

1-1.9-26

EE24BTECH11006 - Arnav Mahishi

Q) Find the value of k , if the point $P(2,4)$ is equidistant from the points $A(5,k)$ and $B(k,7)$.

Point	X	Y
P	2	4
A	5	k
B	k	7

TABLE 0: Input Parameters

$$\|AP\| = \|PB\| \implies (A - P)^T (A - P) = (B - P)^T (B - P) \quad (0.1)$$

$$\begin{pmatrix} 3 \\ k-4 \end{pmatrix}^T \begin{pmatrix} 3 \\ k-4 \end{pmatrix} = \begin{pmatrix} k-2 \\ 3 \end{pmatrix}^T \begin{pmatrix} k-2 \\ 3 \end{pmatrix} \quad (0.2)$$

$$(3 \quad k-4) \begin{pmatrix} 3 \\ k-4 \end{pmatrix} = (k-2 \quad 3) \begin{pmatrix} k-2 \\ 3 \end{pmatrix} \quad (0.3)$$

$$(k-4)^2 + 9 = (k-2)^2 + 9 \quad (0.4)$$

$$(k-4) = \pm (k-2) \quad (0.5)$$

$$\therefore k = 3 \quad (0.6)$$

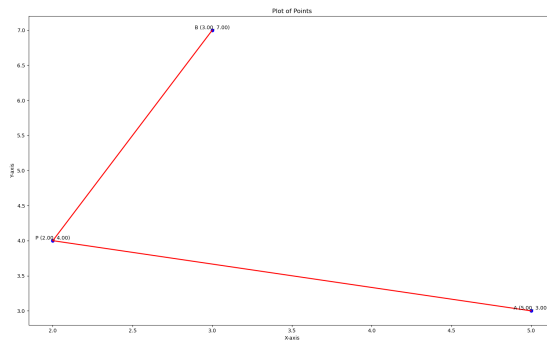


Fig. 0.1: Plot of points