

Problem 2.2.16

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Question

Question:

The angle between the planes

$$\vec{r} \cdot (2\hat{i} - 3\hat{j} + \hat{k}) = 1 \text{ and}$$

$$\vec{r} \cdot (\hat{i} - \hat{j}) = 4$$

Solution

Solution:

Let P_1 and P_2 are the planes given respectively.

The normal vector of the planes, say n_1 and n_2 are:

$$\vec{n}_1 = \begin{pmatrix} 2 \\ -3 \\ 1 \end{pmatrix} \quad (3.1)$$

$$\vec{n}_2 = \begin{pmatrix} 1 \\ -1 \\ 0 \end{pmatrix} \quad (3.2)$$

Thus, the cosine of the angle between the two is

$$\cos\theta = \frac{\vec{n}_1 \cdot \vec{n}_2}{|\vec{n}_1||\vec{n}_2|} \quad (3.3)$$

$$= \frac{5}{\sqrt{14} \times \sqrt{2}} = \frac{5}{\sqrt{28}} \quad (3.4)$$

A,B and C are collinear

