ASSIGNMENT-7

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Download all python codes from

https://github.com/balumurisandhyarani550/Assignment−7/blob/main/Assignment−7.py

Latex-tikz codes from

https://github.com/balumurisandhyarani550/Assignment−7/blob/main/main.tex

1 QUESTION No-2.28(VECTORS)

Find the ratio in which the line segment joining the points $\begin{pmatrix}4\\8\\10\end{pmatrix}$ and $\begin{pmatrix}6\\10\\-8\end{pmatrix}$ is divided by YZ-plane.

2 SOLUTION

1) Given

$$\mathbf{A} = \begin{pmatrix}4\\8\\10\end{pmatrix}, \mathbf{B} = \begin{pmatrix}6\\10\\-8\end{pmatrix} \tag{2.0.1}$$

Let the corresponding points on the YZ axis be $\begin{pmatrix}0\\x\\y\end{pmatrix}$

If the ratio be $k:1$

using,

$$\mathbf{C} = \frac{k\left(B\right)+\left(A\right)}{(k+1)} \tag{2.0.2}$$

the coordinates are (2.0.1),

$$\begin{pmatrix}0\\x\\y\end{pmatrix} = k\begin{pmatrix}6\\10\\-8\end{pmatrix} + 1\begin{pmatrix}4\\8\\10\end{pmatrix} \tag{2.0.3}$$

$$\tag{2.0.4}$$

As this is divided YZ plane, x-coordinate will zero.

$$0 = 6k + 4 \tag{2.0.5}$$

$$6k = -4 \tag{2.0.6}$$

$$k = \frac{-4}{6} \tag{2.0.7}$$

$$k = \frac{-2}{3} \tag{2.0.8}$$

$$\tag{2.0.9}$$

So, required ratio is 2:3 and line segment is divided externally.

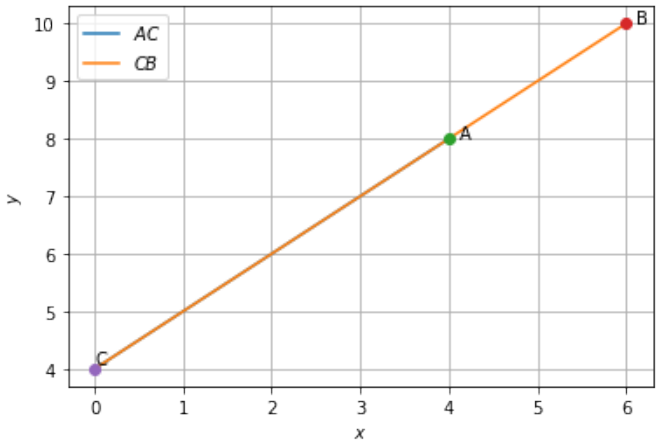

Fig. 2.1: EXTERNALLY