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P.S.N = 24

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

$$i - -3A + 7B - 8C$$

$$= -3(2i - j) + 7(3i + j - 11k) - 8(4i + 4j - 5k)$$

$$= -6i + 3j + 21i + 7j - 77k - 32i - 32j + 40k$$

$$= -17i - 22j - 37k$$

$$ii - 2A + 4B - C$$

$$= 2(2i - j) + 4(3i + j - 11k) - (4i + 4j - 5k)$$

$$= 4i - 2j + 12i + 4j - 44k - 4i + 4j - 5k$$

$$= 12i + 6j - 49k$$

Direction cosine

$$|r| = \sqrt{(12)^2 + (6)^2 + (-49)^2}$$

$$= \sqrt{144 + 36 + 2401}$$

$$|r| = \sqrt{2581}$$

$$\cos \alpha = \frac{12}{\sqrt{2581}}$$

$$\cos \beta = \frac{6}{\sqrt{2581}}$$

$$\cos \beta = \frac{6}{\sqrt{2581}}$$

$$\cos \gamma = \frac{-49}{\sqrt{2581}}$$



$$\begin{array}{c}
 \text{1. } A \cdot x + B \cdot y = C \\
 0.5x + 1.5y = 4 \\
 1.5x + 4.5y = 12
 \end{array}$$

$$1 \cdot \begin{bmatrix} 0.5 \\ 1.5 \end{bmatrix} = 0.5 \cdot \begin{bmatrix} 1 \\ 3 \end{bmatrix} + 1 \cdot \begin{bmatrix} 1 \\ 1 \end{bmatrix}$$

$$1 \cdot [0.5 + 1.5] = 0.5 [1.5 + 4.5] + 1 \cdot [1.5 = 4]$$

$$1 \cdot [2] = 0.5 [6] + 1 \cdot [1]$$

$$2 = 3 + 1$$

$$A \cdot x + B \cdot y = C \quad \begin{array}{c} 1 \quad 3 \quad 1 \\ 2 \quad 1 \quad 0 \\ 3 \quad 1 \quad 1 \end{array}$$

$$1 \cdot \begin{bmatrix} 1 \\ 3 \end{bmatrix} = 0.5 \cdot \begin{bmatrix} 2 \\ 3 \end{bmatrix} + 1 \cdot \begin{bmatrix} 1 \\ 1 \end{bmatrix}$$

$$1 \cdot [-8 = 0] = 0.5 [16 = 0] + 1 \cdot [-11 = -10 = -1]$$

$$1 \cdot [-8] = 0.5 [16] + 1 \cdot [-10]$$

$$-8 = 8 - 10$$



$$10 - (2A + D) \cdot (A \times 2D)$$

$$3A \times D \left| \begin{array}{ccc|c} i & j & k & \\ \hline 6 & -3 & 0 & \\ 3 & 1 & -11 & \end{array} \right.$$

$$A + 2D \left| \begin{array}{ccc|c} i & j & k & \\ \hline 2 & -1 & 0 & \\ 6 & 2 & -22 & \end{array} \right.$$

$$i \begin{bmatrix} -3 & 0 \\ 1 & -11 \end{bmatrix} - j \begin{bmatrix} 6 & 0 \\ 3 & -11 \end{bmatrix} + k \begin{bmatrix} 6 & -3 \\ 3 & 1 \end{bmatrix} \cdot i \begin{bmatrix} -1 & 0 \\ 2 & -22 \end{bmatrix} + j \begin{bmatrix} 2 & 0 \\ 6 & -22 \end{bmatrix} + k \begin{bmatrix} 2 & -1 \\ 0 & 2 \end{bmatrix}$$

$$i[33-0] - j[-66-0] + k[6+9] \cdot i[22-0] - j[-44-0] + k[4+6]$$

$$i[33] + j[-66] + k[15] \cdot i[22] - j[-44] + k[10]$$

$$33i + 66j + 15k \cdot 22i + 44j + 10k$$

$$3A \times D \cdot A + 2D = 26 + 2904 + 150 = \underline{3780}$$

$$v \quad A - 2D - C$$

$$2i - j - 3i - 2j + 22k - 4i + 4j - 5k$$

$$= -5i + j + \underline{17k}$$

2-co planar vectors are vectors which lie in the same plane formed by any 2 axes in the co-ordinate geometry.

Perpendicular vectors 2 vectors  $\vec{A}$  and  $\vec{B}$  are perpendicular if and only if their scalar product is  $= 0$