Assignment - 1

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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

svn co https://github.com/MVKKanth/Assignment −1

question taken from

1 Vectors

(cbse/math/10/2008/qp−math−x−2008.pdf Code 30/2/1 − Q21)}

1.1. If **P** divides the join of $\mathbf{A}\begin{pmatrix}-2\\-2\end{pmatrix}$ and $\mathbf{B}\begin{pmatrix}2\\-4\end{pmatrix}$ such that $\frac{\mathbf{AP}}{\mathbf{AB}} = \frac{3}{7}$, find the coordinates of **P**.

Solution:

a) Let point **P** divide the line in the desired ratio.

$$\mathbf{P} = \begin{pmatrix}x\\y\end{pmatrix} \tag{1.1.1}$$

$$\frac{AP}{PB} = \frac{3}{4} = \frac{k}{1} \tag{1.1.2}$$

P is given by

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

$$= \frac{\frac{3}{4}\begin{pmatrix}2\\-4\end{pmatrix} + \begin{pmatrix}-2\\-2\end{pmatrix}}{\frac{3}{4}+1} \tag{1.1.4}$$

$$= \frac{\begin{pmatrix}\frac{6}{4}\\\frac{-12}{4}\end{pmatrix} + \begin{pmatrix}-2\\-2\end{pmatrix}}{\frac{7}{4}} \tag{1.1.5}$$

$$= \frac{4}{7}\begin{pmatrix}\frac{-2}{4}\\\frac{-20}{4}\end{pmatrix} \tag{1.1.6}$$

$$= \begin{pmatrix}\frac{-2}{7}\\\frac{-20}{7}\end{pmatrix} \tag{1.1.7}$$

$$\tag{1.1.8}$$

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

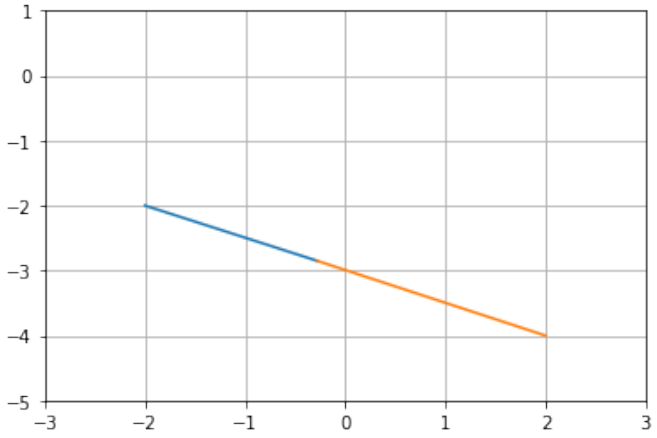

Fig. 1.1. Two lines representing given equations meet at (-2/7, -20/7)