

① $A = 4\hat{i} + \hat{j} - 2\hat{k}$ $B = 3\hat{i} - 2\hat{j} + \hat{k}$ $C = \hat{i} - 2\hat{k}$

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

$2B = 2(3\hat{i} - 2\hat{j} + \hat{k})$
 $= 6\hat{i} - 4\hat{j} + 2\hat{k}$

$\therefore (A - 2B) \times C = [4\hat{i} - 6\hat{i} + \hat{j} + 4\hat{j} - 2\hat{k} - 2\hat{k}] \times (\hat{i} - 2\hat{k})$
 $= (-2\hat{i} + 5\hat{j} - 4\hat{k}) \times (\hat{i} - 2\hat{k})$

$= \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ -2 & 5 & -4 \\ 1 & 0 & -2 \end{vmatrix} = \hat{i} \begin{vmatrix} 5 & -4 \\ 0 & -2 \end{vmatrix} - \hat{j} \begin{vmatrix} -2 & -4 \\ 1 & -2 \end{vmatrix} + \hat{k} \begin{vmatrix} -2 & 5 \\ 1 & 0 \end{vmatrix}$
 $= \hat{i}(-10 - 0) - \hat{j}(-4 + 4) + \hat{k}(0 - 5)$
 $= -10\hat{i} - 8\hat{j} - 5\hat{k}$

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

$2C = 2(\hat{i} - 2\hat{k}) = 2\hat{i} - 4\hat{k}$

$3B = 3(3\hat{i} - 2\hat{j} + \hat{k}) = 9\hat{i} - 6\hat{j} + 3\hat{k}$

$A \times (2C \times 3B) = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ 4 & 1 & -2 \\ 2 & 0 & -4 \\ 9 & -6 & 3 \end{vmatrix} = 4 \begin{vmatrix} 0 & -4 \\ -6 & 3 \end{vmatrix} - 1 \begin{vmatrix} 2 & -4 \\ -2 & 2 \end{vmatrix} - 2 \begin{vmatrix} 2 & 0 \\ 9 & -6 \end{vmatrix}$
 $= 4(0 - 24) - 1(6 + 36) - 2(-12 - 0)$
 $= 4(-24) - 1(42) - 2(-12)$
 $= -48 - 42 + 24$
 $= -66$

② $A = p\hat{i} - 6\hat{j} - 3\hat{k}$ $B = 4\hat{i} + 3\hat{j} - \hat{k}$ $C = \hat{i} - 3\hat{j} + 2\hat{k}$

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

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

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

\int^2

\neq^2

$$9P + 54 + 45 = 0$$

$$9P = 99$$

$$P = 11$$

$$(10-5) \times [40 \pm 10 \pm 10 \pm 10 \pm 10] = \dots$$

$$\begin{matrix} 10 & 5 & 10 & 5 & 10 & 5 & 10 & 5 \\ | & | & | & | & | & | & | & | \\ 10 & 5 & 10 & 5 & 10 & 5 & 10 & 5 \end{matrix}$$

$$(10-5) \times (10-5) = (10-5) \times (10-5)$$

$$5 \times 5 = (10-5) \times 5$$

$$25 = (10-5) \times 5$$

$$\begin{matrix} 10 & 5 & 10 & 5 & 10 & 5 & 10 & 5 \\ | & | & | & | & | & | & | & | \\ 10 & 5 & 10 & 5 & 10 & 5 & 10 & 5 \end{matrix} = (10-5)$$

$$(10-5) \times (10-5) = (10-5) \times 5$$

$$(10-5) \times (10-5) = (10-5) \times 5$$

$$5 \times 5 = (10-5) \times 5$$

$$25 = (10-5) \times 5$$