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$A = 4i + j - 2k \quad B = 3i - 2j + k \quad C = i - 2k$

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

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

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

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

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

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

$\therefore (A-2B) \times C = i((-10) - (0)) - j(4+4) + k(0-5)$

$= -10i - 8j - 5k$

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

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

$2C = 2i - 4k$

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

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

$2C \times 3B = i(0 - 24) - j(6 + 36) + k(-18 - 0)$

$= -24i - 42j - 18k$

$A \times (2C \times 3B)$ $\begin{vmatrix} i & -j & k \\ 4 & 1 & -2 \\ -24 & -42 & -18 \end{vmatrix}$

$A \times (2C \times 2B) = i(-18-84) - j(-72-48) + k(-168+24)$

$= -102i + 120j - 144k$

$\therefore A \times (2C \times 3B) = -102i + 120j - 144k$

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

Vectors A, B and C are Coplanar if $a \cdot (b \times c) = 0$

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

$A \cdot (B \times C) = P(6+3) - 6(8+1) - 3(-12-3) = 0$

$= 9P - 54 + 45 = 0$

$9P - 9 = 0$

$\frac{9P}{9} = \frac{9}{9}$

$\therefore P = 1$

The value of 'P' for which A, B and C are Coplanar is 1.