Related Questions with Solutions

Questions

Quetion: 01

A plane P_1 has the equation $2x - y + z = 4$ and the plane P_2 has the equation $x + ny + 2z = 11$. If the angle between P_1 and P_2 is $\frac{\pi}{3}$ then the value(s) of 'n' is (are)

A. 7/2

B. 17, – 1

C. –17, 1

D. –7/2

Solutions

Solution: 01

$P_1 : 2x - y + z = 4$
$P_2 : x + ny + 2z = 11$
$\vec{n}_1 = 2\hat{i} - \hat{j} + \hat{k}$
$\vec{n}_2 = \hat{i} + n\hat{j} + 2\hat{k}$
$\cos\dfrac{\pi}{3} = \dfrac{\vec{n}_1 \cdot \vec{n}_2}{|\vec{n}_1||\vec{n}_2|}$
$\dfrac{1}{2} = \dfrac{4-n}{\sqrt{6\left(5+n^2\right)}}$
$n^2 + 16n - 17 = 0$
$\qquad [n + 17][n - 1] = 0$
$\qquad n = -17, 1$

Correct Options

Answer:01
Correct Options: C