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M/ENG04/004

Elect/Elect Engineering

MAT102 Assignment

$$A = 3i + 4j - 6k; B = 5i - 11j + 2k; C = 7i - 7j + k$$

Find:

① $A \cdot C + B \cdot C$

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

$$= (21i - 28j - 6k) = 21 - 28 - 6 = -13$$

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

$$= (35i + 77j + 2k) = 35 + 77 + 2 = 114$$

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

$$= -13 + 114 = 101$$

② $(A - B) \cdot C$

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

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

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

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

$$= (-14i - 115j - 8k)$$

$$= -14 - 115 - 8 = -137$$

③ $A \cdot (B \times C)$

$$\begin{array}{ccc} i+ & j- & k+ \\ \left| \begin{array}{ccc} 3 & 4 & -6 \\ 5 & -11 & 2 \\ 7 & -7 & 1 \end{array} \right| \end{array}$$

$$+3 \left| \begin{array}{cc} -11 & 2 \\ -7 & 1 \end{array} \right| - 4 \left| \begin{array}{cc} 5 & 2 \\ 7 & 1 \end{array} \right| - 6 \left| \begin{array}{cc} 5 & -11 \\ 7 & -7 \end{array} \right|$$

$$+3(-11+14) - 4(5-14) - 6(-35+77) \\ = 9 + 36 - 252 = -207$$