Dawson College: Linear Algebra: 201-105-DW Section 05

February 9, 2009

Name: SOLUTIONS

Student ID: _____

Quiz 3

Question 1. *(4 marks)* Determine which of the following expressions are defined for the matrices

$A_{4\times5}$ $B_{4\times5}$ $C_{5\times2}$ $D_{4\times2}$ $E_{5\times4}$.

For those that are defined give the size (dimensions) of the resulting matrix.

a) $AC+D$ 4 X 2

b) $E(AC)$ 5 X 2

c) E^TA UNDEFINED

d) $E(A+B)$ 5X5

Question 2. *(6 marks)*

Given: $A=\begin{bmatrix} 3 & 0 \\ -1 & 2 \\ 1 & 1 \end{bmatrix}$ $B=\begin{bmatrix} 1 & 5 \\ -1 & 0 \end{bmatrix}$ $C=\begin{bmatrix} 6 & 1 \\ -1 & 1 \end{bmatrix}$

Find:

a) $C-B = \begin{bmatrix} 6 & 1 \\ -1 & 1 \end{bmatrix} - \begin{bmatrix} 1 & 5 \\ -1 & 0 \end{bmatrix} = \begin{bmatrix} 5 & -4 \\ 0 & 1 \end{bmatrix}$

b) $2A^T = 2\begin{bmatrix} 3 & 0 \\ -1 & 2 \\ 1 & 1 \end{bmatrix}^T = 2\begin{bmatrix} 3 & -1 & 1 \\ 0 & 2 & 1 \end{bmatrix} = \begin{bmatrix} 6 & -2 & 2 \\ 0 & 4 & 2 \end{bmatrix}$

c) $\frac{1}{2}(AB) = \frac{1}{2}\left(\begin{bmatrix} 3 & 0 \\ -1 & 2 \\ 1 & 1 \end{bmatrix}\begin{bmatrix} 1 & 5 \\ -1 & 0 \end{bmatrix}\right) = \frac{1}{2}\begin{bmatrix} 3 & 15 \\ -3 & -5 \\ 0 & 5 \end{bmatrix} = \begin{bmatrix} \frac{3}{2} & \frac{15}{2} \\ -\frac{3}{2} & -\frac{5}{2} \\ 0 & \frac{5}{2} \end{bmatrix}$