CALCULUS II, SECTION D
Quiz # 6
October 8th 2008

First Name : _____

Last Name : _____

1. Let $A = \begin{bmatrix} 2 & 0 \\ 0 & 3 \end{bmatrix}$. What is the condition on $B = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$ so that $AB \neq BA$?

2. Compute the angle between $\mathbf{x} = \begin{bmatrix} 1 \\ \sqrt{3} \end{bmatrix}$ and $\mathbf{y} = \begin{bmatrix} -1 \\ \sqrt{3} \end{bmatrix}$.

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

(Hint : write A in terms of its columns, then BA, then write its in terms of the columns of B)

4. Let P be the parallelogram with sides $\mathbf{e}_1$ and $\mathbf{e}_1 + 2\mathbf{e}_2$. What is the image of P by $C = \begin{bmatrix} 1 & 0 \\ -1 & 1 \end{bmatrix}$? Please draw P and $C(P)$ on the same graph.

5. Write the equation of the image of the unit circle by $D = \begin{bmatrix} 2 & -1 \\ 1 & 0 \end{bmatrix}$