Matrix Operations and Their Applications

1. a) Give the order of each matrix
b) If $A = [a_{ij}]$, identify a_{32} and a_{23} or explain why identification is not possible
(similar to p.588 #4)

$$\begin{bmatrix} -2 & 1 & 3 & 5 \\ 7 & -1 & 2 & -3 \\ 4 & -5 & 11 & -8 \end{bmatrix}$$

2. Find the following matrices:
a) A + B, b) A - B, c) -4A, d) 3A + 2B
(similar to p.589 #12)

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

4. Solve each matrix equation for X:
X - B = A
(similar to p.589 #18)

$$A = \begin{bmatrix} 4 & -1 \\ 5 & 2 \\ 1 & -2 \end{bmatrix} \quad B = \begin{bmatrix} 3 & -4 \\ 7 & 1 \\ -5 & 1 \end{bmatrix}$$

5. Solve each matrix equation for X:
2X + 5A = B
(similar to p.589 #22)

$$A = \begin{bmatrix} 4 & -1 \\ 5 & 2 \\ 1 & -2 \end{bmatrix} \quad B = \begin{bmatrix} 3 & -4 \\ 7 & 1 \\ -5 & 1 \end{bmatrix}$$

7. Find (if possible) the following matrices:
a) AB b) BA
(similar to p.589 #28)

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

8. Find (if possible) the following matrices:
a) AB b) BA
(similar to p.589 #30)

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

9. Find (if possible) the following matrices:
a) AB b) BA
(similar to p.589 #34)

$$A=\begin{bmatrix}1 & -2\\-3 & 4\\5 & -1\end{bmatrix} \quad B=\begin{bmatrix}7 & 1 & 2\\3 & -5 & -4\end{bmatrix}$$

10. Perform the indicated matrix operations given that A, B, and C are defined as follows. If an operation is not defined, state the reason:
A(B + C)
(similar to p.589 #40)

$$A=\begin{bmatrix}2 & 0\\-1 & 3\\-5 & 2\end{bmatrix} \quad B=\begin{bmatrix}-1 & -4\\2 & -7\end{bmatrix} \quad C=\begin{bmatrix}5 & 1\\3 & -2\end{bmatrix}$$