1-1.5-19

EE24BTECH11003 - Akshara Sarma Chennubhatla

Question:

Find the ratio in which the segment joining the points $(1, 3)$ and $(4, 5)$ is divided by the X axis. Also find the coordinates of this point on the X axis. Using section formula,

Solution:

Variable	Description
$\vec{P}$	Point on the X-axis
$\vec{A}$	$\begin{pmatrix}1\\3\end{pmatrix}$ point
$\vec{B}$	$\begin{pmatrix}4\\5\end{pmatrix}$ point
$\vec{k}$	ratio in which P divides AB to be found

TABLE 0
VARIABLES USED

$$\begin{pmatrix}x\\0\end{pmatrix} = \frac{\begin{pmatrix}1\\3\end{pmatrix} + k\begin{pmatrix}4\\5\end{pmatrix}}{1+k} \tag{0.1}$$

$$\implies \frac{5k+3}{k+1} = 0 \tag{0.2}$$

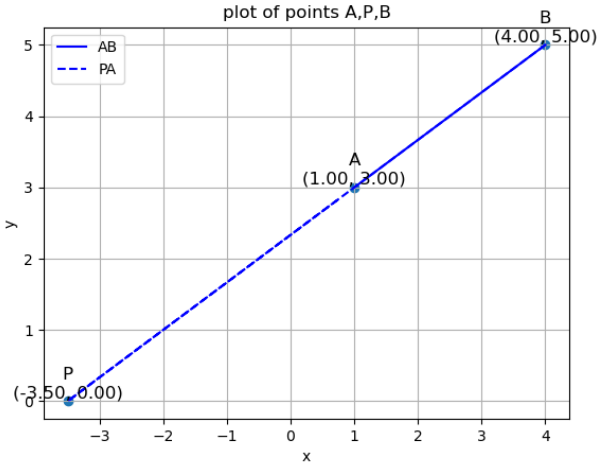
$$\implies k = \frac{-3}{5} \tag{0.3}$$

$$x = \frac{1}{k+1} + \frac{4k}{k+1} \tag{0.4}$$

$$\implies x = \frac{1 + 4\left(\frac{-3}{5}\right)}{\left(\frac{-3}{5}\right) + 1} \tag{0.5}$$

$$\implies x = \frac{-7}{2} \tag{0.6}$$

Therefore the ratio in which the line segment joining the points $(1, 3)$ and $(4, 5)$ is divided by the X axis is $-3 : 5$. The point on the X axis which divides the line segment in the ratio is $\left(\frac{-7}{2}, 0\right)$


plot of points A,P,B
AB
PA
B
(4.00, 5.00)
A
(1.00, 3.00)
P
(-3.50, 0.00)
x
y