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

$$\begin{aligned} \textcircled{1} A \cdot C &= (3i + 4j - 6k) \cdot (7i - 7j + k) \\ &= 21 - 28 - 6 \\ &= -13 \end{aligned}$$

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

$$\therefore A \cdot C + B \cdot C = -13 + 114 = \underline{\underline{101}}$$

$$\textcircled{2} (A - B) = (-2i + 15j - 8k)$$

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

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

$$i[(C-11 \times D) - (2 \times -7)] - j[(5 \times D) - (2 \times 7)] + k[(5 \times -7) - (-11 \times 7)]$$

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

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

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

$$= 9 + 36 - 252$$

$$= -207 //$$