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Course: MAT 102

Department: Computer Engineering

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

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

$$C = 7i - 7j + k$$

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

$$A \cdot C = (3i + 4j - 6k) \cdot (7i - 7j + k)$$
$$= 21i - 28j - 6k$$

$$B \cdot C = (5i + 11j + 2k) \cdot (7i - 7j + k)$$
$$= 35i + 77j + 2k$$

$$A \cdot C + B \cdot C$$

$$21i - 28j - 6k + 35i + 77j + 2k$$
$$56i + 49j - 4k$$

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

$$(A - B) = (3i + 4j - 6k) - (5i + 11j + 2k)$$
$$= 3i + 4j - 6k - 5i + 11j - 2k$$
$$= -2i + 15j - 8k$$

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

$$= (-2i + 15j - 8k) \cdot (7i - 7j + k)$$
$$= 14i - 105j - 8k$$

$$3) \quad A \cdot [B \times C]$$

$$(B \times C)$$

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

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

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

$$3i + 9j - 42k$$

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

$$(3i + 4j - 6k) - (3i + 9j - 42k)$$

$$9i + 36j + 252k$$