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NAME: OLUNADARA, Kolade Oluwagbemileke

DEPARTMENT: Electrical Electronics Engineering

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QUESTION

If $A = 3i + 4j - 6k$, $B = 5i - 11j + 2k$ (and $C = 7i - 7j + k$), FIND

1) $A \cdot C + B \cdot C$

$$(A \cdot C) = (3i + 4j - 6k) \cdot (7i - 7j + k)$$

$$= (21) + (-28) + (-6)$$

$$= -13$$

$$(B \cdot C) = (5i - 11j + 2k) \cdot (7i - 7j + k)$$

$$= (35) + (77) + (2)$$

$$= 114$$

$$\therefore A \cdot C + B \cdot C = -13 + 114$$

$$= \underline{\underline{101}}$$

(2) $(A - B) \cdot C$

$$(A - B) = (3i + 4j - 6k) - (5i - 11j + 2k)$$

$$= (3-5)i + (4+11)j + (-6-2)k$$

$$= -2i + 15j - 8k$$

$$(A - B) \cdot C = (-2i + 15j - 8k) \cdot (7i - 7j + k)$$

$$= (-14) + (-105) + (-8)$$

$$= -127$$

$$(3). A \cdot (B \times C)$$

$$= \begin{array}{|c|c|c|} \hline 3 & 4 & -6 \\ \hline \end{array}$$

$$\begin{array}{|c|c|c|} \hline 5 & -11 & 2 \\ \hline \end{array}$$

$$\begin{array}{|c|c|c|} \hline 7 & -7 & 1 \\ \hline \end{array}$$

$$= 3 \begin{array}{|c|c|c|} \hline -11 & 2 & -4 \\ \hline \end{array} \begin{array}{|c|c|} \hline 5 & 2 \\ \hline \end{array} \begin{array}{|c|c|} \hline -6 & 5 \\ \hline \end{array} \begin{array}{|c|c|} \hline -11 & -7 \\ \hline \end{array}$$

$$\begin{array}{|c|c|} \hline -7 & 1 \\ \hline \end{array} \begin{array}{|c|c|} \hline 7 & 1 \\ \hline \end{array} \begin{array}{|c|c|} \hline 7 & -7 \\ \hline \end{array}$$

$$= 3(-11+14) - 4(5-14) - 6(-35+77)$$

$$= 3(3) - 4(-9) - 6(42)$$

$$= 9 + 36 - 252$$

$$= \underline{\underline{-207}}$$