CALCULUS II
Quiz # 9
October 31st 2007

First Name : _____

Last Name : _____

Section & TA's name : _____

1. Show that $U = \begin{bmatrix} \frac{1}{\sqrt{3}} & \frac{2}{\sqrt{6}} & 0 \\ \frac{1}{\sqrt{3}} & \frac{-1}{\sqrt{6}} & \frac{1}{\sqrt{2}} \\ \frac{1}{\sqrt{3}} & \frac{-1}{\sqrt{6}} & \frac{-1}{\sqrt{2}} \end{bmatrix}$ is orthogonal.

2. Let $B = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 2 & 3 \end{bmatrix}$

   (a) Give an LU factorization of B

(b) Compute the reduced row echelon form rref(B) of B

3. Let $A = \begin{bmatrix} 1 & 1 \\ 1 & 2 \end{bmatrix}$

   (a) Show that A is positive definite

   (b) Find a lower triangular matrix L such that $A = LL^t$

   (Hint : through row reduction find L lower triangular such that $L^{-1}A = L^t$)