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Mechanical Engineering

19/ENG 06 1005

$$A = 3i + 4j - 6k, \quad B = 5i - 11j + 2k, \quad C = 7i - 7j + k \quad \text{Ans 1}$$

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

$$A = 3i + 4j - 6k = \underline{3i + 4j - 6k}$$

$$C = 7i - 7j + k = \underline{7i - 7j + k}$$

$$21 + (-28) + (-6) = -13$$

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

$$= 35 + 77 + 2$$

$$= 114$$

$$A \cdot C + B \cdot C = -13 + 114 = 101$$

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

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

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

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

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

$$= (-14 + (-165) + (-8))$$

$$= -127$$

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

$(B \times C)$

+ - +

i	j	k
5	-11	2
7	-7	1

5	-11	2
7	-7	1

5	2	+k
7	1	

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

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

$$(-11 + 14)k - j (-9) + (-35 + 77)k$$

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

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

$$= 9 + 36 - 252 = -207$$