SERIAL Nº : 130

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COMPUTER ENGINEERING (19/ENG02/054)
MAT 102 (ASSIGNMENT)
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$A = 3i + 4j - 6k$, $B = 5i - 11j + 2k$, $C = 7i - 7j + k$

find (1) $A \cdot C + B \cdot C$
(2) $(A - B) \cdot C$
(3) $A \cdot (B \times C)$

Solution

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

$A \cdot C = 21 - 28 - 6$

$A \cdot C = -13$

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

$B \cdot C = 35 + 77 + 2$

$B \cdot C = 114$

$A \cdot C + B \cdot C = -13 + (114)$

$A \cdot C + B \cdot C = 101$

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

$A - B = (-2i + 15j - 8k)$

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

$(A - B) \cdot C = -14 - 105 - 8$

$(A - B) \cdot C = -127$

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

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

$(-11 + 14)i \quad -(5 - 14)j \quad (-35 + 77)k$

$B \times C = 3i + 9j + 42k$

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

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

$$A \cdot (B \times C) = 9 + 36 - 252$$

$$A \cdot (B \times C = -207$$