

Image

$$3A \times B = \begin{vmatrix} + & - & + \\ i & j & k \\ 6 & -3 & 0 \\ 3 & 1 & -11 \end{vmatrix}$$
$$= i[33-0] - j[66-0] + k[-6-(-9)]$$
$$= 33i - 66j + 15k$$

$$[3A \times B] = 33i - 66j + 15k$$

$$[A \times 2B] = ?$$

$$2B = 2[3i + 4j - 11k]$$

$$= 6i + 2j - 22k$$

$$[A \times 2B] = \begin{vmatrix} + & - & + \\ i & j & k \\ 2 & -1 & 0 \\ 6 & 2 & -22 \end{vmatrix}$$

$$= i[22-0] - j[44-0] + k[4-(-6)]$$

$$= 22i - 44j + 10k$$

$$[3A \times B] \cdot [A \times 2B] = [33i - 66j + 15k] \cdot [22i - 44j + 10k]$$

$$= 726 + 2904 + 150$$

$$= 3780$$

$$v) A - 2B - C = 2i - j - 6i - 2j + 22k - 4i - 4j + 5k$$

$$= -8i - 7j + 27k$$

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MATH 102 assignment
 Lawal Oba lawal
 1911EN603/027
 Civil Engineering

Answers

$$A = 2i - j, \quad B = 3i + j - 11k, \quad C = 4i + 4j - 5k$$

$$\begin{aligned} \text{ii) } & -3A + 7B - 8C \\ & = -3[2i - j] + 7[3i + j - 11k] - 8[4i + 4j - 5k] \\ & = 6i + 3j + 21i + 7j - 77k - 32i - 32j + 40k \\ & = -17i - 22j - 37k \\ & \therefore -3A + 7B - 8C = -17i - 22j - 37k \end{aligned}$$

$$\begin{aligned} \text{ii) } [A \times B \times C] & + \quad + \quad + \\ [A \times B] & = \begin{bmatrix} i & j & k \\ 2 & -1 & 0 \\ 3 & 1 & -11 \end{bmatrix} \\ & = i[11 - 0] - j[22 - 0] + k[2 - (-3)] \\ [A \times B] & = 11i - 22j + 5k \end{aligned}$$

$$[A \times B \times C] \begin{bmatrix} i & j & k \\ 11 & -22 & 5 \\ 4 & 4 & -5 \end{bmatrix}$$

$$\begin{aligned} & = i[110 - 20] - j[55 - (-20)] + k[44 - (-88)] \\ & = i[90] - j[55 + 20] + k[44 + 88] \\ & = 90i - 75j + 132k \end{aligned}$$

$$[A \times B \times C] = 90i - 75j + 132k$$

$$\text{iv) } [3A \times B] \cdot [A \times 2B]$$

$$3A = 3[2i - j]$$

$$= 6i - 3j$$