MATH 280-01 (122)
HW # 5

Q1. Let $S = \{1, 2, 3, 4, 5\}$ and consider the permutation $\sigma = 35142$.
List all inversions of σ and then determine if it is even or odd permutation.

Q2. Let

$$A = \begin{bmatrix} 2 & 3 & -4 \\ 0 & -4 & 2 \\ 1 & -1 & 5 \end{bmatrix}$$

(a) Find the cofactors of all the elements of A and then find the adjoint of A.
(b) Find A^{-1} by using the Therom.

Q3. Find the detrminant of

$$C = \begin{bmatrix} 6 & 2 & 1 & 0 & 5 \\ 2 & 1 & 1 & -2 & 1 \\ 1 & 1 & 2 & -2 & 3 \\ 3 & 0 & 2 & 3 & -1 \\ -1 & -1 & -3 & 4 & 2 \end{bmatrix}$$

Show all of the steps.

Q4. Without expanding the detrminant, show that

$$det \begin{bmatrix} 1 & a & b+c \\ 1 & b & c+a \\ 1 & c & a+b \end{bmatrix} = 0$$

Q5. Determine the general 2×2 matrix A for which $A = AdjA$.