

Exemplar Problem

Three Dimensional Geometry

45. The angle between the planes

$$\underline{r} = (2\hat{i} - 3\hat{j} + \hat{k}) = 1$$

and

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

is $\cos^{-1}\left(\frac{-5}{\sqrt{58}}\right)$.

Ans: The angle b/w two planes is $\cos\theta = \frac{n_1 \cdot n_2}{|n_1||n_2|}$

$$n_1 = 2\hat{i} - 3\hat{j} + \hat{k} \text{ and } n_2 = \hat{i} - \hat{j}$$

$$\text{So, } \cos\theta = \frac{2+3}{\sqrt{4+9+1}\sqrt{1+1}} = \frac{5}{2\sqrt{7}}$$

$$\theta = \cos^{-1}\left(\frac{5}{2\sqrt{7}}\right)$$

Thus the statement is False.