MATH 1210 Tutorial # 8

Nov. 3 – 9, 2011

1. Evaluate $\det(A)$ where

$$A = \begin{pmatrix} 0 & 1 & 1 & 1 \\ 1 & 0 & 1 & 1 \\ 1 & 1 & 0 & 1 \\ 1 & 1 & 1 & 0 \end{pmatrix}.$$

2. Given that $\det \begin{pmatrix} a_1 & b_1 & c_1 & d_1 \\ a_2 & b_2 & c_2 & d_2 \\ a_3 & b_3 & c_3 & d_3 \\ a_4 & b_4 & c_4 & d_4 \end{pmatrix} = 1$, find the value of $\det \begin{pmatrix} a_1+b_1 & a_1-b_1 & c_1 & d_1 \\ a_2+b_2 & a_2-b_2 & c_2 & d_2 \\ a_3+b_3 & a_3-b_3 & c_3 & d_3 \\ a_4+b_4 & a_4-b_4 & c_4 & d_4 \end{pmatrix}$.

3. Find all solutions of the equation

$$\det \begin{pmatrix} x+2 & -2 & -3 \\ 2 & x-3 & -2 \\ 4 & -2 & x-5 \end{pmatrix} = 0.$$

4. Evaluate

$$\det \begin{pmatrix} 1+i & 2 & 3 \\ 4 & i & 5 \\ 6 & 0 & i-1 \end{pmatrix} - \det \begin{pmatrix} 1 & 2 & 3 \\ 4 & i & 5 \\ 6 & 0 & i-1 \end{pmatrix}.$$

Can you do this without finding the explicit values of both determinants?

5. Evaluate

$$\det \begin{pmatrix} 4 & 0 & 0 & 1 & 0 \\ 3 & 3 & 3 & -1 & 0 \\ 1 & 2 & 4 & 2 & 3 \\ 9 & 4 & 6 & 2 & 3 \\ 2 & 2 & 4 & 2 & 3 \end{pmatrix}.$$