MATHS

BOOKS - MBD

COORDINATE GEOMETRY

Example

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

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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).

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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.

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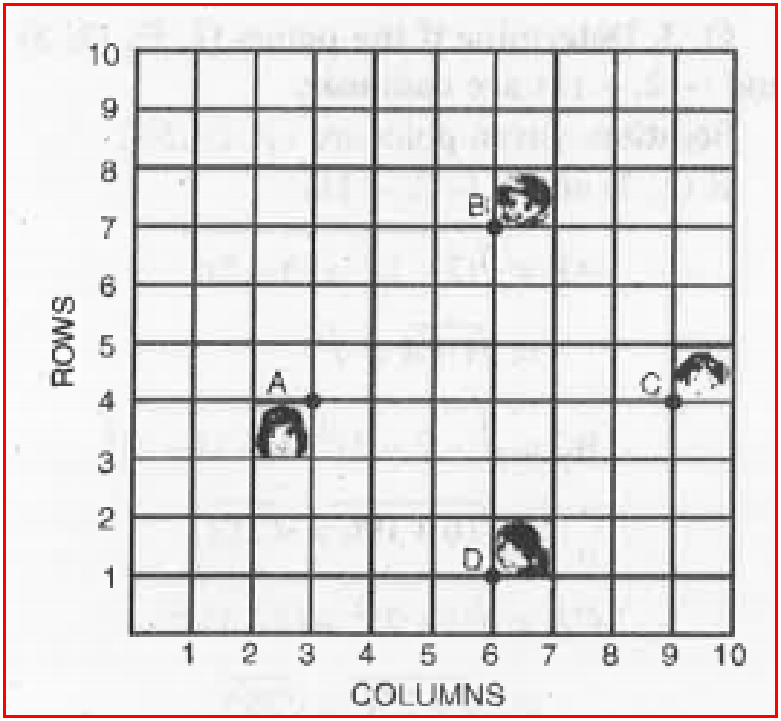
7. In a classroom, 4 friends are seated at the points A, B, C and D as shown in fig. Champa and Chameli walk into the class and after observing for a few minutes Champa asks Chameli, “Don’t you think ABCD is a square” ? Chameli disagrees. Using distance formula,

find which of them is correct, and why ?



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

15. 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.

16. 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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17. 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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18. If A and B are (- 2,- 2) and (2,- 4) respectively, find the coordinates of P such that AP=$\frac{3}{7}$ AB and Pliesin the line segment AB.

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

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

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

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

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25. 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

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


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


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

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

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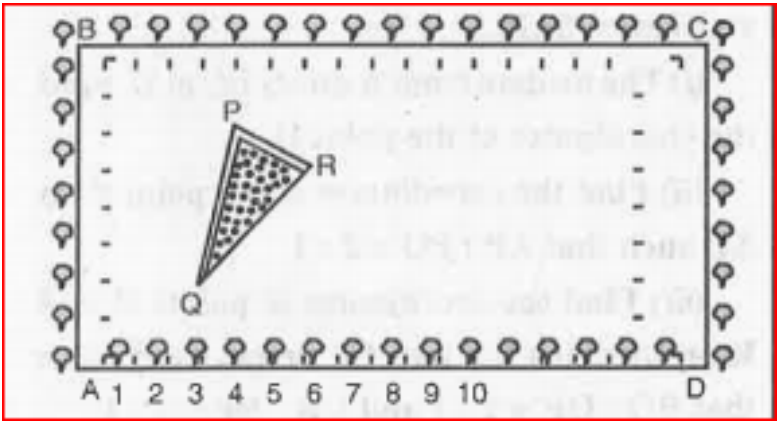
30. The Class X students of a secondary school in Krishinagar have been allotted a rectangular plot of land for their gardening activity. Sapling of Gulmohar are planted on the boundary at a distance of lm from each other. There is a triangular grassy lawn in the plot as shown in the Fig. The students 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 the

triangle.



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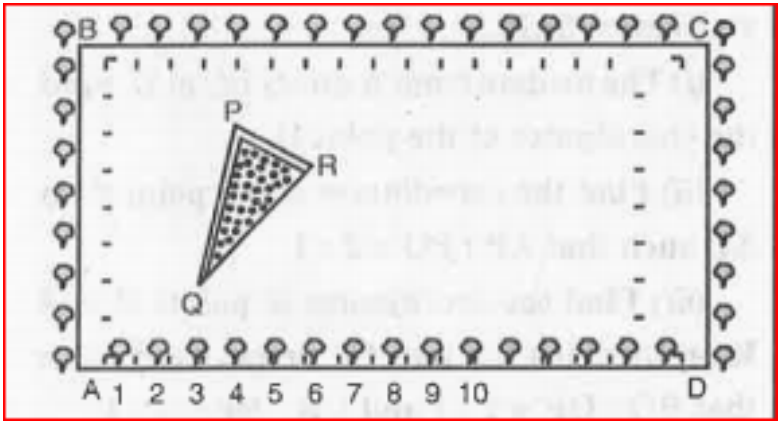
31. The Class X students of a secondary school in Krishinagar have been allotted a rectangular plot of land for their gardening activity. Sapling of Gulmohar are planted on

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 ?



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32. 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 andErespectively,such that $\frac{AD}{AB} = \frac{AE}{AC} = \frac{1}{4}$. Calculate the area of the

$\triangle ADE$ and compare it with the area of $\triangle ABC$.

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33. 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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34. 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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35. 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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36. Let A (4, 2), B (6, 5) and C (1, 4) be the vertices of $\triangle ABC$. :- What do you observe ?

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37. 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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38. 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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39. Which of the following point lies on the X-axis :

A. (1,1)

B. (2,0)

C. (0,3)

D. (-4,-2)

Answer:

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40. The distance of a point from the Y-axis is called its ..... .

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41. Coordinates of point P on X axis are (..... , ...).

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42. Abscissa of point (3, - 4) is ..... .

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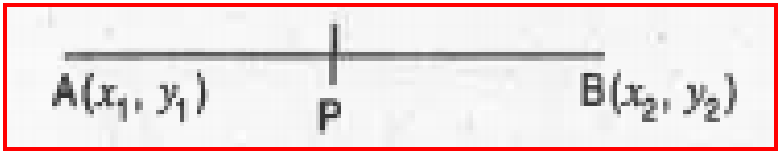
43. If a point P is the midpoint of the line segment joining the two points then write

coordinates of point P.



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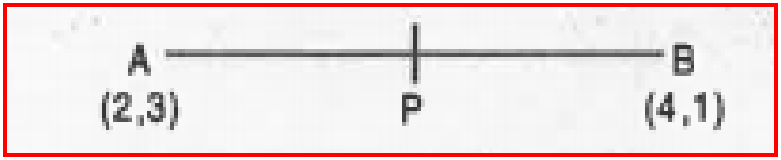
44. If A and B are two points and P is the midpoint of AB. Write coordinates of P.



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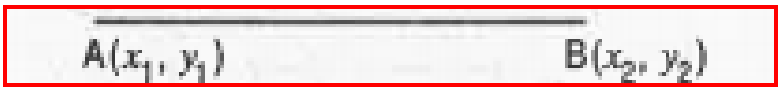
45. If A and B are the two points. Find the distance between them :



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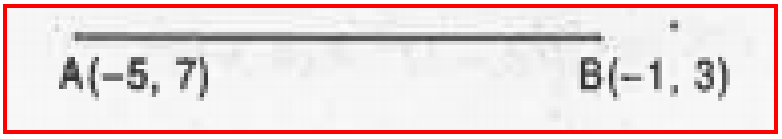
46. If A and B are the two points then find distance between them :



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47. If area of a triangle is 0 square units, its vertices will be..... .

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48. The distance of a point from X-axis is called its ..... .

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49. The point of intersection of axis is called ..... .

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50. The coordinates of origin is (0, 0).

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51. The point (x, 0) lies on x-axis.

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52. The point (5, 0) lies on y-axis.

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Exercise

1. 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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2. Check whether the points (20, 3) , (19, 8) and (2, - 9) are all equidistant from the point (7, 3).

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3. By use of distance formula, prove that each of the following sets of points are vertices of a right angled triangle. :- (- 4,-3), (- 2, 2) and (8,- 2).

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4. By use of distance formula, prove that each of the following sets of points are vertices of a right angled triangle. :- (- 2, 4), (3,- 1) and (6, 2).

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5. By use of distance formula, prove that each of the following sets of points are vertices of a right angled triangle. :- (4, 4), (3, 5) and (-1,-1).

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6. Show that the following sets of points are the vertices of right isosceles triangle. :- (0, 0), (5, 5) and (5,-5).

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7. Show that the following sets of points are the vertices of right isosceles triangle. :- (3,-1), (5,-1) and (3,-3).

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8. Show that the following sets of points are the vertices of right isosceles triangle. :- (0,- 4), $\left(\frac{3}{2}-2\right)$ and (3, 0) .

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9. Show that each of the triangles whose vertices are given below is isosceles :- (8, 2), (5,- 3), and (0, 0).

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10. Show that each of the triangles whose vertices are given below is isosceles :- (0, 6), (-5, 3) and (3, 1).

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11. Show that each of the triangles whose vertices are given below is isosceles :- (0, 5), (6, 3) and (5, 10).

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12. Show that the following sets of points are the vertices of an equilateral triangle :- (1, 1),(-1,-1) and $\left(-\sqrt{3}, \sqrt{3}\right)$.

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13. Show that the following sets of points are the vertices of an equilateral triangle :- (0,0), $\left(5, 5\sqrt{3}\right)$ and $\left(-5, 5\sqrt{3}\right)$.

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14. Show that the following sets of points are the vertices of an equilateral triangle :- (a,a) , (-a ,-a) and $\left(\sqrt{3}a, -\sqrt{3}a\right)$.

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15. Show that the following sets of points are the vertices of an equilateral triangle :- (3a,5a) , $\left(3a+\sqrt{3a}, 6a\right)$ and (3a,7a) .

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16. Show that the points :- A (2, 1), B (5, 4), C (4, 7) and D(1, 4)are the angular points of a paralleogram. ABCD.

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17. Show that the points :- P (3, 2), Q (0, - 1), R (- 3,- 2) and S (0, 1) are the vertices of parallelogram PQRS.

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18. Show that the points : A (0,- 2), B (3, 1), C (0, 4) and D (- 3, 1) are the vertices of a square ABCD.

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19. Show that the points : P (1, 2), Q (5, 4), R (3, 8) and S (-1, 6) are the angular points of a square PQRS.

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20. Show that the points : D (6, 2), E (2, 1), F (1, 5) and G (5, 6) are the vertices of a square DEFG.

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21. show that the poins :- P (4, 4), Q (2,-3), R (- 5,- 5) and S (- 3, 2) are the corners of a rhombus.

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22. Show that the points : A (7, 3), B (3, 0), C (0, -4) and D (4, - 1) are the vertices of rhombus ABCD.

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23. The vertices of a quadrilateral are points A (- 4, 3), B (0, 0), C (4, 0) and D (0, 3). Find the lengths of its sides and point out what type of quadrilateral is it ?

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24. Show that the point :- (4, 3), (2, 0) and (-4,-9) are collinear.

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25. Show that the point :- (4, 2), (7, 5) and (9, 7) are collinear.

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26. Find the value of x such that PQ = QR, where P, Q and R are (6,- 1), (1, 3) and (x, 8) respectively.

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27. Find the point on x-axis, which is equidistant from points (7, 6) and (9, 4).

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28. What points on y-axis is equidistant from the points (- 3, 4) and (7, 6).

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29. Find the points on y-axis which is equidistant from points (5, 2) and (- 4, 3).

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30. Find the points on x-axis which is equidistant from the points (7, 6) and (- 3, 4).

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31. If 'a' is the length of one of the sides of an equilateral triangle ABC, baseBC lies on x-axis and vertex B is at the origin, find the coordinates,of the vertices of the triangle ABC.

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32. Find the abscissae of points whose ordinate is 4 and which are at a distance of 5 units from (5, 0).

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33. Given A = (3, 0) and B = (0, b-2), Find b if AB = 5.

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34. Given A = (a + 2,- 1) and B = (11, 7). Find a if AB = 17.

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35. A point P is at a distance of $\sqrt{10}$ from the points (4,3).Find theco-ordinatesof point P, if its ordinate istwice of its abscissa.

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36. The distance between the points (3, 1) and (0, y) is 5. Find y.

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37. A point A (2,-1) is equidistant from the points (b,-7) and (- 3, b). Find b.

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38. Find the co-ordinates of points on x-axis which are at a distance of 17 units from the point (11,- 8).

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39. Find the co-ordinates of points on y-axis, which are at a distance of 10 units from the point (- 8, 4).

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40. Points A (-3,-2), B (-6, a\C (-3,-4) and D (0, - 1) are the vertices of quadrilateral ABCD , find a if a is negative and AB = CD.

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41. A point P lies on x-axis and another point Q lies on y-axis. :- Write the ordinate of point P.

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42. A point P lies on x-axis and another point Q lies on y-axis. :- Write the abscissa of point Q.

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43. A point P lies on x-axis and another point Q lies on y-axis. :- If the abscissa of point P is - 12 and the ordinate of point Q is-16, calculate the, length of line segment PQ.

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44. Using distance formula, check whether the following points are collinear or not. :- (1,2), (4,-1) and (2, -5).

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45. Using distance formula, check whether the following points are collinear or not. :- (- 4, 3), (0, 1), (2, 0) and (4,-1).

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46. Using distance formula, check whether the following points are collinear or not. :- (-3,2), (2, 1) and (1,4).

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47. Using distance formula, check whether the following points are collinear or not. :- (- 3, 3), (0,2), (3, 1) and (6,0).

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48. Using distance formula, check whether the following points are collinear or not. :- (-1,-1), (5, 7) and (8, 11).

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49. The points P (a, b) Q (- 3, - 1) and R (3, 4) are such that PQ = PR , express a in terms b.

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50. Find the co-ordinates of the point A which divides the line segment joining :- P (5,- 2) and Q (9, 6) in the ratio 3 : 1.

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51. Find the co-ordinates of the point A which divides the line segment joining :- P (- 7, 2) and Q (-1,-1) in the ratio 4 : 1.

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52. Find the ratio in which the line segment joining (2,-3) and (5, 6) is divided by xaxis, Also find the co-ordinates of point of intersection.

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53. Find the ratio in which line joining (- 4, 7) and (3, 0) is divided by y-axis. Also find the co-ordinates of the point of intersection.

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54. P is a point on the line joining A (4, 3) and B (- 2, 6) such that $\frac{AP}{BP} = \frac{2}{5}$. Find the co-ordinates of P.

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55. The line joining the points A (- 3,- 10) and B (- 2, 6) is divided by the point P such that 5 PB = AB. Find the co-ordinates of P.

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56. Find the ratio in which point C(3,3)divides the line joining A(7, 1) and B(1,4).

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57. Find the ratio in which (-6,a) divides the line segment joining the points (-3,1) and (-8,9). Also find the value of a.

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58. Find the co-ordinates of the points of trisection of the line segment joining the points (3,- 3) and (6, 9).

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59. Calculate the co-ordinates of points which divide the join of (3, 4) and (15, 20) into four equal parts.

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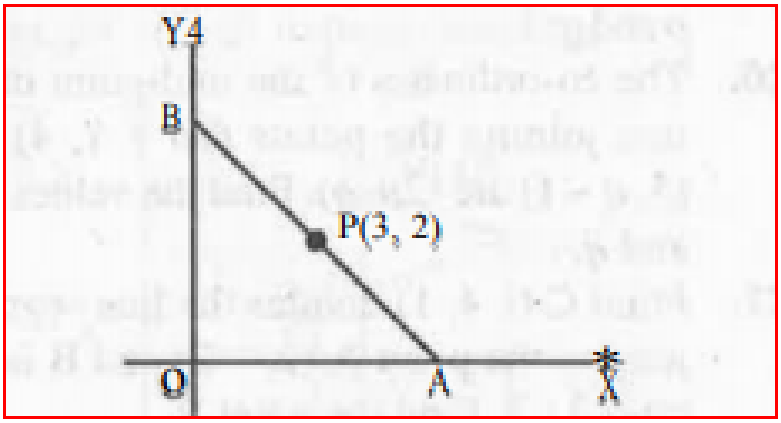
60. In the given figure, P (3, 2) is mid-point of line segment AB. Find the co-ordinates of A and B.



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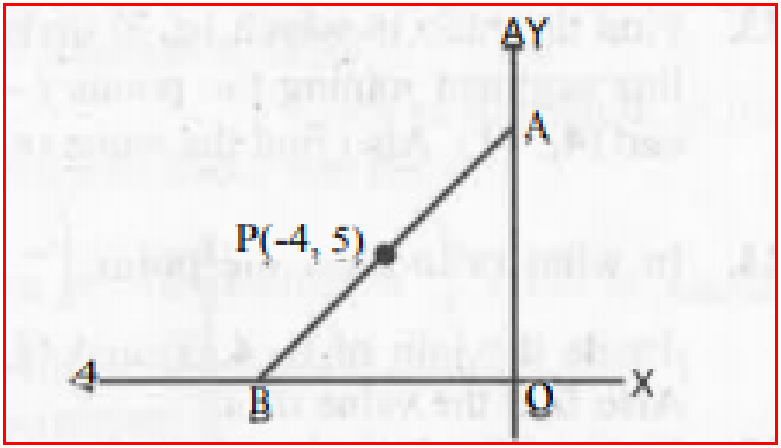
61. P (-4, 5) is the mid-point of line segment AB asshown in the following figure. Find the co-

ordinates of points A and B.



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62. (-5, 2) (3,-6) and (7, 4) are the vertices of a triangle. Find the lengths of all its medians.

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63. Points A (- 5, y), B (x, 7) and C (1,- 3) are collinear (i.e. lie on the same straight line) such that AB = BC. Calculate the values of x and y.

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64. Find the point of intersection of the medians of the triangle with vertices at (- 1, 0), (5,- 2) and (8, 2).

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