MATHS

BOOKS - PSEB

COORDINATE GEOMETRY

Exercise

1. Find the distance between the following pairs of points : (2, 3),(4, 5)

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2. Find the distance between the following pairs of points : (- 5, 7) ,(- 1, 3).

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3. Find the distance between the following pairs of points : (a, b) , (- a,- b).

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4. Find the distance between the points (0, 0) and (36, 15), Can you now find the distance between the two towns A and B discussed in Section 7.2.

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5. Determine if the points (1, 5), (2, 3) and (- 2,-11) are collinear.
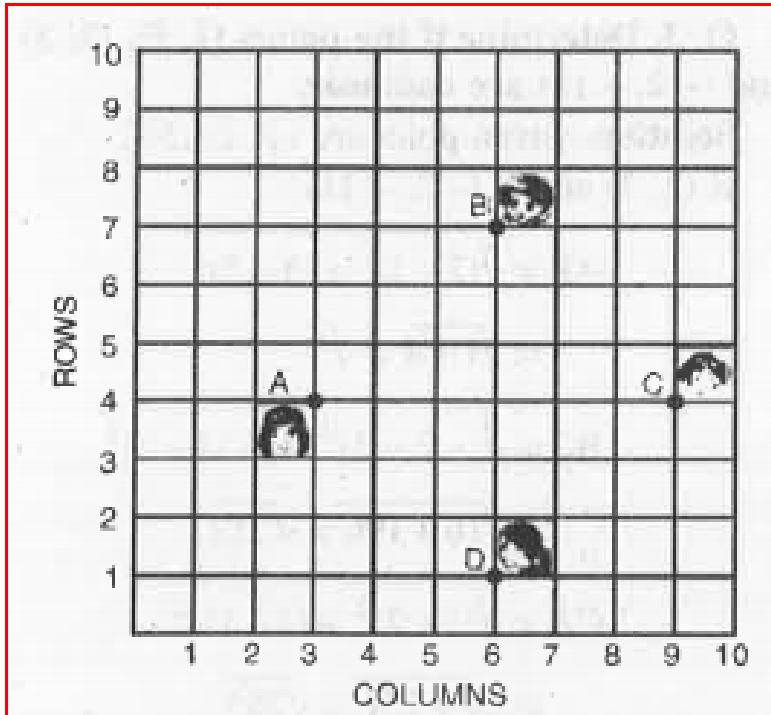
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6. Check whether (5,- 2) , (6, 4) and (7, -2) are the vertices of an isosceles triangle.

7. In a classroom, 4 friends are seated at the points A, B, C and D as shown in fig. Champa and Chameli walk into the class and after observing for a few minutes Champa asks Chameli, "Don't you think ABCD is a square" ? Chameli disagrees. Using distance formula,

find which of them is correct, and why ?

8. Name the type of quadrilateral formed, if any, by the following points, and give reasons for your answer :- (- 1,- 2), (1, 0), (- 1, 2), (- 3, 0).

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9. Name the type of quadrilateral formed, if any, by the following points, and give reasons for your answer :- (- 3, 5), (3, 1), (0, 3), (- 1,-4).

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10. Name the type of quadrilateral formed, if any, by the following points, and give reasons for your answer :- (4, 5), (7, 6), (4, 3), (1, 2).

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11. Find the points on the x-axis which is equidistant from (2,- 5) and (- 2, 9).

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12. Find the values of y for which the distance between the points P (2, - 3) and Q (10, y) is 10 units.

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13. If Q(0,1)is equidistantfrom P(5,- 3) and R (x, 6),find the values of x.Also find the distances QR and PR.

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14. Find a relation between x and y such that the point (x, y) is equidistant from the point (3, 6) and (- 3, 4).

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15. Find the coordinates of the point which divides the join of (-1, 7) and (4, -3) in the ratio 2 :3.

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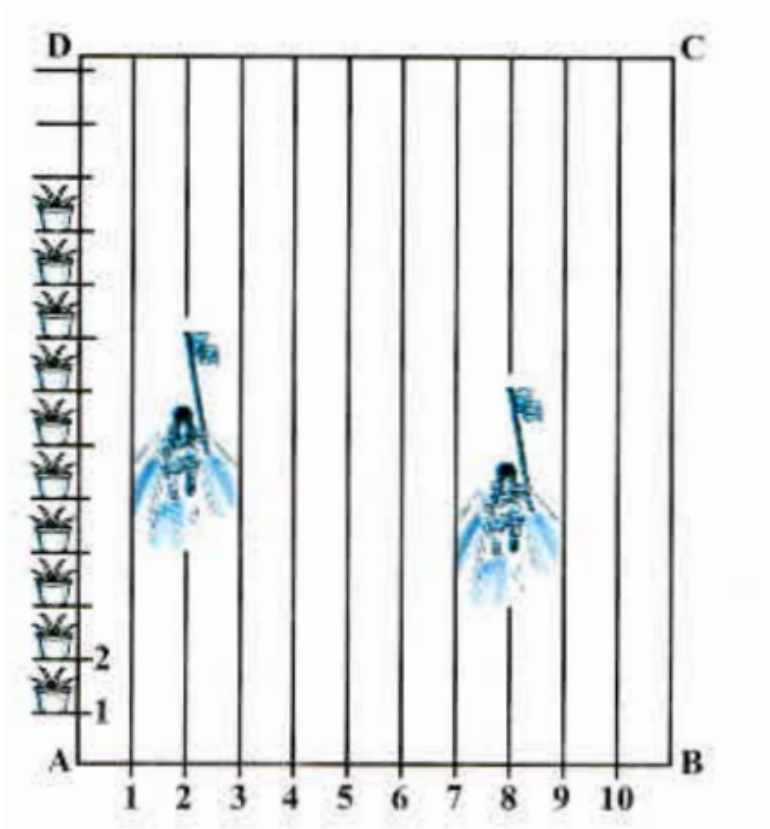**16.** Find the coordinates of the points of trisection of the line segment joining (4, -1) and (-2,-3).

17. To conduct Sports Day activities, in your rectangular shaped school ground ABCD, lines have been drawn with chalk powder at a distance of 1m each. 100 Flower pots have been placed at a distance of 1m from each other along AD, as shown in Fig. 7. 12. Niharika

runs 1/4 th the distance AD on the 2nd line and posts a green flag. Preet runs 1/5th the distance AD on the eighth line and posts a red flag. What is the distance between both the flags? If Rashmi has to post a blue flag exactly halfway between the line segment joining the

two flags, where should she post her flag?

18. Find the ratio in which the segment joining the points(-3, 10) and (6,-8) is divided by (- 1, 6).

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19. Find the ratio in which the line segment joining A (1,- 5) and B (- 4, 5) is divided by the x-axis. Also find the co ordinates of the point of division.

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20. If (1, 2) , (4, y) , (x, 6) and (3, 5) are the vertices of a parallelogram taken inorder, find x and y.

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21. Find the coordinates of a point A, where AB is the diameter of a circle whose centre is (2,-3) and B is (1, 4).

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22. If A and B are (- 2,- 2) and (2,- 4) respectively, find the coordinates of P such that $AP=\dfrac{3}{7}$ AB and Pliesin the line segment AB.

23. Find the coordinates of the points which divides the line segment joining A (- 2, 2) and B (2, 8) into four equal parts.

24. Find the area of a rhombus if the vertices are (3, 0) , (4, 5) ,(- 1, 4) and(— 2,- 1) taken in order.

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25. Find the area of the triangle whose vertices are :- (2, 3), (-1, 0), (2,- 4).

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26. Find the area of the triangle whose vertices are :- (- 5, -1), (3,- 5), (5, 2).

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27. In each of the following find the value of 'k' for which the points are eollinear.,- (7, - 2), (5, 1), (3, k).

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28. In each of the following find the value of 'k' for which the points are collinear. (8,1) , (k,-4), (2,-5).

29. Find the area of the triangle formed by joining the mid-points of the sides of the triangle whose vertices are (0, -1), (2, 1) and (0, 3). Find the ratio of the area of the triangle formed to the area of the given triangle

30. Find the area of the quadrilateral whose vertices taken in order, are (-4, - 2), (-3,-5), (3, -2),(2,3).

31. You have studied in Class IX, (Chapter 9, Example 3), that a median of a triangle divides it into two triangles of equal areas. Verify this

result for $\triangle ABC$ whose vertices are A(4,-6), B(3,-2) and C(5, 2).

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

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

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

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

36. 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 lm from each

other. There is a triangular grassy lawn in the plot as shown in the Fig. The students are to sow seeds of flowering plants on the remaining area of the plot.:- Taking A as origin find the coordinates of the vertices of triangle .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 ?
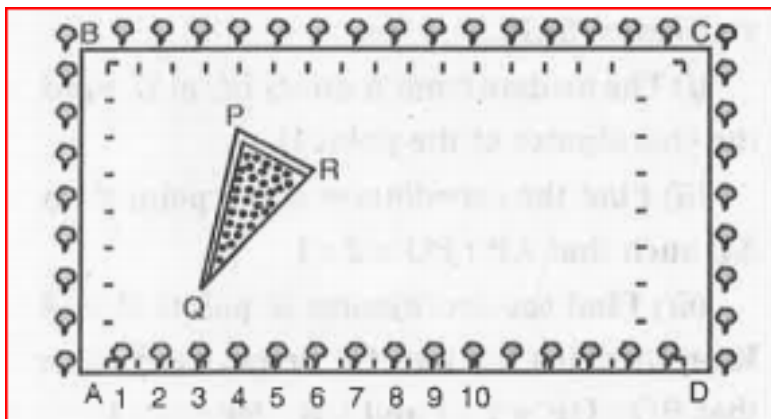
37. The vertices of a $\triangle ABC$ are A(4,6), B(l,5) and C(7, 2). A line is drawn to intersect sides AB and AC at D and E respectively,such that $\dfrac{AD}{AB} = \dfrac{AE}{AC} = \dfrac{1}{4}$. Calculate the area of the $\triangle ADE$ and compare it with the area of $\triangle ABC$.

38. Let (4, 2), B (6, 5) and C (1, 4) be the vertices of $\triangle ABC$. :- The median from A meets BC at D. Find the coordinates of the point D.

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39. Let A (4, 2), B (6, 5) and C (1, 4) be the vertices of $\triangle ABC$. :- Find the coordinates of the point P on AD such that AP : PD = 2:1

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40. Let (4, 2), B (6, 5) and C (1, 4) be the vertices of $\triangle ABC$. :- 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.

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41. Let A(4, 2), B (6, 5) and C (1, 4) be the vertices of $\triangle ABC$. :- If (x_1, y_1) , B (x_2, y_2) and C(x_3, y_3) the vertices of $\triangle ABC$, find the coordinates of the centroid of the triangle.

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42. A (- 1, - 1), B (- 1, 4), C (5, 4) and 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

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Example

1. Do the points (3, 2), (-2, -3) and (2, 3) form a triangle? If so, name the type of triangle formed.

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2. Show that the points (1, 7), (4, 2), (-1,-1) and (-4, 4) are the vertices of a square.

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3. Fig. 7.6 shows the arrangement of desks in a classroom. Ashima, Bharti and Cainella are seated at A(3, 1). B(6, 4) and C(8, 6) respectively. Do you think they are seated in a line? Give reasons for your answer.
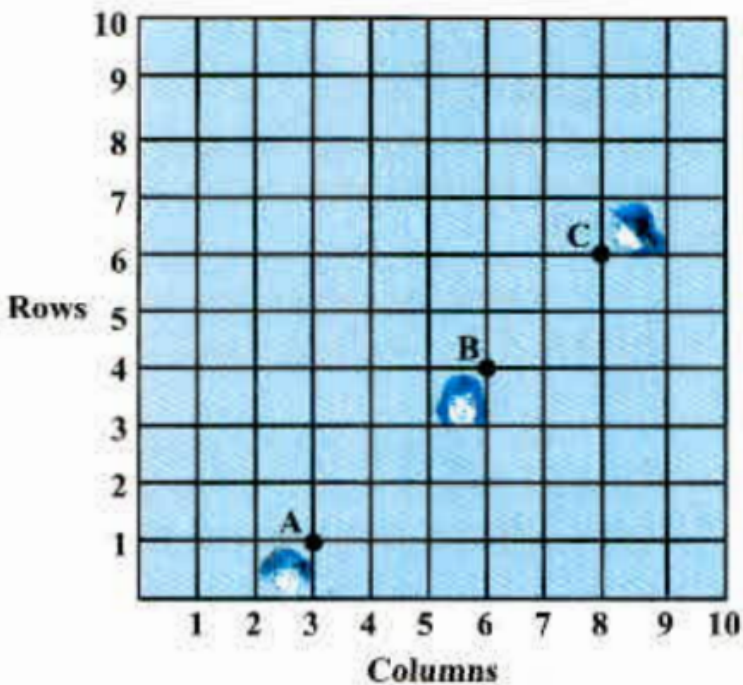

Fig. 7.6

4. Find a relation between x and y such that the point (x , y) is equidistant from the points (7, 1) and (3, 5) .

5. Find a point on the y-axis which is equidistant from the points A(6, 5) and B(-4, 3).

6. Find the coordinates of the point which divides the line segment joining ihe points (4,-3) and (8, 5) in the ratio 3 : 1 internally.

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7. In what ratio does the point (- 4, 6) divide the line segment joining the points A(- 6, 10) and B(3,- 8)?

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8. Find the coordinates of the points of trisection (i.e., points dividing in three equal parts) of the line segment joining the points A(2,- 2) and B(-7, 4).

9. Find the ratio in which the y-axis divides the line segment joining the points (5,-6) and (- 1, - 4). Also find the point of intersection.

10. If the points A(6, 1), B(8, 2), C(9, 4) and D(p, 3) are the vertices of a parallelogram, taken in order, find the value of p.

11. Find the area of a triangle whose vertices are (1, -1), (- 4, 6) and (-3, -5).

12. Find the area of a triangle formed by the points A(5, 2), B(4, 7) and C (7, - 4).

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13. Find the area of the triangle formed by the points P(-1.5, 3), Q(6,-2) and R(-3, 4).

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14. Find the value of k if the points A(2, 3), B(4, k) and C(6, -3) are collinear.

15. If A(-5, 7), B(- 4, -5), C(-1, -6) and D(4, 5) are the vertices of a quadrilateral, find the area of the quadrilateral ABCD,