

MAI 102

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

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

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

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

$$\begin{aligned} A \cdot C &= (3 \times 7) + (4 \times -7) + (-6 \times 1) \\ &= 21 - 28 + 6 \\ &= -1 \end{aligned}$$

$$\begin{aligned} B \cdot C &= (5 \times 7) + (-11 \times -7) + (2 \times 1) \\ &= 35 + 77 + 2 \\ &= 114 \end{aligned}$$

$$\begin{aligned} A \cdot C + B \cdot C &= 114 - 1 \\ &= 113 \end{aligned}$$

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

$$\begin{aligned} A - B &= (3i + 4j - 6k) - (5i - 11j + 2k) \\ &= (3i + 4j - 6k) - 5i + 11j - 2k \\ &= -2i + 15j - 8k \end{aligned}$$

$$\begin{aligned} (A - B) \cdot C &= (-2i + 15j - 8k) \cdot (7i - 7j + k) \\ &= (-2 \times 7) + (15 \times -7) + (-8 \times 1) \\ &= -14 - 105 - 8 \\ &= -127 \end{aligned}$$

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

$$\begin{array}{c|ccc} B \times C & i & j & k \\ \hline & 5 & -11 & 2 \\ & 7 & -7 & 1 \end{array}$$

$$\begin{array}{c|cc|c|cc|cc} i & -11 & 2 & j & 5 & 2 & k & 5 & -11 \\ & -7 & 1 & & 7 & 1 & & 7 & -7 \end{array}$$

$$\begin{aligned} &= i(-11 + 14) - j(5 - 14) + k(-35 + 77) \\ &= 3i + 9j + 38k \end{aligned}$$