Quiz 3 for Calculus ++, Math 2605A1-2, February 19, 2004

Name:

This quiz is to be taken without calculators and notes of any sorts. The allowed time is 25 minutes. Provide exact answers; not decimal approximations! For example, if you mean $\sqrt{2}$ do not write $1.414\ldots$.

I: (5 points) Maximize the function $f(x,y) = x^2 + 4xy + y^2$ subject to the constraint $x^2 + y^2 = 1$.

II: (5 points) Using the point $\begin{bmatrix} 1 \\ 0 \end{bmatrix}$ as an initial value, apply one step of Newtons method to calculate an approximate value for the solution of the system

$$ xy - 1 = 0 \ , x^2 - y^2 - 2 = 0 \ . $$

III: (Additional 3 points credit) Calculate the Givens rotation in the first step of the Jacobi algorithm for the matrix

$$ \begin{bmatrix} 4 & 1 & 4 \\ 1 & 3 & 2 \\ 4 & 2 & -2 \end{bmatrix} . $$

You only have to calculate the Givens rotation.