

$$1 \begin{bmatrix} 2 & -4 \\ -6 & 3 \end{bmatrix} + j \begin{bmatrix} 2 & -4 \\ 9 & 3 \end{bmatrix} + k \begin{bmatrix} 2 & 2 \\ 9 & -6 \end{bmatrix}$$

$$1[(6+24)] + j[6+(-36)] + k[-12+18]$$

$$30i - 30j + 6k$$

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

⇓

$A \times (2C \times 3B)$	$+$	$-j$	$+k$
	4	-1	-2
	30	-30	6

$$1 \begin{bmatrix} 1 & -2 \\ -30 & 6 \end{bmatrix} + j \begin{bmatrix} 4 & -2 \\ 30 & 6 \end{bmatrix} + k \begin{bmatrix} 4 & 1 \\ 30 & -30 \end{bmatrix}$$

$$1[(6+66)] + j[24+(-80)] + k[-120+30]$$

$$66i - 36j - 90k$$

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

$A \cdot (B \times C)$	$+$	$-j$	$+k$
$p$	-6	-3	
	4	3	-1
	1	-3	2

$$p \begin{bmatrix} 3 & -1 \\ -3 & 2 \end{bmatrix} - 6 \begin{bmatrix} 4 & -1 \\ 1 & 2 \end{bmatrix} - 3 \begin{bmatrix} 4 & 3 \\ 1 & -3 \end{bmatrix}$$

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

$$3p - 54 + 27 = 0$$

$$3p - 27 = 0$$

$$3p = 27$$

$$p = 27/3 = 9$$

∴ The value of  $p = 9$

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

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

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

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

$\Rightarrow -2i - 3j - 4k$

∴

$(A - 2B) \times C$	$i$	$j$	$k$
	$-2$	$-3$	$-4$
	$1$	$1$	$-2$

$i \begin{bmatrix} -3 & -4 \\ 1 & -2 \end{bmatrix} \quad j \begin{bmatrix} -2 & -4 \\ 1 & -2 \end{bmatrix} \quad k \begin{bmatrix} -2 & -3 \\ 1 & 1 \end{bmatrix}$

~~etc~~

$i [(6 + (-4))] \quad j [4 + (-4)] \quad k [-2 + (-3)]$   
 $2i - 5k$

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

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

$3B = 3(3i - 2j + k) = 9i - 6j + 3k$

$(2C \times 3B)$	$i$	$j$	$k$
	$2$	$2$	$-4$
	$9$	$-6$	$3$