow line.

What's the domain of $\mathbf{F}$ in the function that you found? Is it possible to define $\mathbf{F}$ continuously at the origin?