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ATNO: 183 MATNO: 19/ENG03/012.

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

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

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

$(A - 2B) = (4i + j - 2k) - (6i - 4j + 2k)$

$= (-2i + 5j - 4k)$

$(A - 2B) \times C =$

i	j	k
-2	$+5$	-4
1	0	-2

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

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

$(A - 2B) \times C = -10i - 8j - 5k$

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

$2C = 2i - 4k$

$3B = 9i - 6j + 3k$

$(2C \times 3B) =$

i	j	k
2	0	4
9	-6	3

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

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

$(2C \times B) = 24i + 30j - 12k$

$$A \times (2C \times 3B) = \begin{vmatrix} i & j & k \\ 1 & 4 & -2 \\ 24 & 30 & -12 \end{vmatrix}$$

$$i\begin{vmatrix} 1 & -2 \\ 30 & -12 \end{vmatrix} - j\begin{vmatrix} 4 & -2 \\ 24 & -12 \end{vmatrix} + k\begin{vmatrix} 4 & 1 \\ 24 & 30 \end{vmatrix}$$

$$A \times (2C \times 3B) = 42i + 96k$$

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

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

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

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

$$3P + 54 + 45 = 0$$

$$3P = -99$$

$$P = -33$$