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COMPUTER ENGINEERING. 19/ENG02/050.

ASSignment

1. $A = 4i + j - 2k$, $B = 3i - 2j + k$, $C = i - 2k$.

a. $(A - 2B) \times C$.

$(A - 2B) = (4i + j - 2k) + [-2(3i - 2j + k)]$.

$= 4i + j - 2k - 6i + 4j - 2k$.

$= -2i + 5j - 4k$.

$\therefore (A - 2B) \times C = \begin{vmatrix} i & j & k \\ -2 & 5 & -4 \\ 1 & 0 & -2 \end{vmatrix}$

$i \begin{vmatrix} 5 & -4 \\ 0 & -2 \end{vmatrix} - j \begin{vmatrix} -2 & -4 \\ 1 & -2 \end{vmatrix} + k \begin{vmatrix} -2 & 5 \\ 1 & 0 \end{vmatrix}$

$i(-10 + 4) - j(4 + 4) + k(0 - 5)$

$= -6i - 8j - 5k$.

b. $A \times (2C \times 3B)$

$(2C \times 3B) = \begin{vmatrix} i & j & k \\ 2 & 0 & -4 \\ 9 & -6 & 3 \end{vmatrix}$

$i \begin{vmatrix} 0 & -4 \\ -6 & 3 \end{vmatrix} - j \begin{vmatrix} 2 & -4 \\ 9 & 3 \end{vmatrix} + k \begin{vmatrix} 2 & 0 \\ 9 & -6 \end{vmatrix}$

$i(0 - 24) - j(6 + 36) + k(-12 - 0)$

$-24i - 42j - 12k$.

2. $A = pi - 6j - 3k$, $B = 4i + 3j - k$, $C = i - 3j + 2k$.

$A \cdot (B \times C) = \begin{vmatrix} p & -6 & -3 \\ 4 & 3 & -1 \\ 1 & -3 & 2 \end{vmatrix} = 0$

$p \begin{vmatrix} 3 & -1 \\ -3 & 2 \end{vmatrix} + 6 \begin{vmatrix} 4 & -1 \\ 1 & 2 \end{vmatrix} - 3 \begin{vmatrix} 4 & 3 \\ 1 & -3 \end{vmatrix} = 0$

$p(6 - 3) + 6(8 + 1) - 3(-12 - 3) = 0$

$3p + 54 + 45 = 0$

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$3P + 99 = 0$

$\frac{3P}{3} = \frac{-99}{3}$

$P = -33$.

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