SHOW ALL WORK AND JUSTIFY ALL ANSWERS.

1. Given the matrices with the indicated dimensions:

$$A_{3x3} \quad B_{4x3} \quad C_{3x3} \quad D_{3x4}$$

Which of the following are valid matrix operations? There may be more than one.

(a) $AB + C$

(b) $AD + B$

(c) $CD + B^T$

(d) $DB + C$

(e) None of the above

2. Let $A = \begin{bmatrix} -2 & 6 & -4 & 2 \\ 5 & 2 & 7 & -3 \\ n & -1 & 0 & 7 \\ 8 & g & 4 & 6 \\ 7 & 11 & 1 & 1 \\ 8 & 3 & h & 10 \end{bmatrix}$ and $B = \begin{bmatrix} 8 & 1 & 3x \\ 6 & 2y & 10 \\ 3z & 6 & 9 \\ 2 & 5m & 7 \end{bmatrix}$

If $AB = C$, find c_{31} and c_{42}. Show your work.