CHAPTER-7
COORDINATE GEOMETRY

Excercise 7.4

1. Determine the ratio in which the line $2x + y - 4 = 0$ divides the line segment joining the points $\vec{A}(2, -2)$ and $\vec{B}(3, 7)$.

2. Find a relation between x and y if the points $(x, y), (1, 2)$ and $(7, 0)$ are collinear.

3. Find the centre of a circle passing through the points $(6, -6), (3, -7)$ and $(3, 3)$.

4. The two opposite vertices of a square are $(-1, 2)$ and $(3, 2)$. Find the coordinates of the other two vertices.

5. The Class X students of a secondary school in Krishinagar have been allotted a rectangular plot of land for their gardening activity. Sapling of Gulmohar are planted on the boundary at a distance of 1m from each other. There is a triangular grassy lawn in the plot as shown in fig.1. The students are to sow seeds of flowering plants on the remaining area of the plot.

   (a) Taking A as origin, find the coordinates of the vertices of the triangle.

   (b) What will be the coordinates of the vertices of $\triangle$ PQR if C is the origin?
   Also calculate the areas of the triangles in these cases. What do you observe?

6. The vertices of a $\triangle$ABC are $\vec{A}(4, 6), \vec{B}(1, 5)$ and $\vec{C}(7, 2)$. A line is drawn to intersect sides AB and AC at D and E respectively, such that $\frac{AD}{AB} = \frac{AE}{AC} = \frac{1}{4}$. Calculate the area of $\triangle$ADE and compare it with the area of the $\triangle$ABC.

7. Let $\vec{A}(4, 2), \vec{B}(6, 5)$ and $\vec{C}(1, 4)$ be the vertices of $\triangle$ABC.

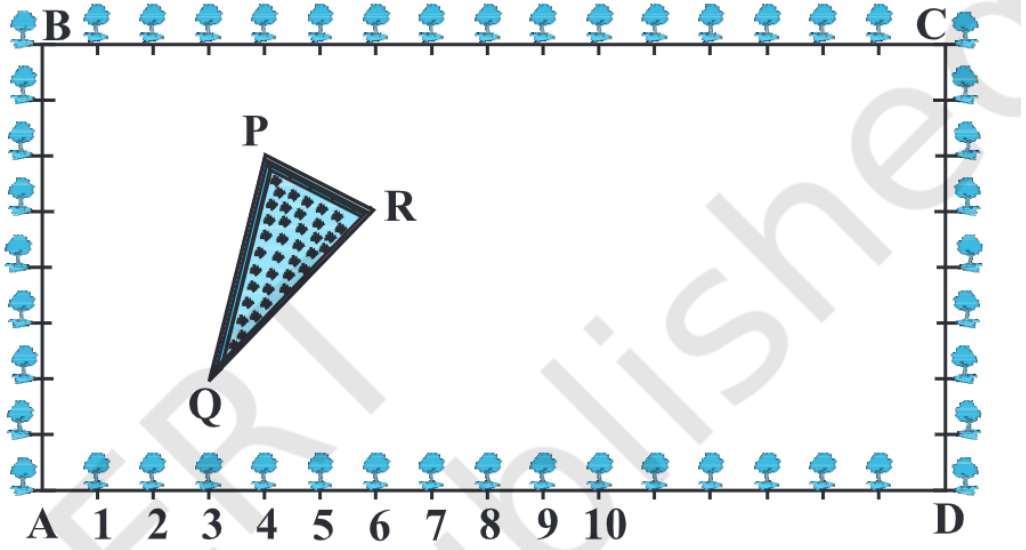

Figure 1:

(a) The median from A meets BC at D. Find the coordinates of the point D.

(b) Find the coordinates of the point P on AD such that $AP : PD = 2 : 1$

(c) Find the coordinates of points Q and R on medians BE and CF respectively such that $BQ : QE = 2 : 1$ and $CR : RF = 2 : 1$.

(d) What do yo observe?
Note : The point which is common to all the three medians is called the centroid and this point divides each median in the ratio $2 : 1$.
If $A(x_1, y_1), B(x_2, y_2)$ and $C(x_3, y_3)$ are the vertices of $\triangle$ABC, find the coordinates of the centroid of the triangle.

8. ABCD is a rectangle formed by the points $\vec{A}(-1, -1), \vec{B}(-1, 4), \vec{C}(5, 4)$ and $\vec{D}(5, -1)$.

P, Q, R and S are the mid-points of AB, BC, CD and DA respectively. Is the quadrilateral PQRS a square? a rectangle? or a rhombus? Justify your answer.