Related Questions with Solutions

Questions

Quetion: 01

The angle between the line $\frac{x+1}{3}=\frac{y-1}{2}=\frac{z-2}{4}$ and plane $2x+y-3z+4=0$ can be

A. $\arcsin\left(\frac{4}{406}\right)$

B. $\arccos\left(\frac{4}{406}\right)$

C. $\arctan\left(\frac{4}{406}\right)$

D. $\operatorname{arccot}\left(\frac{4}{406}\right)$

Solutions

Solution: 01

The given line is parallel to the vector $\vec{b}=3\hat{i}+2\hat{j}+4\hat{k}$ and the given plane is normal to the vector $\vec{n}=2\hat{i}+\hat{j}-3\hat{k}$. If θ is the acute angle between the line and plane, then $\sin\theta=\frac{|\vec{b}\cdot\vec{n}|}{|\vec{b}||\vec{n}|}=\frac{|(3\hat{i}+2\hat{j}+4\hat{k})\cdot(2\hat{i}+\hat{j}-3\hat{k})|}{\sqrt{3^2+2^2+4^2}\sqrt{2^2+1^2+3^2}}=\frac{|6+2-12|}{\sqrt{29}\sqrt{14}}=\frac{|-4|}{\sqrt{406}}\Rightarrow\theta=\arcsin\left(\frac{4}{406}\right)$

Correct Options

Answer:01

Correct Options: A