GEORGIA TECH   SCHOOL OF MATHEMATICS
                                                                                    MATH 1502

CALCULUS II, SECTION D
Quiz # 7
October 15th 2008

First Name : _____

Last Name : _____

1. Give a one-to-one parametrization of the line passing through the points $\mathbf{p}_0 = \begin{bmatrix} 2 \\ 0 \\ 1 \end{bmatrix}$ and $\mathbf{p}_1 = \begin{bmatrix} -1 \\ 1 \\ -1 \end{bmatrix}$ *(Give results here and use the back pages for your calculations)*

2. Find an equation for the plane passing though the points $\mathbf{p}_0 = \begin{bmatrix} 2 \\ 0 \\ 1 \end{bmatrix}$, $\mathbf{p}_1 = \begin{bmatrix} -1 \\ 1 \\ -1 \end{bmatrix}$ and $\mathbf{p}_2 = \begin{bmatrix} 2 \\ 1 \\ 0 \end{bmatrix}$ *(Give results here and use the back pages for your calculations)*

3. In this question the image S of the unit circle by the matrix $A = \begin{bmatrix} 2 & 1 \\ 1 & 2 \end{bmatrix}$ will be studied.

   (a) Give the equation of S

   (Give results here and use the back pages for your calculations)

   (b) Compute the maximum distance of a point of S to the origin.

   (Hint : write $x_1 = \cos t, x_2 = \sin t$ for the components of a vector $\mathbf{x}$, compute the vector $A\mathbf{x}$

   and compute the square of its length, then maximize over t.)

   (Give results here and use the back pages for your calculations)

   Maximal length $=$

4. Give the augmented matrix of the following system of linear equations :

$$
\begin{aligned}
x_1 + x_2 - x_3 + 2x_4 &= 1 \\
-x_1 - x_2 - 2x_3 + 3x_4 &= -1 \\
x_1 + x_2 - 4x_3 + 7x_4 &= 1 \\
x_1 + x_2 + 2x_3 + x_4 &= 0
\end{aligned}
$$

$$[A|b] =$$

Use the bottom of this page and the back page for your calculations

Use this page for your calculations