(1) Roots are 8.6132

1.4296

-0.81556

(2)

$$\underline{D} = \begin{pmatrix} \partial F/\partial x & \partial G/\partial x \\ \partial F/\partial y & \partial G/\partial y \end{pmatrix}$$

$$= \begin{pmatrix} -2e^{-x^2}(x^3 - x) & \dfrac{2x^3(x^2y^2+2)}{(1+x^2y^2)^2} \\ 2y & -\dfrac{2x^4 y}{(1+x^2y^2)^2} \end{pmatrix}$$

The roots, after using

$\vec{x}_{n+1} = \vec{x}_n - \underline{D}^{-1} f(\vec{x})$, are

(3) init points chosen were

(a) $[A, \tau] = (1, 1), (1, .1), (1, 10)$

(b) $[A, B, \tau_1, \tau_2] = (1111), (111\ .1),$

$(111\ 10)$

(c)

Using this, we sometimes find that the biexp. is the same as single exp. (that is, $\tau_1 \approx \tau_2$). Other times, the data are better fit using Biexp. (all 3 datasets), if we compare the M.S. errors of the two methods. For the third set, there is negligible improvement, which could be due to overfitting.