GEORGIA TECH   SCHOOL OF MATHEMATICS
                                                  MATH 1502

CALCULUS II, SECTION D
Quiz # 7
October 14, 2009

First Name : _____

Last Name : _____

1. Let $A = \begin{bmatrix} 0 & 0 & 0 & 0 \\ 1 & -2 & 1 & 0 \\ 1 & 3 & 0 & 1 \\ 0 & 0 & 0 & 0 \end{bmatrix}$. Let B be another 4×4 matrix. Which columns of B can be changed without changing the product BA.

Columns =

2. Let $\mathbf{u} = \begin{bmatrix} -4/5 \\ 3/5 \end{bmatrix}$ and let $\mathbf{x} = \begin{bmatrix} 2 \\ 1 \end{bmatrix}$. Compute the vectors $\mathbf{x}_{\parallel}$ and $\mathbf{x}_{\perp}$

$\mathbf{x}_{\parallel} =$

$\mathbf{x}_{\perp} =$

3. Let $\mathbf{v}$ be the vector in $\mathbb{R}^n$ with components $(1, a, a^2, \cdots, a^{n-1})$. Compute its length as a function of a

(Hint : compute the square of the length first! Then use the geometric sum)

$|\mathbf{v}| =$

4. Let A be a $p \times m$ matrix and let B be a $m \times n$ matrix. Is it true that, if the columns of B are all the same, then the columns of AB are all the same? Explain your reply.

$$TRUE\ \square \qquad\qquad\qquad FALSE\ \square$$

5. Let $A = \begin{bmatrix} 0 & \sqrt{3}/3 & \sqrt{6}/3 \\ \sqrt{2}/2 & \sqrt{3}/3 & -\sqrt{6}/6 \\ -\sqrt{2}/2 & \sqrt{3}/3 & -\sqrt{6}/6 \end{bmatrix}$. Is it an isometry? Why?

$$YES\ \quad \square \qquad\qquad\qquad NO\ \quad \square$$