Name: Ige Ayodeji Oluwasegun S/N: 33
Dept: Civil Engineering
Matric No: 19/ENG03/014

MAT102 Assignment

$A = 3i + 4j - 6k$

$B = 5i - 11j + 2k$

$C = 7i - 7j + k$

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

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

$= 21i - 28j - 6k$

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

$= 35i + 77j + 2k$

$\therefore A \cdot C + B \cdot C = 21i - 28j - 6k + 35i + 77j + 2k$

$= 56i + 49j - 4k$

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

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

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

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

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

$= -14i - 105j - 8k$

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

$$(B \times C) = \begin{vmatrix} i & j & k \\ 5 & -11 & 2 \\ 7 & -7 & 1 \end{vmatrix}$$

$$i\begin{vmatrix} -11 & 2 \\ -7 & 1 \end{vmatrix} - j\begin{vmatrix} 5 & 2 \\ 7 & 1 \end{vmatrix} + k\begin{vmatrix} 5 & -11 \\ 7 & -7 \end{vmatrix}$$

$\Rightarrow i[-11 + 14] - j[5 - 14] + k[-77 + 35]$

$= 3i + 9j - 42k$

$\therefore A \cdot (B \times C) = (3i + 4j - 6k) - (3i + 9j - 42k)$

$= 9i + 36j + 252k$