MATHS

NCERT - NCERT MATHEMATICS(ENGLISH)

COORDINATE GEOMETRY

Exercise 7 2

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

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

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4. Find the coordinates of the points which divide the line segment joining $A(-2, 2)$ and $B(2, 8)$ into

four equal parts.

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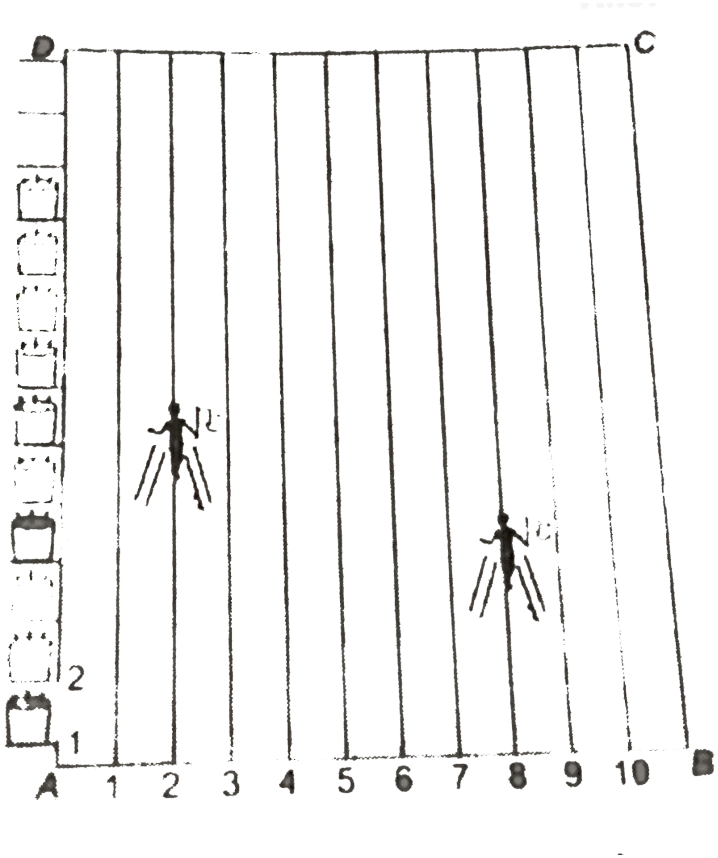
5. To conduct Sports Day activities, in your rectangular shaped school ground ABCD, lines have been drawn with chalk powder at a distance of 1 m each. 100 flower pots have been placed at a distance of 1 m from each other along AD, as shown in figure. Niharika runs $\frac{1}{4}$ th the distance AD on the 2nd line and posts a green flag. Preet runs $\frac{1}{5}$ th 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 ?



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

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

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9. 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 coordinates of the point of division.

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

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Exercise 7 4

1. ABCD is a rectangle formed by the points $A(1,\ 1)$, $B(1,\ 4)$, $C(5,\ 4)$ and $D(5,\ 1)$. P, Q, R and S are the midpoints 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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2. 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).

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


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


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

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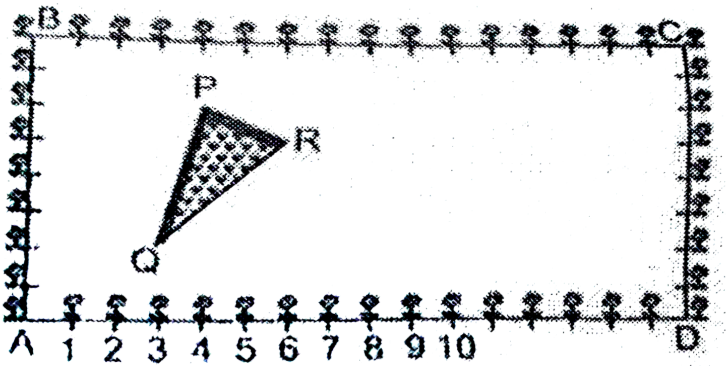
6. The Class X students of a secondary school in Krishinagar have been allotted a rectangular plot of land for their gardening activity. Sapling of Gulmohar are planted on the boundary at a distance of 1 m from each other. There is a triangular grassy lawn in the plot as shown in the Figure. The students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

of the plot.

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

(ii) What will be the coordinates of the vertices of DPQR if C is the origin? Also calculate the areas of the triangles in these cases. What do you observe?



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7. The vertices of a ΔABC are $A(4, 6)$, $B(1, 5)$ and $C(7, 2)$. 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 the ΔADE and compare it with the area of ΔABC

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8. Let A (4, 2), B(6, 5) and C(1, 4) be the vertices of ΔABC.

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

(ii) Find the coordinates of the point P on AD such

that AP : PD = 2 : 1

(iii) 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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Solved Examples

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

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

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4. 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.

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5. 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.

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

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7. 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* $B(7, 4)$.

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8. Find the ratio in which the y-axis divides the line segment joining the points $(5, -6)$ and $(-1, -4)$.

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

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11. In the seating arrangement of desks in a classroom three studens Rohini, Sandhya and Bina

are seated at $A(3, 1), B(6, 4) and C(8, 6)$. Do you think they are seated in al line?

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

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

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

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15. 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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Exercise 7 1

1. Find the point on the x-axis which is equidistant from $(2, -5)$ and $(-2, 9)$

A. $(-7, 0)$

B. $(7, 0)$

C. $(-2, 0)$

D. $(-9, 0)$

Answer: A

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2. Name the type of quadrilateral formed, if any, by the following points, and give reasons for your answer:

(i) $(-1, -2), (1, 0), (-1, 2), (-3, 0)$

(ii) $(-3, 5), (3, 1), (0, 3), (-1, -4)$

(iii) $(4, 5), (7, 6), (4, 3), (1, 2)$

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3. In a classroom, 4 friends are seated at the points A. B. C and D as shown in Fig. 7.8. 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.

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4. Check whether $(5, -2), (6, 4)$ and $(7, -2)$ are the vertices of an isosceles triangle.

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5. Determine if the points $(1, 5), (2, 3)$ and $(-2, -11)$ are collinear.

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6. Find the distance between the points (0, 0) and (36, 15).

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7. Find the distance between the following pairs of points :

(i) $(2, 3), (4, 1)$

(ii) $(-5, 7), (-1, 3)$

(iii) $(a, b), (-a, -b)$

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8. If Q(0, 1) is equidistant from $P(5,\ 3)$and R(x, 6), find the values of x. Also find the distances QR and PR.

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

A. $y = 9$

B. $y = -5$

C. $y = -3$

D. Both A and C

Answer: D

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

A. $3x - y - 5 = 0$

B. $3x + y + 5 = 0$

C. $3x + y - 5 = 0$

D. None

Answer: C

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Exercise 7 3

1. 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 Δ ABC whose vertices A(4, – 6), B(3, –2) and C(5, 2).

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

$(2, 3)$.

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3. Find the area of the triangle whose vertices are

(i) $(2, 3), (-1, 0), (2, -4)$

(ii) $(-5, -1), (3, -5), (5, 2)$

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4. 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 this area to the area of the given triangle.

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5. In each of the following find the value of k for which the points are collinear.

(i) $(7, -2), (5, 1), (3, k)$

(ii) $(8, 1), (k, -4), (2, -5)$

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