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

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

$$(-60 - 12)i - (-48 - 48)j + (24 + 120)k$$

$$72i + 96j + 144k$$

2 $A + B + C = 0$

$$(Pi - 6j - 3k) + (4i + 3j - k) + (i - 3j + 2k) = 0$$

$$Pi - 6j - 3k = -(4i - 3j - k) - (i - 3j + 2k)$$

$$= 4i + 3j + k - i + 3j - 2k$$

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

$$P = -3$$

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$A = 4i + j - 2k$

$B = 3i - 2j + k$

$C = i - 2k$

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

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

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

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

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

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

$-10i + 5k$

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

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

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

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

$24i + 30j - 12k$