Problem Sheet 8 for 6401

Due Thursday 8 November 2011, at the Problem Class. You should hand in solutions to all problems, but only some of them will be marked. The deadline for handing in your work is 11.55 am.

1. Use the elementary row operations to reduce given matrices to row echelon form and reduced row echelon form:

(a) $\begin{pmatrix} 1 & 1 \\ 2 & 3 \end{pmatrix}$;

(b) $\begin{pmatrix} 1 & -1 & 1 \\ 2 & 4 & 3 \\ 5 & 6 & 2 \end{pmatrix}$;

(c) $\begin{pmatrix} 3 & 2 & 3 & -2 & 5 & 7 \\ 1 & 0 & 3 & 0 & 1 & -2 \\ 5 & 2 & 9 & -2 & 7 & 3 \\ 0 & 0 & 1 & 1 & 4 & -7 \\ 2 & 2 & 1 & -1 & 8 & 2 \end{pmatrix}$.

2. Determine whether the given matrix is invertible. If so, calculate the inverse.

(a) $\begin{pmatrix} 2 & 1 \\ 3 & 2 \end{pmatrix}$;

(b) $\begin{pmatrix} 3 & 2 & 1 \\ 0 & 2 & 2 \\ 0 & 0 & -1 \end{pmatrix}$;

(c) $\begin{pmatrix} 1 & 1 & 1 & 1 \\ 1 & 2 & -1 & 2 \\ 1 & -1 & 2 & 1 \\ 1 & 3 & 3 & 2 \end{pmatrix}$;

(d) $\begin{pmatrix} 1 & 6 & 2 \\ -2 & 3 & 5 \\ 7 & 12 & -4 \end{pmatrix}$.