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COURSE: MAT 102

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ASSIGNMENT

If  $A = 3i + 4j - 6k$ ,  $B = 5i - 11j + 2k$ ,  $C = 3i + 7j - 7k + k$ . Find

1)  $A.C + B.C$

$$[(3i+4j-6k) \cdot (3i+4j-6k)] + [(5i-11j+2k) \cdot (7i-7j+k)]$$

$$A.C + B.C = [21i - 28j - 6k] + [35i + 77j + 2k]$$

$$A.C + B.C = 56i + 49j - 4k \quad 56 + 49 = 101$$

and the

2)  $A \cdot B \cdot C$

$$(A \cdot B) \cdot C = [(3i+4j-6k) \cdot (5i-11j+2k)] [7i-7j+k]$$

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

$$(A \cdot B) \cdot C = -14i + -14j - 105k - 8$$

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

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

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

$$i(-11-2) - j(5-2) + k(5-11)$$

$$= -13i - 3j - 6k$$

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

$$A.(B \times C) = (3i + 4j - 6k) \cdot (3i + 9j - 12k)$$

$$A. \quad \neq$$

$$3) A.(B \times C) = \begin{vmatrix} 3 & 4 & 6 \\ 5 & -11 & 2 \\ 7 & -7 & 1 \end{vmatrix}$$

$$3 \begin{vmatrix} -11 & 2 \\ -7 & 1 \end{vmatrix} - 4 \begin{vmatrix} 5 & 2 \\ 7 & 1 \end{vmatrix} + 6 \begin{vmatrix} 5 & -11 \\ 7 & -7 \end{vmatrix}$$

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

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

$$A.(B \times C) = 225$$