Vectors Q7 (3/7/23)

Find the angle between the planes $x = 2$ and $y + 2z = 3$

Solution

The two normal vectors are $\begin{pmatrix}1\\0\\0\end{pmatrix}$ & $\begin{pmatrix}0\\1\\2\end{pmatrix}$, and $\begin{pmatrix}1\\0\\0\end{pmatrix} . \begin{pmatrix}0\\1\\2\end{pmatrix} = 0$,

so that $cos\theta = 0$ (where θ is the angle between the normals), and hence the planes are perpendicular.

[The plane $x = 2$ is parallel to $x = 0$; ie the y-z plane. The plane

$y + 2z = 3$ can be formed from the line $y + 2z = 3$ in the y-z plane, extended in the positive and negative x directions (ie perpendicular to the y-z plane.]