

$$p(6-3) - (-6)(8-(-1)) + 3(-12-3)$$

$$3p + 6(9) + 3(-15) = 0$$

$$3p + 6(9) - 3(-15) = 0$$

$$3p + 54 + 45 = 0$$

$$3p + 99 = 0$$

$$\frac{3p}{3} = \frac{-99}{3}$$

$$p = -33$$

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

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

$$(A - 2B) \times C = \begin{array}{ccc|c} -2 & 5 & -4 & \\ \hline -2 & 5 & -4 & \\ 1 & 0 & -2 & \end{array}$$

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

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

$$= -10i - j(8) + k(-5)$$

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

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

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

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

$$\begin{array}{ccc|c} & i & j & k \\ \hline & 2 & 0 & -4 \\ & 9 & -6 & 3 \end{array}$$

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

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

$$= -24i - 42j - 12k$$

$$A \times (2C \times 3B) = \begin{array}{ccc|c} 4 & 1 & -2 & \\ \hline -24 & -42 & -12 & \end{array}$$

$$i \begin{vmatrix} 1 & -2 \\ -42 & -12 \end{vmatrix} - j \begin{vmatrix} 4 & -2 \\ -24 & -12 \end{vmatrix} + k \begin{vmatrix} 4 & 1 \\ -24 & -42 \end{vmatrix}$$

$$= (-12 - 84)i - (-48 - 48)j + (-168 + 24)k$$

$$= -96i + 96j - 144k$$