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Matric No: 191 ENG 04/003

Department: Elect - Elect Engineering

Course Code: MAT 102

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

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

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

$$A - 2B = 4i + j - 2k - (6i - 4j + 2k)$$
$$= \cancel{-2i} + \cancel{5j} - \cancel{4k} = -2i + 5j - 4k$$

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

$$(A - 2B) \times C = i(C - 10) - j(-4 + 8) + k(0 - 5)$$
$$= -10i - 8j - 5k$$

$$A - 2B \times C = \cancel{-10i - 8j - 5k} \parallel$$
$$-10i - 8j - 5k \parallel$$

$$r = 3x^2$$

$$b) A \times (2C \times 3B) = 2(C_i - 2K) \times 5(3i - 2j + K) \\ = (2P - 4K) \times (9i - 6j + 3K)$$

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

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

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

$$\therefore A \times (2C \times 3B) = (4i + j - 2K) \times (-24i - 42j - 12K)$$

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

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

$$2) A = p_i - 6j - 3k \quad B = 4i + 3j - k \quad C = i - 3j + 2k$$

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

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

$$p [3] \quad 6 [7] \quad -3 [-18] = 0$$

$$3p = -54 - 45$$

$$3p = -99$$

$$p = -33$$