Dawson College: Chem Tech / Lab Tech: 201-921-DW 01

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Name: Solutions

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Quiz 4

Question 1. *(5 marks)* Given

$$A=\begin{bmatrix} -1 & 4 & -7 \\ 2 & -6 & 11 \end{bmatrix} \quad B=\begin{bmatrix} 7 & 9 & -6 \\ 4 & -1 & -8 \end{bmatrix} \quad C=\begin{bmatrix} 3 & 19 \\ 7 & -5 \end{bmatrix}$$

find:

(a) $3A-B$

(b) $-C-A$

(c) $-\frac{1}{2}A+B$

a) $3A-B = 3\begin{bmatrix} -1 & 4 & -7 \\ 2 & -6 & 11 \end{bmatrix} - \begin{bmatrix} 7 & 9 & -6 \\ 4 & -1 & -8 \end{bmatrix} =$

$= \begin{bmatrix} -3 & 12 & -21 \\ 6 & -18 & 33 \end{bmatrix} - \begin{bmatrix} 7 & 9 & -6 \\ 4 & -1 & -8 \end{bmatrix} = \begin{bmatrix} -10 & 3 & -15 \\ 2 & -17 & 41 \end{bmatrix}$

b) NOT POSSIBLE ✓

c) $-\frac{1}{2}\begin{bmatrix} -1 & 4 & -7 \\ 2 & -6 & 11 \end{bmatrix} + \begin{bmatrix} 7 & 9 & -6 \\ 4 & -1 & -8 \end{bmatrix} = \begin{bmatrix} 1/2 & -2 & 7/2 \\ -1 & 3 & -11/2 \end{bmatrix} + \begin{bmatrix} 7 & 9 & -6 \\ 4 & -1 & -8 \end{bmatrix}$

$= \begin{bmatrix} \frac{15}{2} & 7 & -\frac{5}{2} \\ 3 & 2 & -\frac{27}{2} \end{bmatrix}$

Question 2. *(5 marks)* Find AB and BA if possible.

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

$AB = \begin{bmatrix} -3 & 2 & 0 \\ 1 & -4 & 5 \end{bmatrix}\begin{bmatrix} -2 & 0 \\ 4 & -6 \\ 5 & 1 \end{bmatrix} = \begin{bmatrix} (-3)(-2)+(2)(4)+(0)(5) & (-3)(0)+(2)(-6)+(0)(1) \\ (1)(-2)+(-4)(4)+(5)(5) & (1)(0)+(-4)(-6)+(5)(1) \end{bmatrix}$

$= \begin{bmatrix} 14 & -12 \\ 7 & 29 \end{bmatrix}$

$BA = \begin{bmatrix} -2 & 0 \\ 4 & -6 \\ 5 & 1 \end{bmatrix}\begin{bmatrix} -3 & 2 & 0 \\ 1 & -4 & 5 \end{bmatrix} = \begin{bmatrix} (-2)(-3)+(0)(1) & (-2)(2)+(0)(-4) & (-2)(0)+(0)(5) \\ (4)(-3)+(-6)(1) & (4)(2)+(-6)(-4) & (4)(0)+(-6)(5) \\ (5)(-3)+(1)(1) & (5)(2)+(1)(-4) & (5)(0)+(1)(5) \end{bmatrix}$

$= \begin{bmatrix} 6 & -4 & 0 \\ -18 & 32 & -30 \\ -14 & 6 & 5 \end{bmatrix}$