



## MATHS

### BOOKS - NAGEEN MATHS (HINGLISH)

#### CO-ORDINATE GEOMETRY

##### Solved Examples

1. Find the distance between the following points :

(i) (3, 4) and (5, 2)

(ii) (0, 2) and (4, -1)

(iii) (a, 2a) and (-a, -2a)

(iv) (4, -3) and (-6, 5)



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2. Find the distance between the points  $(5, 8)$  and  $(-3, 2)$ .

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3. Find the distance between the points  $(2, 6)$  and  $(0, 9)$ .

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4. Find the distance between the points  $(a \cos \theta, a \sin \theta)$  from the origin.

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5. Find the distance of the point  $(3, 4)$  from the origin.

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6. If the distance between the points  $(x, 2)$  and  $(6, 5)$  is 5 units, find the value of ' $x$ '.



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7. If the distance between the points  $(-2, -5)$  and  $(-6, y)$  is 5 units, find the value of  $y$ .



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8. If the distances of  $P(x, y)$  from  $A(5, 1)$  and  $B(-1, 5)$  are equal, then,

A.  $2x = 3y$

B.  $2x = 5y$

C.  $3x = 2y$

D.  $5x = 2y$

**Answer: C**

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**9.** Prove that the points  $(5, -2)$ ,  $(-4, 3)$  and  $(10, 7)$  are the vertices of an isosceles right-angled triangle.

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**10.** Prove that the points  $(a, a)$ ,  $(-a, -a)$  and  $(-a\sqrt{3}, a\sqrt{3})$  are the vertices of an equilateral triangle.

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11. Prove that the points  $(4, 8)$ ,  $(7, 5)$ ,  $(1, -1)$  and  $(-2, 2)$  are the vertices of a parallelogram.

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12. Prove that the points  $(2, -1)$ ,  $(4, 1)$ ,  $(2, 3)$  and  $(0, 1)$  are the vertices of a square.

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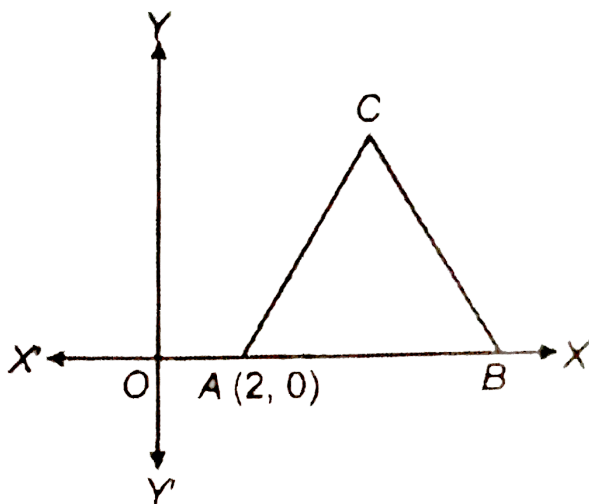
13. Show that the points  $A(-3, 3)$ ,  $B(7, -2)$  and  $C(1, 1)$  are collinear.

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14. Show that the points  $(9, -2)$ ,  $(-5, 12)$  and  $(-7, 10)$  lie on that circle whose centre is the point  $(1, 4)$

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15. In the given figure,  $\triangle ABC$  is an equilateral triangle of side 3 units. Find the coordinates of the other two vertices.



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**16.** A cyclic quadrilateral is drawn such that three of its consecutive vertices are  $(0, 4)$ ,  $(0, 0)$  and  $(2, 0)$ . Find the longest distance between any two vertices of this quadrilateral.

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**17.** The co-ordinates of two vertices of an equilateral triangle are  $(0, 0)$  and  $(3, \sqrt{3})$ . Find the co-ordinates of the third vertex of the triangle.

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**18.** What point on the X-axis is equidistant from  $(7, 6)$  and  $(-3, 4)$  ?

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19. Find the equation of the set of all points equidistant from the point  $(4, 2)$  and the X-axis.

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20. Find the equation of the set of points such that the sum of its distances from  $(0, 3)$  and  $(0, -3)$  is 8.

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21. Find the equation of the set of all points which are twice as far from  $(3, 2)$  as from  $(1, 1)$ .

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22.

If

$A(2, 2)$ ,  $B(-2, -2)$ ,  $C(-2\sqrt{3}, 2\sqrt{3})$  and  $D(-4 - 2\sqrt{3}, 4 + 2\sqrt{3})$

are the co-ordinates of 4 points. What can be said about these four points ?



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23. Find the coordinates of points on the line joining the point that is twice as far from as from



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24. Show that  $\triangle ABC$ , where

$A(-2, 0)$ ,  $B(2, 0)$ ,  $C(0, 2)$  and  $\triangle PQR$  where

$P(-4, 0)$ ,  $Q(4, 0)$  and  $R(0, 4)$  are similar triangles.



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25. Find the co-ordinates of a point which divides the line segment joining the points (5, 1) and (-10, 11) in the ratio 2 : 3 internally.

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26. If a point  $P$  lies on the line segment joining points  $A(-3, 4)$  and  $B(-2, -6)$  such that  $2AP = 3BP$  then, find the co-ordinates of point  $P$ .

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27. Find the co-ordinates of a point which divides the line joining the points  $A(3, 4)$  and  $B(-2, -1)$  in the ratio 3 : 2 externally.

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28. Find the co-ordinates of a point which divides the line joining the points  $A(5, -2)$  and  $B(4, 6)$  in the ratio  $1 : 2$  externally.

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29. Find the co-ordinates of the mid-point of the line segment joining the points  $A(3, -5)$  and  $B(1, 1)$ .

A.  $(2, 2)$

B.  $(4, -4)$

C.  $(1, -1)$

D.  $(2, -2)$

**Answer: D**

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**30.** The co-ordinates of the end points of a diameter are  $(-1, 5)$  and  $(3, -1)$ . Find the co-ordinates of the centre and the radius of circle.

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**31.** The co-ordinates of the mid-point of line joining the points A and B are  $(2, -3)$ . If the co-ordinates of point A are  $(-3, 4)$ , then find the co-ordinates of point B.

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**32.** Find the ratio in which X-axis divides the line segment joining the points  $(8, 5)$  and  $(-3, -7)$ .

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**33.** In what ratio does the point  $\left(\frac{24}{11}, y\right)$  divide the line segment joining the points  $P(2, -2)$  and  $Q(3, 7)$ ? Also find the value of  $y$ .

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**34.** The co-ordinates of the vertices of  $\triangle ABC$  are  $A(3, 2)$ ,  $B(1, 4)$  and  $C(-1, 0)$ . Find the length of median drawn from point A.

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**35.** Find the co-ordinates of the points of trisection of the line joining the points  $(3, -2)$  and  $(-3, -4)$ .

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**36.** If two adjacent vertices of a parallelogram are  $(3, 2)$  and  $(-1, 0)$  and the diagonals intersect at  $(2, -5)$ , then find the coordinates of the other two vertices.

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**37.** The co-ordinates of three consecutive vertices of a parallelogram are  $(-1,0)$ ,  $(3, 1)$  and  $(2, 2)$ . Find the co-ordinates of fourth vertex of the parallelogram.

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**38.** Find the image of point  $P(3,-1)$  in the point  $A (-5, 2)$ .

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39. In what ratio does the line  $x - y - 2 = 0$  divide the line segment joining  $(3, -1)$  and  $(8, 9)$  ?

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40. Find a point on the line through  $A(5, -4)$  and  $B(-3, 2)$ , that is, twice as far from A as from B.

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41. Find the centroid of the triangle whose vertices are  $A(-1, 0)$ ,  $B(5, -2)$  and  $C(8, 2)$ .

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**42.** A line intersect the Y-axis and X-axis at the points P and Q respectively. If  $(2,-5)$  is the mid-point of PQ, then find the coordinate of P and Q.



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**43.** Point P  $(h,k)$  divides a line segment between the axes in the ratio  $1:2$ . Find the lengths (intercepts) on the axes made by this segment. Also find the area of triangle formed by the line segment and the axes.



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**44.** Find the area of the triangle, whose vertices are  $(2,1)$ ,  $(4,5)$  and  $(6,3)$ .

A. 3



B. 6

C. 9

D. 12

**Answer: B**



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**45.** Find the area of triangle, whose vertices are  $(2,3)$ ,  $(7,5)$  and  $(-7,-5)$ .



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**46.** Find the area of the triangle, whose vertices are  $(a,c+a)$ ,  $(a,c)$  and  $(-a,c-a)$ .



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47. Prove that the points (6,4) (4,5) and (2,6) are collinear.

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48. If the points A (x,y), B (1,4) and C (-2,5) are collinear, then shown that  $x + 3y = 13$ .

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49. For what value of 'k', the points (k,1), (1,-1) and (11,4) are collinear ?

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50. If  $a \neq b \neq 0$ , prove that the points  $(a, a^2)$ ,  $(b, b^2)$ ,  $(0, 0)$  will not be collinear.

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51. If  $(x,y)$  be any point on the line segment joining the points  $(a,0)$  and  $(0,b)$  then prove that  $\frac{x}{a} + \frac{y}{b} = 1$ .

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52. If  $P$  be a point equidistant from points  $A(3,4)$  and  $B(5,-2)$  and area of  $\triangle PAB$  is 10 square units, then find the co-ordinates of point  $P$ .

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53. The area of a triangle is 5 sq. units. Two of its vertices are  $(2,1)$  and  $(3,-2)$ . If the third vertex is  $\left(\frac{7}{2}, y\right)$ , find the value of  $y$ .

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1. If the point  $P(k-1, 2)$  is equidistant from the points  $A(3, k)$  and  $B(k, 5)$ , find the values of  $k$ .

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2. Find a point on  $y$ -axis which is equidistant from the points  $(5, -2)$  and  $(-3, 2)$ .

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3. Points  $A(-1, y)$  and  $B(5, 7)$  lie on a circle with centre  $O(2, -3y)$ . Find the values of  $y$ . Hence, find the radius of the circle.

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4. The points  $A(4, 7)$ ,  $B(p, 3)$  and  $C(7, 3)$  are the vertices of a right triangle, right-angled at  $B$ . Find the value of  $p$ .

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5. Find the co-ordinates of the points of trisection of the line segment joining the points  $A(-5, 6)$  and  $B(4, -3)$ .

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6. Find the ratio in which the point  $P(x, 2)$  divides the line segment joining the points  $A(12, 5)$  and  $B(4, -3)$ . Also find the value of  $x$ .

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7. Find the lengths of the medians AD and BE of  $\triangle ABC$  whose vertices are  $A(7, -3)$ ,  $B(5, 3)$  and  $C(3, 1)$

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8. If the points  $A(-1, -4)$ ,  $B(b, c)$  and  $C(5, -1)$  are collinear and  $3b + c = 4$ , find the values of b and c.

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## Problems Of Ncert Exemplar

1. Find the points on the X-axis which are at distance of  $2\sqrt{5}$  from the point  $(7, -4)$ . How many such points are there ?

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2. Find a point which is equidistant from the points  $A(-5, 4)$  and  $B(-1, 6)$  How many such points are there ?

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3. Find the value of  $m$ , if the points  $(5,1)$ ,  $(-2,-3)$  and  $(8,2m)$  are collinear

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4. If point  $P(9a - 2, b)$  divides the line segment joining the points  $A(3a + 1, -3)$  and  $B(8a, 5)$  in the ratio  $3 : 1$ , then find the values of  $a$  and  $b$ .

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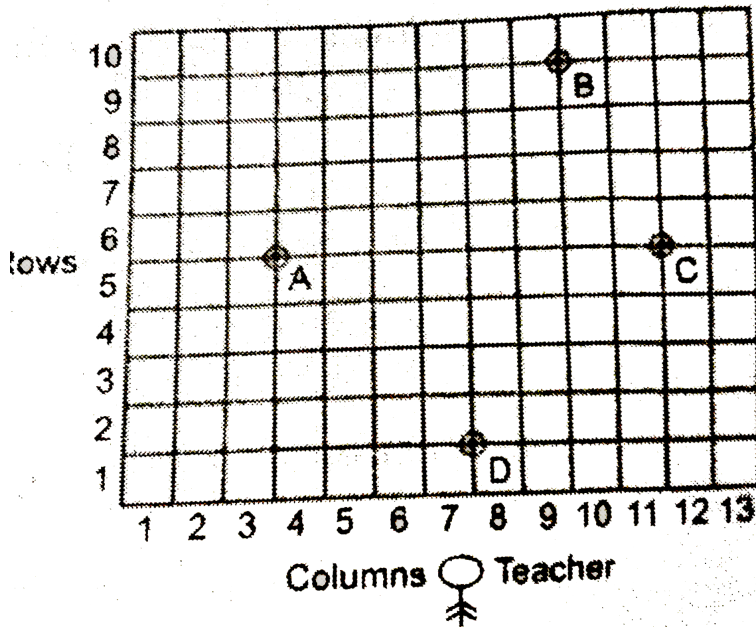
5.  $A(6, 1)$ ,  $B(8, 2)$  and  $C(9, 4)$  are three vertices of parallelogram ABCD. If E is the mid-point of DC, then find the area of  $\triangle ADE$ .

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6. Student of a school are standing in rows and columns in their playground for a drill practice. A, B, C, D are the positions of four students as shown in the figure. Is it possible to place Jaspal in the drill in such a way that he is equidistant from each of the four



students A, B, C and D? If so, what should be his position ?



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7. Ayush starts walking from his house to office. Instead of going to the office directly, he goes to a bank first, from there to his daughter's school and then reaches the office. What is the extra distance travelled by Ayush in reaching his office ? (Assume that all distance covered are in straight lines). If the house is situated at  $(2, 4)$ , bank at

(2, 4), bank at (5, 8) school at (13, 14) and office at (13, 26) and coordinates are in km.

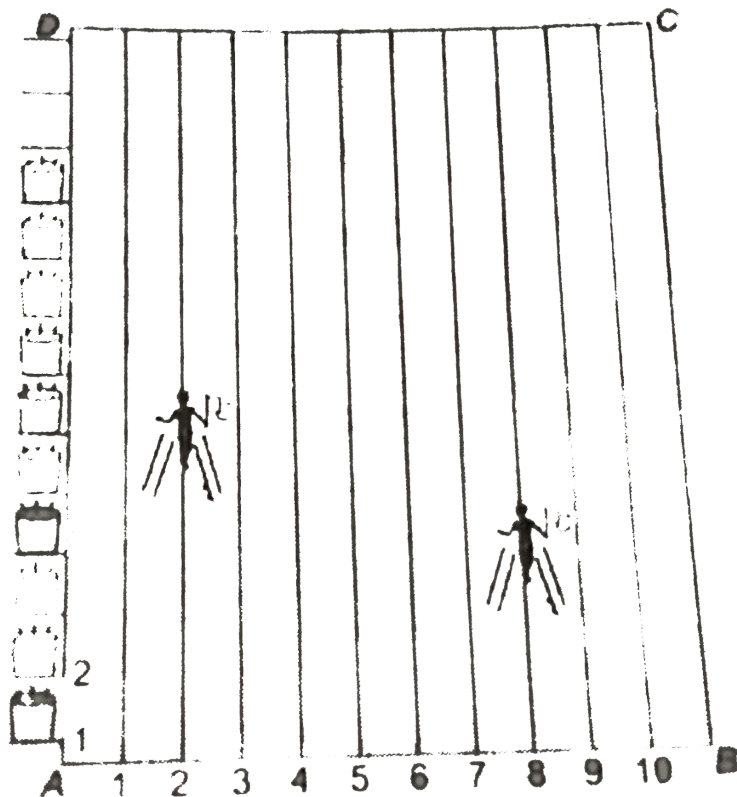


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**8.** To conduct Sports Day activities, in your rectangular shaped school ground ABCD, lines have been drawn with chalk powder at a distance of 1 m each. 100 flower pots have been placed at a distance of 1 m from each other along AD, as shown in figure.

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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9. 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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**10.** Find the co-ordinates of the points which divide the line segment joining A (-2, 2) and B(2, 8) into four equal parts.

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

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

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14.  $ABCD$  is a rectangle formed by joining the points  $A(-1, -1)$ ,  $B(-1, 4)$ ,  $C(5, 4)$  and  $D(5, -1)$ .  $P$ ,  $Q$ ,  $R$  and  $S$  are the mid-points of sides  $AB$ ,  $BC$ ,  $CD$  and  $DA$  respectively. Is the quadrilateral  $PQRS$  a square? a rectangle? or a rhombus? Justify your answer.

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### Exercise 7 A

1. Find the distance between the following points : (i)  $A(-6, 4)$  and  $B(2, -2)$  (ii)  $A(-5, -1)$  and  $B(0, 4)$



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2. Find the distance of the following points from origin :

(i) (3, -4)

(ii) (-8, -6)

(iii) (5, 12)

(iv) (7, 24)



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3. Find the distance between the points (a, b) and (-b, a).



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4. Find the distance between the points (2a, 3a) and (6a, 6a).



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5. Find the distance between origin and the point  $(a, -b)$ .

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6. If the distance between the points  $(6, 0)$  and  $(0, y)$  is 10 units, find the value of  $y$ .

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7. If the distance between the points  $(3, x)$  and  $(-2, -6)$  is 13 units, then find the value of  $x$ .

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8. Prove that the distance between the origin and the point  $(-6, -8)$  is twice the distance between the points  $(4, 0)$  and  $(0, 3)$ .



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9. Find the co-ordinates of a point whose abscissa is 10 and its distance from the point (2, -3) is 10 units.



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10. Prove that the following points are the vertices of a right-angled triangle :

(i)  $A(-2, 2)$ ,  $B(13, 11)$  and  $C(10, 14)$

(ii)  $A(-1, -6)$ ,  $B(-9, -10)$  and  $C(-7, 6)$



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11. Prove that the following points are the vertices of an isosceles right-angled triangle :



(i)  $A(-8, -9)$ ,  $B(0, -3)$  and  $C(-6, 5)$

(ii)  $A(1, -1)$ ,  $B(-2, 2)$  and  $C(-2, -1)$

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**12.** Prove that the points  $(-1, -2)$ ,  $(-2, -5)$ ,  $(-4, -6)$  and  $(-3, -3)$  are the vertices of a parallelogram.

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**13.** Prove that the points  $(-4, -3)$ ,  $(-3, 2)$ ,  $(2, 3)$  and  $(1, -2)$  are the vertices of a rhombus.

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**14.** Show that the following points are the vertices of a rectangle :

(i)  $A(4, 2)$ ,  $B(0, -4)$ ,  $C(-3, -2)$ ,  $D(1, 4)$

(ii)  $A(1, -1)$ ,  $B(-2, 2)$ ,  $C(4, 8)$ ,  $D(7, 5)$

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**15.** Show that the points  $A(2, 1)$ ,  $B(0, 3)$ ,  $C(-2, 1)$  and  $D(0, -1)$  are the vertices of a square.

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**16.** Show that the points  $(1, 1)$ ,  $(2, 3)$  and  $(5, 9)$  are collinear.

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**17.** Show that the points  $(0, 0)$ ,  $(5, 3)$  and  $(10, 6)$  are collinear.



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18. Show that the points  $(-3, 2)$ ,  $(2, -3)$  and  $(1, 2\sqrt{3})$  lie on the circumference of that circle, whose centre is origin.

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19. If the point  $(x, y)$  is equidistant from the points  $(a+b, b-a)$  and  $(a-b, a+b)$ , then prove that  $bx=ay$ .

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20. If  $(1, 1)$  and  $(1, 8)$  are the opposite vertices of a square, then find the co-ordinates of remaining two vertices.

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## Exercise 7 B

1. Find the co-ordinates of a point which divides the line joining the points  $(5, 3)$  and  $(10, 8)$  in the ratio  $2 : 3$  internally.

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2. Find the co-ordinates of a point which divides the line joining the points  $(-1, 2)$  and  $(3, 5)$  in the ratio  $3 : 5$  internally.

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3. Find the co-ordinates of a point which divides the line joining the points  $(2, -1)$  and  $(3, 3)$  in the ratio  $2 : 1$  internally.

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4. Find the co-ordinates of a point which divides the line segment joining the points  $(1, -3)$  and  $(2, -2)$  in the ratio  $3 : 2$  externally.



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5. Find the co-ordinates of a point which divides the line segment joining the points  $(3, 0)$  and  $(0, 2)$  in the ratio  $2 : 1$  externally.

A.  $(3, 4)$

B.  $(-3, 4)$

C.  $(3, -4)$

D.  $(-3, -4)$



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6. If a point A lies on the line segment joining the points  $P(6, 0)$  and  $Q(0, 8)$  such that  $AP : AQ = 2 : 3$ , find the co-ordinates of point A.



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7. Find the ratio in which X-axis divides the line segment joining the points  $(8, 5)$  and  $(-3, 7)$ .



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8. Find the ratio in which Y-axis divides the line segment joining the points  $(3, 4)$  and  $(-2, 5)$ .



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9. Find the ratio in which Y-axis divides the line segment joining the points  $(a, b)$  and  $(-b, a)$ .



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10. Find the co-ordinates of the mid-point of the line joining the following points :

(i) (2, 4) and (6, 2)

(ii) (0, 2) and (2, -4)

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

(iv) (3, -5) and (-1, 3)

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11. The co-ordinates of the end points of a diameter of a circle are (3, -2) and (-3, 6). Find the co-ordinates of the centre and radius.

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12. The co-ordinates of the vertices of a  $\triangle ABC$  are  $A(1, 0)$ ,  $B(3, 6)$  and  $C(3, 2)$ . Find the length of its medians.

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**13.** The co-ordinates of three consecutive vertices of a parallelogram are  $(2, 0)$ ,  $(4, 1)$  and  $(6, 4)$ . Find the co-ordinates of its 4th vertex.

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**14.** Find the co-ordinates of the points of trisection of the line segment joining the points  $(2, 5)$  and  $(6, -2)$ .

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**15.** Find the co-ordinates of the points of trisection of the line segment joining the points  $(-2, 0)$  and  $(4, 0)$ .

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**16.** Find the ratio in which the join of points  $(3, -1)$  and  $(8, 9)$  is divided by the line  $y-x+2=0$ .

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**17.** The line segment joining the points  $(3, -4)$  and  $(1, 2)$  is trisected at the points  $P$  and  $Q$ . If the co-ordinates of  $P$  and  $Q$  are  $(p, -2)$  and  $\left(\frac{5}{3}, q\right)$  respectively, find the values of  $p$  and  $q$ .

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**18.** Two circles  $C(O, r)$  and  $C'(O', r')$  touch externally at  $P(3, 1)$ . If the co-ordinates of  $O$  and  $O'$  are  $(1, p)$  and  $(q, -2)$  respectively. Their areas are in the ratio  $4 : 9$ . Find the value of  $p^2 + q^2$ .

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## Exercise 7 C

1. Find the area of that triangle whose vertices are  $(2, 3)$ ,  $(-3, 4)$  and  $(7, 5)$ .

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2. Find the area of that triangle whose vertices are  $(1, 1)$ ,  $(-1, 4)$  and  $(3, 2)$ .

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3. Find the area of that triangle whose vertices are  $(-4, 3)$ ,  $(-2, 1)$  and  $(5, 2)$ .

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4. Find the area of that triangle whose vertices are  $(at_1^2, 2at_1)$ ,  $(at_2^2, 2at_2)$  and  $(at_3^2, 2at_3)$ .

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5. Find the area of that triangle whose vertices are  $(b + c, a)$ ,  $(b - c, a)$  and  $(a, -a)$ .

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6. Prove that the following points are collinear :

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

(ii)  $(9,6)$ ,  $(-1,4)$  and  $(2,5)$

(iii)  $(b + c, a)$ ,  $(c + a, b)$  and  $(a + b, c)$

(iv)  $(5,6)$ ,  $(-1,4)$  and  $(2,5)$

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7. (i) If the points  $(1, 4)$ ,  $(3, -2)$  and  $(k, 1)$ ,  $B(3k, 2k + 3)$  and  $C(5k - 1, 5k)$  are collinear, find the value of  $k$ .

(ii) If the points  $A(k + 1, 2k)$ ,  $B(3k, 2k + 3)$ ,  $B(3k, 2k + 3)$  and  $C(5k - 1, 5k)$  are collinear, then show that  $x + y = 2$ .

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8. If the points  $A(x, y)$ ,  $(-1, 3)$  and  $(5, -3)$  are collinear, then show that  $x + y = 2$ .

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9. 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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10. Find the area of the quadrilateral whose vertices are  $(-4, -2)$ ,  $(-3, -5)$ ,  $(3, -2)$ ,  $(2, 3)$

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11.  $A(4, 3)$ ,  $B(6, 5)$  and  $C(5, -2)$  are the vertices of a  $\Delta ABC$ , if P is a point on BC such that  $BP:PC = 2:3$ . Find the co-ordinates of P and then prove that  $ar(\Delta ABP):ar(\Delta ACP) = 2:3$ .

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12. The vertices of a  $\triangle ABC$  are  $A(4, 6)$ ,  $B(1, 5)$  and  $C(7, 2)$ . A line is drawn to intersect side  $AB$  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  $\triangle ABC$ .

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13. The area of a triangle is 5 units. Two of its vertices are  $(2, 1)$  and  $(3, -2)$ . The third vertex lies on  $y = x + 3$ . Find the coordinates of the third vertex of the triangle.

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14. The perpendicular bisector of the line segment joining the points  $A(1, 5)$  and  $B(4, 6)$  cuts the  $y$ -axis at which point?

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## Exercise 7 D

1. Find the values of  $y$  of which the distance between the points  $A(3, -1)$  and  $B(11, y)$  is 10 units.



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2. Find the relation between  $x$  and  $y$  such that the point  $P(x, y)$  is equidistant from the points  $A(1, 4)$  and  $B(-1, 2)$ .



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3. Find the point on Y-axis which is equidistant from the points  $(-5, 2)$  and  $(9, -2)$ .



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4. Find the co-ordinates of the point equidistant from three given points  $A(5, 1)$ ,  $B(-3, -7)$  and  $C(7, -1)$ .

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5. Show that the points  $(a, a)$ ,  $(-a, -a)$  and  $(-\sqrt{3}a, \sqrt{3}a)$  are the vertices of an equilateral triangle. Find its area.

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6. Show that the points  $(1, 1)$ ,  $(-1, 5)$ ,  $(7, 9)$  and  $(9, 5)$  taken in that order, are the vertices of a rectangle.

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7. Show that the points  $A(3, 5)$ ,  $B(6, 0)$ ,  $C(1, -3)$  and  $D(-2, 2)$  are the vertices of a square ABCD.

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8. If  $A(2, -1)$ ,  $B(3, 4)$ ,  $C(-2, 3)$  and  $D(-3, -2)$  be four points in a plane show that ABCD is a rhombus but not a square. Find the area of the rhombus.

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9. Find the co-ordinates of a point P on the line segment joining  $A(1, 2)$  and  $B(6, 7)$  such that  $AP = \frac{2}{5}AB$ .

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10. Point P divides the line segment joining the points  $A(2, 1)$  and  $B(5, -8)$  such that  $\frac{AP}{AB} = \frac{1}{3}$ . If P lies on the line  $2x - y + k = 0$ , find the value of k.

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11. Find the ratio in which the point P (11,y) divides the line segment joining the points  $A(15, 5)$  and  $B(9, 20)$ . Also find the value of y.

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12. Two vertices of a  $\Delta ABC$  are given by  $A(6, 4)$  and  $B(-2, 2)$  and its centroid is G (3,4). Find the co-ordinates of the vertex C of  $\Delta ABC$ .

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13. The base  $QR$  of an equilateral triangle  $PQR$  lies on  $X$ -axis. The co-ordinates of the point  $Q$  are  $(-4,0)$  and origin is the mid-point of the base. Find the co-ordinates of the points  $P$  and  $R$ .

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14. The mid-point  $P$  of the line segment joining the points  $A(-10, 4)$  and  $B(-22, 0)$  lies on the line segment joining the points  $C(-9, -4)$  and  $D(-4, y)$ . Find the ratio in which  $P$  divides  $CD$ . Also, find the value of  $y$ .

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15. Find the value of  $k$  so that the area of the triangle with vertices  $(1, -1)$ ,  $(-4, 2k)$  and  $(-k, -5)$  is 24 square units.

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16. If  $A(4, -6)$ ,  $B(3, -2)$  and  $C(5, 2)$  are the vertices of a  $\triangle ABC$  and  $AD$  is its median, prove that the median  $AD$  divides  $\triangle ABC$  into two triangles of equal areas.

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17. Find the area of quadrilateral  $ABCD$ , whose vertices are  $A(-4, 8)$ ,  $B(-3, -4)$ ,  $C(0, -5)$  and  $D(5, 6)$ .

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18. If the area of  $\triangle ABC$  with vertices  $A(x, y)$ ,  $B(1, 2)$  and  $C(2, 1)$  is 6 square units, then prove that  $x + y = 15$  or  $x + y + 9 = 0$ .

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1. Find the value of  $a$  so that the point  $(3, a)$  lies on the line represented by  $2x - 3y = 5$

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2. Find the value of  $k$  so that the point  $(2, 5)$  lies on the line represented by  $kx + 3y = 1$ .

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3. Find the distance of the point  $(4, -3)$  from the origin .

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4. Find the distance between the points  $(0, -3)$  and  $(3, 0)$

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5. In what ratio does the Y-axis divide the join of  $(-4, 2)$  and  $(8, 3)$ ?

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6. If the distance between the point  $(x, -1)$  and  $(-2, 2)$  is 5, then find the possible values of  $x$ .

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7. Find the centroid of  $\triangle ABC$  whose vertices are  $A(0, -1)$ ,  $B(-2, 5)$  and  $C(2, 8)$ .

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8. Two vertices of  $\triangle ABC$  are  $A(-1, 4)$  and  $B(5, 2)$  and its centroid is  $(0, -3)$ . Find the co-ordinates of point  $C$ .



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9. Three vertices of a parallelogram ABCD are B (6,7) , C (8,3) and D (0, - 1) . Find the co-ordinates of vertex A .



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10. Find the value of k if the points (2,3) , (5,k) and (6,7) are collinear .



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### Revision Exercise Short Answer Questions

1. If  $A(-2, 4)$ ,  $B(0, 0)$  and  $C(4,2)$  are the vertices of  $\triangle ABC$  , find the length of the median through A .



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2. Find the relation between  $x$  and  $y$  if the points  $A(x, y)$ ,  $B(-5, 7)$  and  $C(-4, 5)$  are collinear.

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3. In what ratio does the line  $x - y - 2 = 0$  divide the line segment joining the points  $(3, -1)$  and  $(8, 9)$ ?

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4. Find the area of the triangle whose vertices are  $(3, 8)$ ,  $(-4, 2)$  and  $(5, -1)$ .

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5. Show that the points  $A(-1, -4)$  ,  $B(3,3)$  ,  $C(3,4)$  and  $D(-1, -3)$  are the vertices of a rhombus.

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6. If  $D(3,-2)$  ,  $E(-3,1)$  and  $F(4,-3)$  are the mid-points of the sides  $BC$ ,  $CA$  and  $AB$  respectively of  $\triangle ABC$  , find the co-ordinates of point  $A$  ,  $B$  and  $C$  .

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7. If the point  $P(-1, 2)$  divides the line segment joining  $A(2,5)$  and  $B$  in the ratio  $3:4$  , find the co-ordinate of  $B$  .

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8. Prove that the points  $(a, 0)$ ,  $(0, b)$  and  $(1, 1)$  are collinear if,

$$\frac{1}{a} + \frac{1}{b} = 1.$$

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9. If  $A(1,2)$ ,  $B(-2, 3)$  and  $C(-3,-4)$  be the vertices of  $\triangle ABC$ . Verify that median  $BE$  divides it into two triangles of equal areas.

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