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(i) $-3(2i-j)+7(3i+j-11k)-8(4i+4j-5k)$

$-6i+3j+21i+7j-77k-32i-32j+40k$

$-17i-22j-37k$

$\therefore -3A+7B-8C=-17i-22j-37k$

(ii) $K=2(2i-j)+4(3i+j-11k)-C(4i+4j-5k)$

$K=4i-2j+12i+4j-44k-4i+4j-5k=12i+6j-49k$

$K=12i+6j-49k$

$|K|=\sqrt{(12)^2+(6)^2+(-49)^2}=50.80$

$\alpha=\cos\alpha=\frac{12}{50.80}$

$\beta=\cos b=\frac{6}{50.80}$

$\gamma=\cos C=\frac{-49}{50.80}$

(iii) $A \times (B \times C)$

$$B \times C \quad \begin{vmatrix} i & -j & k \\ 3 & 1 & -11 \\ 4 & 4 & -5 \end{vmatrix}$$

$i(-5+44) - j(-15+44) + k(12-4)$

$39i + \underline{\underline{29}}j + 8k$

$$A \times (B \times C) \quad \begin{vmatrix} i & -j & k \\ 2 & -1 & 0 \\ 39 & 29 & 8 \end{vmatrix}$$

$i(-8) - j(16-0) + k(58+39)$

$-8i - 16j + 97k$

$\therefore A \times (B \times C) = -8i - 16j + 97k$

(iv) $(3A \times B) \cdot (A \times 2B)$

$3A = 6i - 3j$

$3A \times B$ $\begin{vmatrix} i & -j & k \\ 6 & -3 & 0 \\ 3 & 1 & -11 \end{vmatrix}$

$i(33) - j(-66) + k(6+9)$

$33i + 66j + 15k$

$2B = 6i + 2j - 22k$

$A \times 2B$ $\begin{vmatrix} i & -j & k \\ 2 & -1 & 0 \\ 6 & 2 & -22 \end{vmatrix}$

$i(22) - j(-44) + k(4+6)$

$22i + 44j + 10k$

$\therefore (3A \times B) \cdot (A \times 2B)$

$(6 \times 22) + (2 \times 4) + (-22 \times 10) = 0.$

(v) $A - 2B - C$

$2i - j - (6i + 2j - 22k) - (4i + 4j - 5k)$

$2i - j - 6i - 2j + 22k - 4i - 4j + 5k$

$-8i - 7j + 27k$

$\therefore A - 2B - C = -8i - 7j + 27k$

(2.) Two vectors $\bar{A}$ and $\bar{B}$ are perpendicular if and only if their scalar product is equal to zero.

Two vectors $\bar{A}$ and $\bar{B}$ are said to be coplanar if their scalar triple product is zero.