Math 496-004 **Assignment # 7** **8 Oct 08**

Due: Oct 13th

1. Let $f(x, y) = (y - x^2)(y - 2x^2)$.
   (a) Show that the origin is a critical point of f and the two-variable second derivative test fails at the origin.
   (b) Show that, if $g : \mathbb{R} \to \mathbb{R}$ is the restriction of f to any line through the origin, then g has a local minimum at the origin.
   (c) Show that f does not have a local minimum at the origin.
2. Do problem II.4.15 in Edwards (page 99). That is, find and classify the critical points of the function $f(x, y) = (x^2 + y^2)e^{x^2-y^2}$.