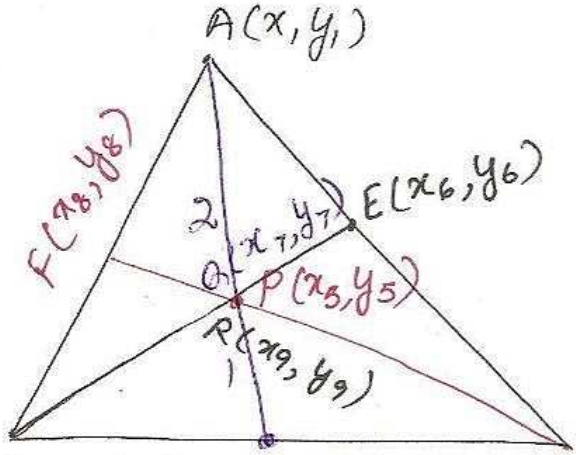
(3)



D is midpoint of BC

$\therefore x_4 = \frac{x_2+x_3}{2}$, $y_4 = \frac{y_2+y_3}{2}$

$\therefore D\left(\frac{x_2+x_3}{2}, \frac{y_2+y_3}{2}\right)$

AP : PD = 2 : 1

$x_5 = \frac{2x_4 + x_1}{3}$,

$= \frac{2\left(\frac{x_2+x_3}{2}\right) + x_1}{3}$

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

$y_5 = \frac{2y_4+y_1}{3}$

$= \frac{2\left(\frac{y_2+y_3}{2}\right) + y_1}{3}$

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

E is midpoint of CA

$\therefore x_6 = \frac{x_1+x_3}{2}$, $y_6 = \frac{y_1+y_3}{2}$

NCERT Exemplar Sols by Dev Anoop (Bathinda)

BQ : QE = 2 : 1, let Q (x_7, y_7)

$x_7 = \frac{2\left(\frac{x_1+x_3}{2}\right) + x_2}{3}$

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

$y_7 = \frac{2\left(\frac{y_1+y_3}{2}\right) + y_2}{3}$

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