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

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

We have

$$\mathbf{A} = \begin{pmatrix}-2\\-2\end{pmatrix}, \mathbf{B} = \begin{pmatrix}2\\-4\end{pmatrix} \tag{1.1.2}$$

and

$$\frac{AP}{AB} = \frac{3}{7} \tag{1.1.3}$$

$$\implies \frac{AP}{PB} = \frac{3}{4} \tag{1.1.4}$$

$$\tag{1.1.5}$$

So, the coordinates of the point

$$\mathbf{P}\begin{pmatrix}x\\y\end{pmatrix} \tag{1.1.6}$$

which divides the line segment joining the points

$$\mathbf{A}\begin{pmatrix}x1 & y1\end{pmatrix} \tag{1.1.7}$$

$$\mathbf{B}\begin{pmatrix}x2 & y2\end{pmatrix} \tag{1.1.8}$$

internally, in the ratio m1 : m2 are

$$\frac{(m1x2 + m2x1)}{(m1 + m2)}, \frac{(m1y2 + m2y1)}{(m1 + m2)} \tag{1.1.9}$$

This is known as the section formula.

Given

$$\mathbf{m1} : \mathbf{m2} = 3 : 4 \tag{1.1.10}$$

$$\mathbf{p}\begin{pmatrix}x & y\end{pmatrix} = \left(\frac{3(2)+4(-2)}{4+3}, \frac{3(-4)+4(-2)}{4+3}\right) \tag{1.1.11}$$

$$\implies \left(\frac{-2}{7} \frac{-20}{7}\right) \tag{1.1.12}$$

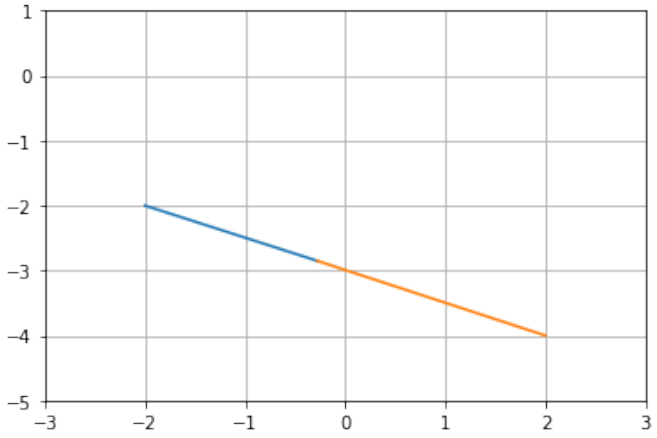

Fig. 1.1. Two lines representing given equations meet at point $\left(\frac{-2}{7} \quad \frac{-20}{7}\right)$.