ASSIGNMENT 5

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Download all python codes from

https://github.com/ponnaboinakalpana12/ASSIGNMENT5/ASSIGNMENT5.py

and latex-tikz codes from

https://github.com/ponnaboinakalpana12/ASSIGNMENT5/ASSIGNMENT5.tex

1 Question No 2.43c

In the following case, determine whether the given planes are parallel or perpendicular, and in case they are neither, find the angle between them.

1) $\begin{pmatrix}2 & -2 & 4\end{pmatrix}\mathbf{x} = -5$ and $\begin{pmatrix}3 & -3 & 6\end{pmatrix}\mathbf{x} = 1$

2 Solution:

1) Given that,

$$\mathbf{a} = \begin{pmatrix}2 & -2 & 4\end{pmatrix}, \mathbf{b} = \begin{pmatrix}3 & -3 & 6\end{pmatrix} \tag{2.0.1}$$

2) The given plans are parallel if,

$$\frac{a_1}{b_1} = \frac{a_2}{b_2} = \frac{a_3}{b_3} \tag{2.0.2}$$

3) The given planes are perpendicular if,

$$a.b = 0 \tag{2.0.3}$$

4) Find out the given planes are parallel or perpendicular:
Now using, (2.0.1) and (2.0.2)

$$\frac{a_1}{b_1} = \frac{a_2}{b_2} = \frac{a_3}{b_3} \implies \frac{2}{3} = \frac{-2}{-3} = \frac{4}{6} \tag{2.0.4}$$

$$\implies \frac{2}{3} = \frac{2}{3} = \frac{2}{3} \tag{2.0.5}$$

The given planes are parallel. So the angle between 0°.

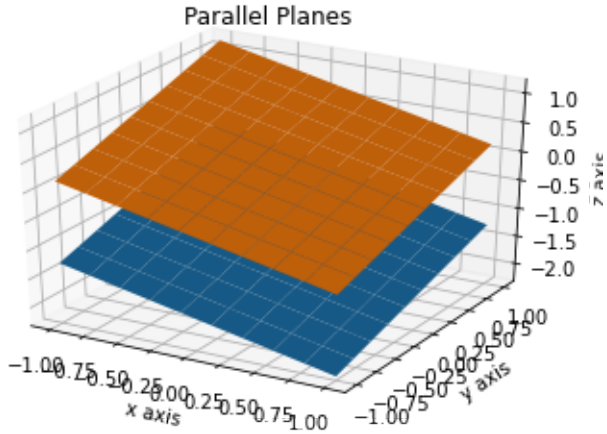

Fig. 2.1: Parallel planes