



MATHS

BOOKS - R G PUBLICATION

CO-ORDINATE GEOMETRY

Example

1. If possible, find the length of the line segments joining the following pairs of points without using the distance

formula. $A(1,4)$ and $B(6,4), B(-2,-3)$ and $C(6,-3)$
 $D(2,3)$ and $E(2,-7)$.



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2. Arrange the following points in the ascending order of their distance from the origin: $A(2,3), B(-2,2), C(\sqrt{2}, 2), D(\sqrt{2}, \sqrt{3})$, $E(-1,-1)$ and $F(\sqrt{2}, -\sqrt{2})$



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3. If the distance of the point $(k, \sqrt{2})$ from the origin is $\sqrt{3}$ units. Find the value of k .



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4. Two lines parallel to the y -axis and at a distance of 2 units from the x -axis are taken. Another two lines parallel to the x -axis and at a distance of 3 units from the y -axis are also taken. Find the distance of the angular points

of the rectangle, formed by the four intersecting line segments, from the origin.



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5. Find the distance between the following pairs of points.[By using distance formula]:

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



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6. Find the distance between the following pairs of points.[By using distance formula]:

(ii)C(-5,7),D(-1,-3)



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7. Find the distance between the following pairs of points.[By using distance formula]:(iii)

E(a,2b),F(-3a,-2b)



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



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9. On what condition, will the point (x,y) be equidistant from the two points $(7,1)$ and $(3,5)$?



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10. If a point (x,y) is equidistant from the two points $(3,6)$ and $(-3,4)$, then find the relation between x and y .



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11. If the point $P(x,y)$ is equidistant from the two points $A(a,b)$ and $B(b,a)$, then show that $x=y$.



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12. Show that the triangle formed by the three points $(5,-2)$, $(6,4)$ and $(7,-2)$ is isosceles.



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13. Find the coordinates of the points on the y -axis which is equidistant from the two points $(4,-10)$ and $(-4,18)$.



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14. Find the areas of the triangle formed by the points whose coordinates are given below:

(i) $(5,-2), (6,4), (7,-2)$



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15. Find the areas of the triangle formed by the points whose coordinates are given below:

(ii) $(1,2), (2,-3), (-3,-4)$



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16. Find the areas of the triangle formed by the points whose coordinates are given below:

(iii) $(a, a+1), (-a, a-1), (0, -a)$



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17. Find the areas of the quadrilaterals formed by the following points: (i) $(6,1), (5,6), (2,4), (4,1)$



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18. Find the areas of the quadrilaterals formed by the following points:(ii)(1,2),(-1,3),(-2,-3),(4,-2)



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19. Find the area of the triangle formed by the three points A(3,4), B(-4,3) and C(8,-6). With the help of this, Find the length of the perpendicular drawn from A to BC.



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20. Find the coordinates of the points which divide the line segment joining the following pairs of points internally in the ratios given alongside.(i) $(-8,-5),(7,10)$ (ratio 3:1)



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21. Find the coordinates of the points which divide the line segment joining the following pairs of points internally in the ratios given alongside.(ii) $(-4,3),(2,-7)$ (ratio 2:3)



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22. Find the coordinates of the points which divide the line segment joining the following pairs of points internally in the ratios given alongside. (iii) $(6,0), (0,3)$ (ratio 1:2)



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23. Find the coordinates of the points which divide the line segment joining the following

pairs of points internally in the ratios given alongside. (iv) $(-4,7), (-2,-5)$ (ratio 1:4)



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24. Find the coordinates of the mid-points of the line segments which join the following pairs of points: (i) $(2a,0), (0,2a)$



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25. Find the coordinates of the mid-points of the line segments which join the following pairs of points:(ii) $(a,2a),(-2a,-a)$



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26. Find the coordinates of the mid-points of the line segments which join the following pairs of points:(iii) $(a+2b,2a-b),(a,b)$



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27. Find the coordinates of the mid-points of the line segments which join the following pairs of points:(iv)

$$\left((a + b), (a + b)^2 \right), \left((a - b), (a - b)^2 \right)$$



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28. Find the coordinates of the centroids of the triangles formed by the following points:

(i) $(a, 2a), (2a, 3a), (3a, a)$



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29. Find the coordinates of the centroids of the triangles formed by the following points:

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



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30. Find the coordinates of the centroids of the triangles formed by the following points:

(iii)(4,4),(-1,0),(0,-1)



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31. Find the coordinates of the centroids of the triangles formed by the following points:

(iv) $(a+b-c, a-2b), (b+c-a, b-2c), (c+a-b, c-2a)$



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32. A line segment AB is internally divided by the point $P(1,1)$ in the ratio 3:1. If the coordinates of A are $(-5,4)$, then find the coordinates of B.



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33. Find the ratio in which the point of intersection of the x-axis and the line segment which joins the points $(3,5)$ and $(2,-7)$ internally divides the line segment. Also find the coordinates of the point.



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34. Two vertices of a triangle are $(1,3)$ and $(3,1)$, If the coordinates of the centroid of the

triangle is $(2,1)$, find the coordinates of the third vertex of the triangle.



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35. If $A(5,-1)$, $B(-1,7)$ and $C(1,2)$ are the vertices of a triangle find the equation of the internal bisector of $\angle A$



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36.

If

$(\alpha_1, \beta_1), (\alpha_2, \beta_2), (\alpha_3, \beta_3)$ and (α_4, β_4) are the vertices of a parallelogram, show that $\alpha_1 + \alpha_3 = \alpha_2 + \alpha_4$ and $\beta_1 + \beta_3 = \beta_2 + \beta_4$.



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Exercise

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



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



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



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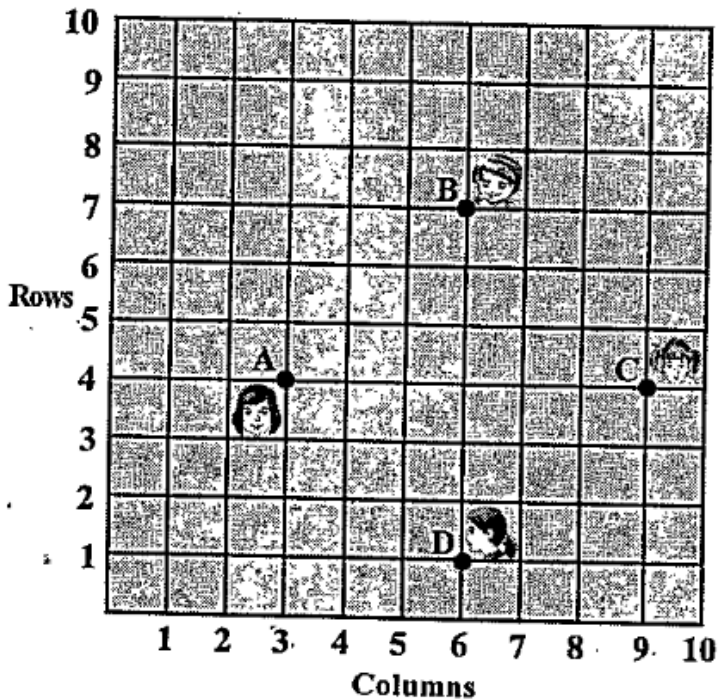
6. Check whether $(5,-2)$, $(6,4)$ and $(7,-2)$ are the vertices of an isosceles triangle.



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7. In a classroom, 4 friends are seated at the points A, B, C and D as shown in Fig. 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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8. Name the type of quadrilateral formed, if any, by the following points, and give reasons

for your answer:(i) $(-1,-2),(1,0),(-1,2),(-3,0)$



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9. Name the type of quadrilateral formed,if any,by the following points,and give reasons

for your answer:(ii) $(-3,5),(3,1),(0,3),(-1,-4)$



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10. Name the type of quadrilateral formed,if any,by the following points,and give reasons

for your answer:(iii)(4,5),(7,6),(4,3),(1,2)



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



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



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13. If $Q(0,1)$ is equidistant from $P(5,-3)$ and $R(x,6)$. Find the values of x . Also find the distance 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 $(-2,-3)$.



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17. 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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18. 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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19. 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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20. 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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21. 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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22. 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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23. 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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24. Find the area of the triangle whose vertices are (i) $(2,3)$, $(-1,0)$, $(2,-4)$



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25. Find the area of the triangle whose vertices are.(ii) $(-5,-1),(3,-5),(5,2)$



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26. In each of the following find the value of 'k',for which the points are collinear.(i) $(7,-2), (5,1),(3,k)$



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



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28. 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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29. 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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30. You have studied in Class IX (Chapter 9,Example 3),that a median of a triangle divides in into two triangles of equal

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



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



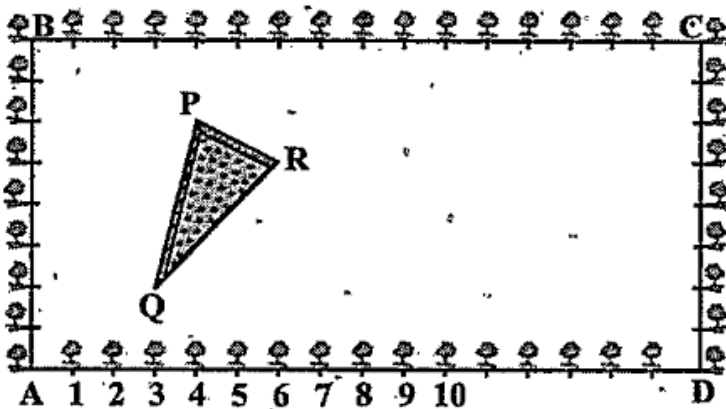
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33. Find the centre of a circle passing through the points $(6,-6)$, $(3,-7)$ and $(3,3)$.



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34. 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 Fig.7.14. The students are to sow seeds of flowering plants on the plot.



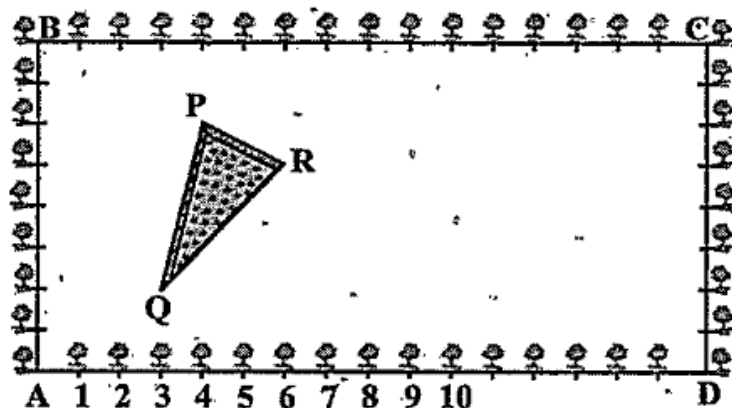
(i) Talking A as origin, find the coordinates of the vertices of the triangle



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35. 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 Fig.7.14. The students are

to sow seeds of flowering plants on the plot.



(ii) What will be the coordinates of the vertices of $\triangle PQR$ if C is the origin?



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36. Let $A(4,2), B(6,5)$ and $C(1,4)$ be the vertices of $\triangle ABC$. (i) The median from A meets BC at

D.Find the coordinates of the points D.



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



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38. Let $A(4,2), B(6,5)$ and $C(1,4)$ be the vertices of $\triangle ABC$.(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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39. Let $A(4,2), B(6,5)$ and $C(1,4)$ be the vertices of $\triangle ABC$.(iv)What do you observe?



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40. 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.



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41. 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 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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42. What is the distance of the point $P(4,-3)$ from the origin?



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43. What is the distance between $(0,5)$ and $(-5,0)$?



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44. If the distance between the point $A(2,-2)$ and $B(-1,x)$ is 5 then what is the value of x ?



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45. What is the distance of the point $P(2,3)$ from the x -axis?



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46. What is the Co-ordinate of midpoint of $(2a,0)$ and $(0,2a)$?



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47. If the point $A(4,3)$ and $B(x,5)$ are on the circle with centre $C(2,3)$ then find the value of x .



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48. If $A(-1,0)$, $B(5,-2)$ and $C(8,2)$ are the vertices of a $\triangle ABC$ then find its centroid.



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49. What is the x-coordinate on y-axis?



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50. What is the co-ordinate of origin?



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51. What is the image of point $(2,-3)$ under x -axis?



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52. The distance between the points $A(2,-3)$ and $B(2,2)$ is

a) 2 units b) 3 units c) 4 units d) 5 units

A. 2 units

B. 3 units

C. 4 units

D. 5 units

Answer:



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53. The distance of the point $P(-6,8)$ from the origin is

a)2 b)5 c)10 d) $\sqrt{2}$

A. 2

B. 5

C. 10

D. $\sqrt{2}$

Answer:



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54. The distance between the points $(\cos \theta, \sin \theta)$ and $(\sin \theta, -\cos \theta)$ is

a) 1 b) 2 c) $\sqrt{2}$ d) $\sqrt{3}$

A. 1

B. 2

C. $\sqrt{2}$

D. $\sqrt{3}$

Answer:



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55. The distance of the point (4,7) from the x-axis is

a)7 b)4 c) $\sqrt{65}$ d)11

A. 7

B. 4

C. $\sqrt{65}$

D. 11

Answer:



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56. The distance of the point (4,7) from the y-axis is

a)7 b)4 c) $\sqrt{65}$ d)11

A. 7

B. 4

C. $\sqrt{65}$

D. 11

Answer:



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57. If the point $P(x,y)$ is equidistant from $A(5,1)$ and $B(-1,5)$ is, then

A. $2x=3y$

B. $3x=2y$

C. $x=5y$

D. $5x=y$

Answer:



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58. The two vertices of a triangle are $A(6,3)$ and $B(-1,7)$ and its centroid is $G(1,5)$ then its third

vertex C of $\triangle ABC$ will be -

a)(2,5) b)(2,-5) c)(-2,5) d)(-2,-5)

A. (2,5)

B. (2,-5)

C. (-2,5)

D. (-2,-5)

Answer:



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59. If $A(0,3)$, $B(3,6)$ and $C(6,9)$ are the vertices of a triangle then its centroid will be

a) $(3,6)$ b) $(-3,-6)$ c) $(6,3)$ d) $(-6,-3)$

A. $(3,6)$

B. $(-3,-6)$

C. $(6,3)$

D. $(-6,-3)$

Answer:



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60. If three points $(0,0)$, $(-3, -6)$ and $(3,x)$ form an equilateral triangle then the value of x will be __ -

a)2 b)-3 c)-4 d)None of these

A. 2

B. -3

C. -4

D. None of these

Answer:



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61. If $P(a/3, 4)$ is the midpoint of the line segment joining $A(-6, 5)$ and $B(-2, 3)$ then the value of a will be

a) -6 b) -4 c) 12 d) -12

A. -6

B. -4

C. 12

D. -12

Answer:



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62. If $P(-1,1)$ is the midpoint of the line segment joining $A(-3,b)$ and $B(1,b+4)$ then the value of b will be

A. 0

B. 1

C. -1

D. 2

Answer:



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63. x-axis divide the line segment joining
A(2,-3) and B(5,6) in the ratio

A. 1 : 2

B. 2 : 1

C. 1 : 3

D. 3 : 1

Answer:



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64. y-axis divide the line segment joining
A(-4,2) and B(8,3) in the ratio

A. 1 : 2

B. 3 : 1

C. 1 : 3

D. 2 : 1

Answer:



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65. A(-4,0),B(4,0) and C(0,3) are the vertices of

-

a)an Equilateral triangle b)an Isosceles triangle
c)a Right angled triangle d)a Scalene triangle

A. an Equilateral triangle

B. an Isosceles triangle

C. a Right angled triangle

D. a Scalane triangle

Answer:



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66. If $A(2,2), B(-4,-4)$ and $C(5,-8)$ are the vertices of a triangle then the length of the median through vertex C is _--

A. $\sqrt{65}$

B. $\sqrt{85}$

C. $\sqrt{113}$

D. $\sqrt{117}$

Answer:



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67. If the centroid of a triangle is $(1,4)$ and two of its vertices are $(4,-3)$ and $(-9,7)$ then the area of the triangle is

A. 183 Sq.units

B. $183/2$ Sq.units

C. 366 Sq.units

D. $183/4$ Sq.units

Answer:



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68. If the points $A(1,2), B(0,0)$ and $C(a,b)$ are collinear then

A. $a+b=0$

B. $a=b$

C. $a=2b$

D. $2a=b$

Answer:



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69. If the points $A(2,3), B(5,k)$ and $C(6,7)$ are collinear then k is

A. $k=6$

B. $k=4$

C. $k=-3/2$

D. $k=11/4$

Answer:



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70. The area formed by $A(a, b + c), B(b, c+a)$
and $C(c, a+b)$ is

A. $(a + b + c)^2$

B. $a+b+c$

C. abc

D. 0

Answer:



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