

Assignment - 2

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Abstract—This is a simple document to learn about writing vectors and matrices using latex, draw figures using Python, Latex.

Download all and latex-tikz codes from

<https://github.com/Padmanabhk1/Assignment-2/tree/main>

1 VECTORS

(CBSE-MATH-X-2006-SET 1-Q.1)

- 1.1. Find the coordinates of the point which divides the line joining the points $\mathbf{A} = \begin{pmatrix} 1 \\ 3 \end{pmatrix}$ and $\mathbf{B} = \begin{pmatrix} 2 \\ 7 \end{pmatrix}$ in the ratio 3 : 4

Solution:

- a) Let point \mathbf{P} divide the line in the desired ratio.

$$\mathbf{P} = \begin{pmatrix} x \\ y \end{pmatrix} \quad (1.1.1)$$

$$\frac{AP}{PB} = \frac{3}{4} = \frac{k}{1} \quad (1.1.2)$$

\mathbf{P} is given by

$$\mathbf{P} = \left(\frac{k\mathbf{B} + \mathbf{A}}{k+1} \right) \quad (1.1.3)$$

$$= \frac{\frac{3}{4} \begin{pmatrix} 2 \\ 7 \end{pmatrix} + \begin{pmatrix} 1 \\ 3 \end{pmatrix}}{\frac{3}{4} + 1} \quad (1.1.4)$$

$$= \frac{\begin{pmatrix} \frac{3}{2} \\ \frac{21}{4} \end{pmatrix} + \begin{pmatrix} 1 \\ 3 \end{pmatrix}}{\frac{7}{4}} \quad (1.1.5)$$

$$= \begin{pmatrix} \frac{10}{7} \\ \frac{33}{7} \end{pmatrix} \quad (1.1.6)$$

is the point which divides the line joining the points $\mathbf{A} = \begin{pmatrix} 1 \\ 3 \end{pmatrix}$ and $\mathbf{B} = \begin{pmatrix} 2 \\ 7 \end{pmatrix}$ in the ratio 3 : 4.

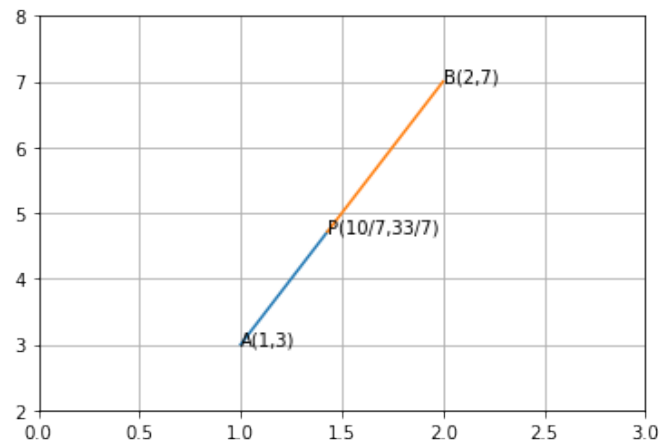


Fig. 1.1. Line division