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

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

$$A \cdot C = (3i + 4j - 6k) \cdot (7i - 7j + k)$$
$$= 21 - 28 - 6$$
$$= -13$$

$$B \cdot C = (5i - 11j + 2k) \cdot (7i - 7j + k)$$
$$= 35 + 77 + 2$$
$$= 114$$
$$-13 + 114$$
$$= 101$$

2)

$$2) (A-D) - C$$

$$A-D = 3i + 4j - 6k - 5i - 11j + 2k$$
$$= -2i + 15j - 8k$$

$$-2i + 15j - 8k - 7i - 7j + k$$

$$= -14 - 105 - 8$$

$$= -127$$

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

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

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

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

$$i[3] - j[-9] + k[42]$$

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

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

$$3i + 4j - 6k \cdot 3i + 9j + 42k$$

$$= 9 + 36 - 252$$

$$= -207$$