Mathematics 2360 Name (please print) Key

Quiz 5-B

Feb 18, 2010

I. (3) Use the elimination method to evaluate det(A) for $A = \begin{pmatrix} 0 & 1 & 2 & 3 \\ 1 & 1 & 1 & 1 \\ -2 & -2 & 3 & 3 \\ 1 & 2 & -2 & -3 \end{pmatrix}$

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

$$= -\begin{vmatrix} 1 & 1 & 1 & 1 \\ 0 & 1 & 2 & 3 \\ 0 & 0 & 5 & 5 \\ 0 & 0 & -5 & -7 \end{vmatrix} = -\begin{vmatrix} 1 & 1 & 1 & 1 \\ 0 & 1 & 2 & 3 \\ 0 & 0 & 5 & 5 \\ 0 & 0 & 0 & -2 \end{vmatrix} = -(-10) = 10$$

II. (2) Use the value of det(A) to evaluate $\begin{vmatrix} 0 & 1 & 2 & 3 \\ 1 & 1 & 1 & 1 \\ -6 & -6 & 9 & 9 \\ 1 & 2 & -2 & -3 \end{vmatrix} + \begin{vmatrix} -2 & -2 & 3 & 3 \\ 1 & 2 & -2 & -3 \\ 0 & 1 & 2 & 3 \\ 1 & 1 & 1 & 1 \end{vmatrix}$ -1 -1

$$= 3\det(A) + (-1)(-1)\det(A)$$

$$= 4\det(A)$$

$$= 40$$