DISCRETE 1-1.5-8

EE24BTECH11029 - J.SHRETHAN REDDY*

Question

Find the ratio in which $P\left(4,5\right)$ divides the line segment joining $A\left(2,3\right)$ and $B\left(7,8\right)$

Solution: Table

points	description	formula
$A\,(2,3)$	one end of line segment	–
$B\,(7,8)$	another end of line segment	–
$P\,(4,5)$	divides A and B in the ratio $k:1$	$P=\frac{A+kB}{k+1}$

Table: Variables Used

Theory

$$P = \frac{\mathbf{A}}{k+1} + \frac{k\mathbf{B}}{k+1} \tag{1}$$

$$\implies p = \begin{pmatrix} \mathbf{A} & \mathbf{B} \end{pmatrix} \begin{pmatrix} \frac{1}{k+1} \\ \frac{k}{k+1} \end{pmatrix} \tag{2}$$

Theory

$$from(2) \tag{3}$$

$$\implies \begin{pmatrix} 4 \\ 5 \end{pmatrix} = \begin{pmatrix} 2 & 7 \\ 3 & 8 \end{pmatrix} \begin{pmatrix} \frac{1}{k+1} \\ \frac{k}{k+1} \end{pmatrix} \tag{4}$$

$$\implies \begin{pmatrix} 4 \\ 5 \end{pmatrix} = \begin{pmatrix} \frac{2}{k+1} + \frac{7k}{k+1} \\ \frac{3}{k+1} + \frac{8k}{k+1} \end{pmatrix} \tag{5}$$

$$\implies 4 = \frac{2+7k}{k+1} \tag{6}$$

$$\implies 4k + 4 = 2 + 7k \tag{7}$$

$$3k = 2 \tag{8}$$

$$k = \frac{2}{3} \tag{9}$$

$$\tag{10}$$

Theory

$$k : 1 = \frac{2}{3} : 1 \tag{11}$$

C-Code

C-Code

c code output

2 : 3

Python Code

Python Code

Python Code

Python Code

Figure

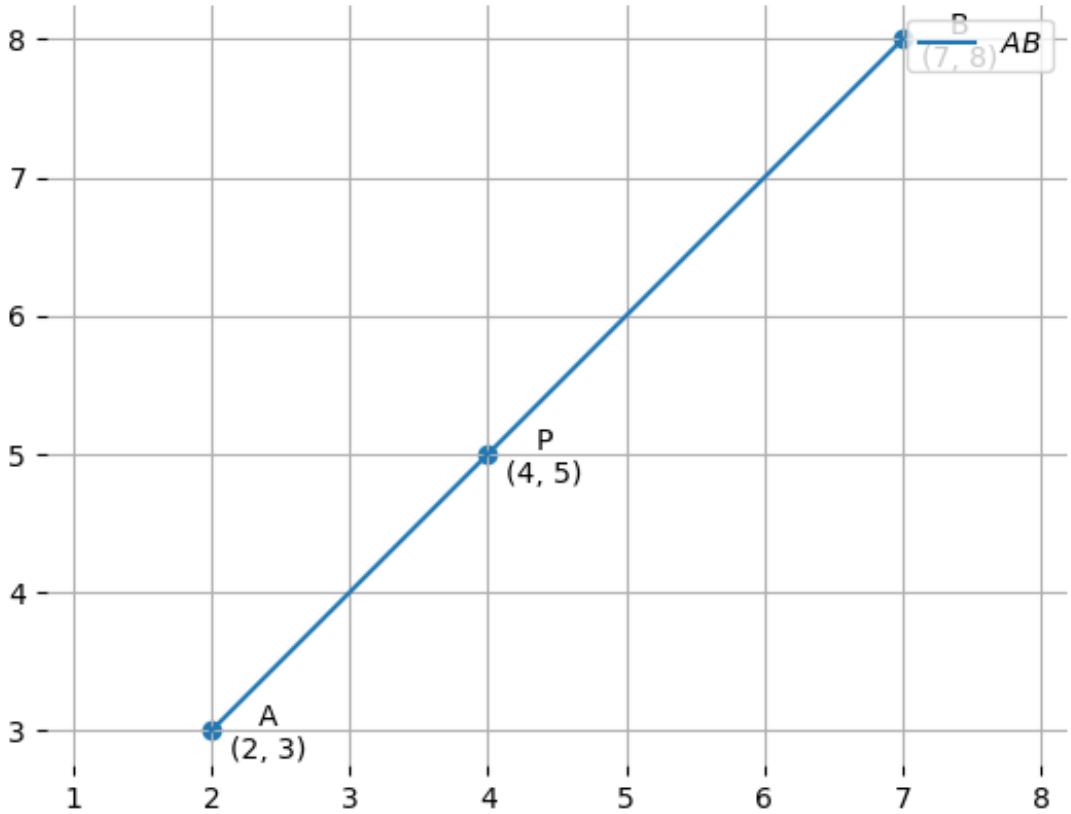

Figure: P divides A and B in the ratio 2 : 3