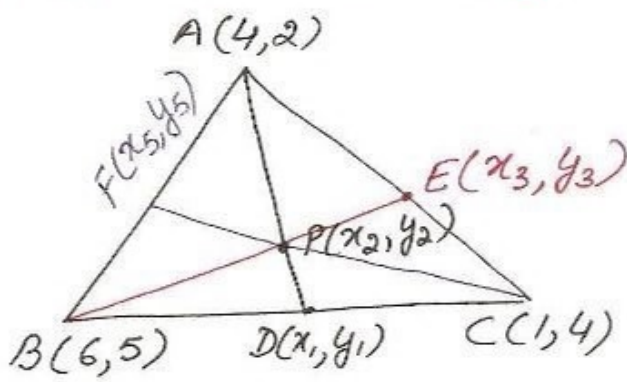


(7)



(i) D is midpt of BC

$$\therefore x_1 = \frac{6+1}{2}, y_1 = \frac{5+4}{2}$$

$$= \frac{7}{2} \quad = \frac{9}{2}$$

$$\therefore D\left(\frac{7}{2}, \frac{9}{2}\right)$$

(ii) AP:PD = 2:1

$$x_2 = \frac{7+4}{2+1}, y_2 = \frac{9+2}{2+1}$$

$$= \frac{11}{3} \quad = \frac{11}{3}$$

$$P\left(\frac{11}{3}, \frac{11}{3}\right)$$

(iii) E is midpt of AC

$$\therefore x_3 = \frac{4+1}{2}, y_3 = \frac{2+4}{2}$$

$$= \frac{5}{2} \quad = \frac{6}{2}$$

$$= 3$$

$$E\left(\frac{5}{2}, 3\right)$$

Pt Q(x4, y4) divides

BE in ratio 2:1

$$x_4 = \frac{5+6}{3}, y_4 = \frac{6+5}{3}$$

$$= \frac{11}{3} \quad = \frac{11}{3}$$

F is midpoint of AB

$$\therefore x_5 = \frac{4+6}{2}, y_5 = \frac{2+5}{2}$$

$$= 5 \quad = \frac{7}{2}$$

$$\therefore F\left(5, \frac{7}{2}\right)$$

R(x6, y6) divides CF in ratio 2:1

$$\therefore x_6 = \frac{10+1}{2+1}, y_6 = \frac{7+4}{2+1}$$

$$= \frac{11}{3} \quad = \frac{11}{3}$$

$$\therefore R\left(\frac{11}{3}, \frac{11}{3}\right)$$

(iv) P, Q, R have same coordinates
 \therefore they represent same point

(v) let G(x7, y7)

$$x_7 = \frac{x_1+x_2+x_3}{3}$$

$$y_7 = \frac{y_1+y_2+y_3}{3}$$

\therefore coordinates of centroid are

$$\left(\frac{x_1+x_2+x_3}{3}, \frac{y_1+y_2+y_3}{3}\right)$$