



NAME: KEMDIRIM HIECHUKWU LEMUEL

COURSE: MAT 102

MAT NO: 19/ENGD2/030

DEPT: COMPUTER ENGINEERING

1) $A = 4i + j - 2k$

$B = 3i - 2j + k$

$C = i - 2k$

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

$$\begin{aligned} A - 2B &= (4i + j - 2k) - 2(3i - 2j + k) \\ &= 4i + j - 2k - 6i + 4j - 2k \\ &= -2i + 5j - 4k \end{aligned}$$

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

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

$$\begin{aligned} i &= [0 - 8] \quad -j = [0 + 4] \quad +k = [4 - 5] \\ &= -8i - 4j - k \end{aligned}$$

$$\begin{array}{r} 96 \\ -24 \\ \hline 72 \end{array}$$

$$\begin{array}{r} 36 \\ -12 \\ \hline 24 \end{array}$$

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

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

$$= 2i - 4k$$

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

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

	i	j	k
	2	-4	0
	9	-6	3

$$i = \begin{array}{l} -4 \quad 0 \\ -6 \quad 3 \end{array} \quad -j = \begin{array}{l} 2 \quad 0 \\ 9 \quad 3 \end{array} \quad +k = \begin{array}{l} 2 \\ 9 \end{array}$$

$$i = [-12 \quad -0] \quad -j = [6 \quad -0] \quad +k = [-12 \quad +$$

$$-12i - 6j + 24k$$

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

	i	j	k
	4	1	-2
	-12	-6	24

$$\begin{array}{r} 24 \\ -12 \\ \hline 12 \end{array}$$

$$i = \begin{array}{l} 1 \quad -2 \\ -6 \quad 24 \end{array} \quad -j = \begin{array}{l} 4 \quad -2 \\ -12 \quad 24 \end{array} \quad k = \begin{array}{l} 4 \\ -12 \end{array}$$

$$i = [24 \quad -12] \quad -j = [96 \quad -24] \quad +k = [-12 \quad -12]$$

$$= 12i - 72j$$

$$(2) A = \cancel{p_i + j + 2k} \quad p_i - 6j - 3k$$

$$B = \cancel{3i - 2j + k} \quad 4i + 3j - 1k$$

$$C = \cancel{i - 2k} \quad i - 3j + 2k$$

$$\begin{array}{ccc|cc} & i & j & k & & \\ \hline & p & -6 & -3 & -p & -6 \\ & 4 & 3 & -1 & 4 & -3 \\ & 1 & -3 & 2 & 1 & -3 \end{array}$$

$$\downarrow \downarrow \downarrow \quad - \quad \uparrow \uparrow \uparrow$$

$$(\cancel{6p + 6 + 36}) - (\cancel{-9})$$

$$6p + 6$$

$$(6p + 6 + 36) - (-9 + 3p - 48)$$

$$6p + 42 + 57 - 3p$$

$$3p + 99 = 0$$

$$3p = -99$$

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

$$p = \underline{\underline{-33}}$$