Ec138 Practice Questions.

Ch15.

Note: Numbers of the question correspond to the question number on the book. Refer to the answers to these questions ~~that~~ listed back of the book. Enjoy!

15.2.2 Evaluate $A+B$ and $3A$ when $A=\begin{pmatrix}0 & 1\\ 2 & 3\end{pmatrix}$ $B=\begin{pmatrix}1 & -1\\ 5 & 2\end{pmatrix}$.

15.2.4 Evaluate $A+B$, $A-B$ & $5A-3B$ when $A=\begin{pmatrix}0 & 1 & -1\\ 2 & 3 & 7\end{pmatrix}$ & $B=\begin{pmatrix}1 & -1 & 5\\ 0 & 1 & 9\end{pmatrix}$

15.3.1. Compute the products AB & BA, if possible

(a) $A=\begin{pmatrix}0 & -2\\ 3 & 1\end{pmatrix}$ $B=\begin{pmatrix}-1 & 4\\ 1 & 5\end{pmatrix}$ (b) $A=\begin{pmatrix}8 & 3 & -2\\ 1 & 0 & 4\end{pmatrix}$ $B=\begin{pmatrix}2 & -2\\ 4 & 3\\ 1 & -5\end{pmatrix}$

15.3.3. Let $A=\begin{pmatrix}1 & 2 & -3\\ 5 & 0 & 2\\ 1 & -1 & 1\end{pmatrix}$ $B=\begin{pmatrix}3 & -1 & 2\\ 4 & 2 & 5\\ 2 & 0 & 3\end{pmatrix}$ $C=\begin{pmatrix}4 & 1 & 2\\ 0 & 3 & 2\\ 1 & -2 & 3\end{pmatrix}$

Find the matrix AB, BA, $(AB)C$.

15.4.1. Verify the distributive law $A(B+C) = AB + AC$ when

$A=\begin{pmatrix}1 & 2\\ 3 & 4\end{pmatrix}$ $B=\begin{pmatrix}2 & -1 & 1 & 0\\ 3 & -1 & 2 & 1\end{pmatrix}$ $C=\begin{pmatrix}-1 & 1 & 1 & 2\\ -2 & 2 & 0 & -1\end{pmatrix}$

15.5.1. Find the transpose of $A=\begin{pmatrix}3 & 5 & 8 & 3\\ -1 & 2 & 6 & 2\end{pmatrix}$ $B=\begin{pmatrix}0\\ -1\\ 2\end{pmatrix}$ $C=(1, 5, 0, -1)$

15.5.2. Let $A=\begin{pmatrix}3 & 2\\ -1 & 5\end{pmatrix}$ $B=\begin{pmatrix}0 & 2\\ 2 & 2\end{pmatrix}$, $\alpha=-2$. Compute A', B', $(AB)'$, $B'A'$.

ch16

16.1.1. Calculate the following determinants

(a) $\begin{vmatrix}3 & 0\\ 2 & 6\end{vmatrix}$ (b) $\begin{vmatrix}a & a\\ b & b\end{vmatrix}$ (c) $\begin{vmatrix}a+b & a-b\\ a-b & a+b\end{vmatrix}$ (d) $\begin{vmatrix}3^t & 2^t\\ 3^{t-1} & 2^{t-1}\end{vmatrix}$

16.1.4. Let $A=\begin{pmatrix}a_{11} & a_{12}\\ a_{21} & a_{22}\end{pmatrix}$ and $B=\begin{pmatrix}b_{11} & b_{12}\\ b_{21} & b_{22}\end{pmatrix}$. Show that $|AB|=|A|\cdot|B|$

16.2.1. Use "Expansion by cofactors" to calculate the determinants.

$$\left[\,|A| = a_{11}\begin{vmatrix}a_{22} & a_{23}\\ a_{32} & a_{33}\end{vmatrix} - a_{12}\begin{vmatrix}a_{21} & a_{23}\\ a_{31} & a_{33}\end{vmatrix} + a_{13}\begin{vmatrix}a_{21} & a_{22}\\ a_{31} & a_{32}\end{vmatrix}\,\right]$$

(a) $\begin{vmatrix}1 & -1 & 0\\ 1 & 3 & 2\\ 1 & 0 & 0\end{vmatrix}$ (b) $\begin{vmatrix}1 & -1 & 0\\ 1 & 3 & 2\\ 1 & 2 & 1\end{vmatrix}$

16.2.2 Let $A=\begin{pmatrix}1 & -1 & 0\\ 1 & 3 & 2\\ 1 & 2 & 1\end{pmatrix}$ $B=\begin{pmatrix}1 & 2 & 3\\ 2 & 3 & 4\\ 0 & 1 & -1\end{pmatrix}$

Calculate AB, $|A|$, $|B|$, $|A|\cdot|B|$ & $|AB|$

← Could you find $|AB| = |A|\cdot|B|$?