

Review for Math 252 Test 2

1. Show that $c(t) = (\sin t, \cos t, e^t)$ is a flow line for $f(x, y, z) = (y, -x, z)$.
2. Find and classify the relative extrema of $f(x, y) = e^{x^2 - y^2}$.
3. Find the divergence and curl of $F(x, y, z) = (x, 3xy, z)$ at the point $(1, 1, 1)$.
4. Find the second order Taylor expansion of $f(x, y) = e^y \cos x$ about $(0, 0)$.
5. Find the arclength of $c(t) = (4, t^2, t^3)$ for $0 \leq t \leq 1$.
6. Find the extrema of $f(x, y) = x^2 - y$ if $x^2 + y^2 \leq 25$.