Georgia Tech   School of Mathematics

Calculus II, Section D
Quiz # 11
November 22 2010

First Name : _____

Last Name : _____

All along this quiz A will denote the 3×4 matrix $A = \begin{bmatrix} 1 & 1 & 1 & 1 \\ 1 & 3 & 4 & 4 \\ 1 & -1 & -2 & -2 \end{bmatrix}$.

1. *(3 pts)* By using the Gram-Schmidt procedure on the columns of A, give an orthonormal basis of $\mathrm{Im}(A)$. *(Hint : compute the rank of A first and check that it coincides with the number of elements of this basis)*

(Use this page for your calculations)

2. *(3 pts)* Give the QR factorization $A = Q_cR$. *(Hint : compute the size and the rank of each matrix and check that Q_c is an isometry)*

$$Q_c \; =$$

$$R \; =$$

3. *(4 pts)* Give the QR factorization of R^t in the form $R^t = Q_r T^t$. Compute T. *(Hint : compute the size and the rank of each matrix and check that Q_r is an isometry)*

$$Q_r \ =$$

$$T \ =$$

(Use this page for your calculations)