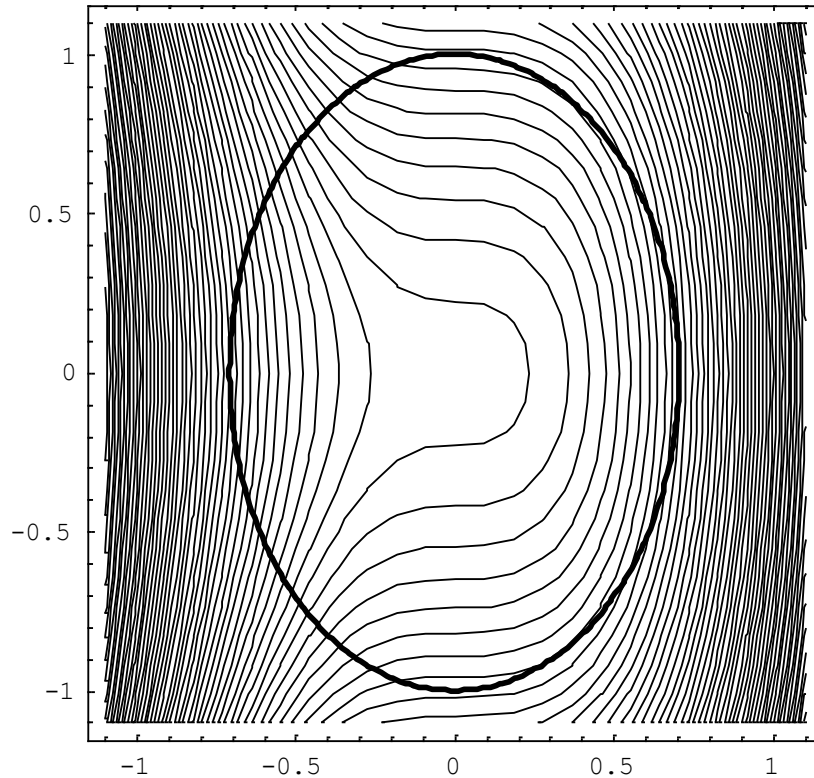


King Fahd University of Petroleum & Minerals
Department of Mathematics and Statistics
(Semester 182) Math 201 Quiz # 5

Name: _____ I.D. # _____ Sr. # _____

2. A contour plot of $f(x, y) = 4x^3 + y^2$ along with the constraint (dark curve) is shown in the accompanying figure. Indicate on the figure all points at which the condition stated by the method of Lagrange multipliers (i.e. $\nabla f(x_o, y_o) = \lambda \nabla g(x_o, y_o)$, where $g(x, y) = 0$ is the constraint curve) is satisfied. Also, mark clearly the constrained relative maxima and minima of the function. *[Please note that you are not supposed to solve any equations]*



3. Given the function $f(x, y) = 2x^2 + y^2 - y$, find all relative maxima, relative minima, and saddle points if any exist.