



# MATHS

## BOOKS - RS AGGARWAL MATHS (HINGLISH)

### COORDINATE GEOMETRY

#### Solved Examples

1. Find the distance the points  $A(7, 13)$  and  $B(10, 9)$ .

A. 5

B. 6

C. 7

D. 8

**Answer: A**



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**2. Find the distance between the points  $P(-4, 7)$  and  $Q(2, -5)$ .**

A. 5

B. 6

C. 7

D.  $6\sqrt{5}$

**Answer: D**



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**3. Find the distance of the point  $(6, -6)$  from the origin**

A.  $6\sqrt{3}$

B. 6

C.  $6\sqrt{2}$

D.  $3\sqrt{2}$

**Answer: C**



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

A. -5

B. -6

C. 4

D. -7

**Answer: D**



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

A.  $k=2$

B.  $k=5$

C.  $k=0$

D.  $k=-1$

**Answer: B**



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**6.** 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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7. Find those points on  $x$ -axis, each of which is at a distance of 5 units from the point  $A(5, -3)$

A. (0,1)

B. (-1,0)

C. (1,9)

D. (0,9)

**Answer: C**



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8. Find those points on the y-axis, each of which is at a distance of 13 units from the point A(-5, 7).

A. (1, 19)

B. (2, 19)

C. (0, 19)

D. (1, 2)

**Answer: C**





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



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

A.  $(0, -7)$

B. (0, 7)

C. (0, -5)

D. (0, 5)

**Answer: A**



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**11.** Find the coordinates of the point equidistant from three given points

$A(5, 1)$ ,  $B(-3, -7)$  and  $C(7, -1)$ .



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**12.** 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.

A. 2 units

B. 3 units

C. 4 units

D. 5 units

**Answer: D**





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

A.  $(3, 1)$

B.  $(-3, -1)$

C.  $(-3, 1)$

D.  $(3, -2)$

**Answer: D**



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**14.** 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 values of  $p$ .

A. 7

B. 3

C. 5

D. 4

**Answer: D**



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



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**16.** Find the circumcenter of the triangle formed by the points  $(-3, 0)$ ,  $(1, -3)$  and  $(4, 1)$

A.  $(1, -3)$

B.  $(-3,0)$

C.  $\left(\frac{1}{2}, \frac{1}{2}\right)$

D.  $\left(\frac{1}{3}, \frac{1}{3}\right)$

**Answer: C**



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**17.** 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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**18.** 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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**19.** If  $P(2, -1)$ ,  $Q(3, 4)$ ,  $R(-2, 3)$  and  $S(-3, -2)$  be four points in a plane, show that  $PQRS$  is a rhombus but not a square. Find the area of the rhombus.



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**20.** Prove that points A (1, 1), B (- 2, 7) and C (3, - 3) are collinear.



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**21.** Find the coordinates of the point which divides the line segment joining the points A(4, -3) and B(9, 7) in the ratio: 3:2.



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22. Find the coordinates of the midpoint of the line segment joining the points A(-5, 4) and B(7, -8).

A. (-1, 2)

B. (1, -2)

C. (2, -4)

D. (1, 1)

**Answer: B**



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



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

A.  $(3, 4)$

B.  $(5, 4)$

C. (7, 4)

D. (3, 5)

**Answer: A**



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

A.  $-7$

B.  $-8$

C.  $-9$

D.  $-11$

**Answer: B**



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**26.** In what ratio does the point  $P(2, -5)$  divide the line segment joining  $A(-3, 5)$  and  $B(4, -9)$ ?



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**27.** 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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**28.** 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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**29.** If the point  $C(-1, 2)$  divides internally the line segment joining  $A(2, 5)$  and  $B$  in ratio 3:4, find the coordinates of  $B$ .



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**30.** Find the lengths of the medians of a  $ABC$  whose vertices are  $A(7, -3)$ ,  $B(5, 3)$  and  $C(3, -1)$ .



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**31.** The three vertices of a parallelogram  $ABCD$  taken in order are  $A(3, -4)$ ,  $B(-1, -3)$  and  $C(-6, 2)$ . Find the coordinates of the fourth vertex  $D$ .



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**32.** If  $(3, 3)$ ,  $(6, y)$ ,  $(x, 7)$  and  $(5, 6)$  are the vertices of a parallelogram taken in order, find the value of  $x$  and  $y$ .



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**33.** Let  $D(3, -2)$ ,  $E(-3, 1)$  and  $F(4, -3)$  be the midpoints of the sides  $BC$ ,  $CA$  and  $AB$  respectively of  $\triangle ABC$ . Then, find the coordinates the vertices  $A$ ,  $B$  and  $C$ .



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**34.** The coordinates of one end point of a diameter of a circle are  $(4, -1)$  and the coordinates of the centre of the circle are  $(1, -3)$ . Find the coordinates of the other end of the diameter.



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**35.** Find the centroid of  $\triangle ABC$  whose vertices are  $A(-3, 0)$ ,  $B(5, -2)$ , and  $C(-8, 5)$ .



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**36.** 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 coordinates of the third vertex  $C$  of  $\Delta ABC$ .



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**37.** Find the area of  $\Delta ABC$  whose vertices are  $A(2, 7)$ ,  $B(3, -1)$  and  $C(-5, 6)$ .



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**38.** Find the values of  $k$  so that the area of the triangle with vertices  $(1, -1)$ ,  $(-4, 2k)$  and  $(-k, -5)$  is 24 sq. units.



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**39.** If  $A(4, -6)$ ,  $B(3, -2)$  and  $C(5, 2)$  are the vertices of  $ABC$ , then verify the fact that a median of a triangle  $ABC$  divides it into two triangles of equal areas.



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**40.** Find the area of the triangle formed by joining the midpoints of the sides of the triangle whose vertices are  $A(2, 2)$ ,  $B(4, 4)$  and  $C(2, 6)$ .



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



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**42.** Find the area of a parallelogram  $ABCD$  if three of its vertices are  $A(2, 4)$ ,  $B(2 + \sqrt{3}, 5)$  and  $C(2, 6)$ .

A.  $(2\sqrt{3})$

B.  $(3\sqrt{4})$

C.  $(4\sqrt{5})$

D.  $(6\sqrt{5})$

**Answer: A**



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**43.** If the points  $A(1, -2)$ ,  $B(2, 3)$ ,  $C(-3, 2)$  and  $D(-4, -3)$  are the vertices of parallelogram  $ABCD$ , then taking  $AB$  as the base, find the height of the parallelogram.



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**44.** Show that the points  $A(-1, 1)$ ,  $B(5, 7)$  and  $C(8, 10)$  are collinear.



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**45.** Show that points  $A(a, b + c)$ ,  $B(b, c + a)$ ,  $C(c, a + b)$  are collinear.



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**46.** 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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**47.** Find the value of  $k$  for which the points  $A(k+1, 2k)$ ,  $B(3k, 2k + 3)$  and  $C(5k-1, 5k)$  are collinear.



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**48.** If the points  $A(-1, -4)$ ,  $B(b, c)$  and  $C(5, -1)$  are collinear and  $2b + c = 4$ , find the values of  $b$  and  $c$ .



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**49.** If  $R(x, y)$  is a point on the line segment joining the points  $P(a, b)$  and  $Q(b, a)$ , then prove that  $x + y = a + b$



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## Exercise 6 A

**1.** Find the distance between the points :

(i)  $A(9, 3)$  and  $B(15, 11)$  (ii)  $A(7, -4)$  and  $B(-5, 1)$

(iii)  $A(-6, -4)$  and  $B(9, -12)$  (iv)  $A(1, -3)$  and  $B(4, -6)$

(v)  $P(a+b, a-b)$  and  $Q(a-b, a+b)$

(vi)  $P(a \sin \alpha, a \cos \alpha)$  and  $Q(a \cos \alpha, -a \sin \alpha)$



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

(i)  $A(5, -12)$  (ii)  $B(-5, 5)$  (iii)  $C(-4, -6)$ .



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3. Find all possible values of  $x$  for which for distance between the points  $A(x, -1)$  and  $B(5, 3)$  is 5 units.



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4. 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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5. Find the values of  $x$  for which the distance between the points  $P(x, 4)$  and  $Q(9, 10)$  is 10 units.



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6. If the point  $A(x, 2)$  is equidistant from the points  $B(8, -2)$  and  $C(2, -2)$ , find the value of  $x$ . Also, find the length of  $AB$ .



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7. If the point  $A(0, 2)$  is equidistant from the points  $B(3, p)$  and  $C(p, 5)$ , find  $p$ . Also, find the length of  $AB$ .



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



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**9.** Find points on the x-axis, each of which is at a distance of 10 units from the point  $A(11, -8)$ .



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



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**11.** If the point  $P(x, y)$  is equidistant from the points  $A(5, 1)$  and  $B(-1, 5)$ , prove that  $3x = 2y$ .



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**12.** If  $P(x, y)$  is a point equidistant from the points  $A(6, -1)$  and  $B(2, 3)$ , show that  $x - y = 3$ .



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**13.** Find the coordinates of the point equidistant from three given points  $A(5, 3)$ ,  $B(5, -5)$  and  $C(1, -5)$



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**14.** If the points  $A(4, 3)$  and  $B(x, 5)$  lie on a circle with the centre  $O(2, 3)$ , find the value of  $x$ .



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**15.** If the point  $C(-2, 3)$  is equidistant from the points  $A(3, -1)$  and  $B(x, 8)$ , find the values of  $x$ . Also, find the distance  $BC$ .



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**16.** If the point  $P(2, 2)$  is equidistant from the points  $A(-2, k)$  and  $B(-2k, -3)$ , find  $k$ . Also, find the length of  $AP$ .



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

(ii) If the distances of  $P(x, y)$  from  $A(5, 1)$  and  $B(-1, 5)$  are equal then prove that  $3x = 2y$ .



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18. Using the distance formula, show that the given points are collinear.

(i)  $(1, -1)$ ,  $(5, 2)$  and  $(9, 5)$  (ii)  $(6, 9)$ ,  $(0, 1)$  and  $(-6, -7)$

(iii)  $(-1, -1)$ ,  $(2, 3)$  and  $(8, 11)$  (iv)  $(-2, 5)$ ,  $(0, 1)$  and  $(2, -3)$ .



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**19.** Show that the points  $A(7, 10)$ ,  $B(-2, 5)$  and  $C(3, -4)$  are the vertices of an isosceles right triangle.



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**20.** Show that the points  $A(3, 0)$ ,  $B(6, 4)$  and  $C(-1, 3)$  are the vertices of an isosceles right triangle.



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**21.** If  $A(5, 2)$ ,  $B(2, -2)$  and  $C(-2, t)$  are the vertices of a right triangle with  $\angle B = 90^\circ$  then find the value of  $t$ .



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**22.** Prove that the points  $A(2, 4)$ ,  $B(2, 6)$  and  $C(2 + \sqrt{3}, 5)$  are the vertices of an equilateral triangle.



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



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24. The points  $A(-5, 6)$ ,  $B(3, 0)$  and  $C(9, 8)$  are the vertices of an isosceles right-angled triangle. Calculate its area.

A. 30

B. 50

C. 100

D. None of these

**Answer: B**



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**25.** Show that the points  $O(0, 0)$ ,  $A(3, \sqrt{3})$  and  $B(3, -\sqrt{3})$  are the vertices of an equilateral triangle. Find the area of this triangle.



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**26.** Show that the following points are the vertices of a square:

(i)  $A(3, 2)$ ,  $B(0, 5)$ ,  $C(-3, 2)$  and  $D(0, -1)$

(ii)  $A(6, 2)$ ,  $B(2, 1)$ ,  $C(1, 5)$  and  $D(5, 6)$

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





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**27.** Show that the points  $A(-3, 2)$ ,  $B(-5, -5)$ ,  $C(2, -3)$  and  $D(4, 4)$  are the vertices of a rhombus. Find the area of this rhombus.



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**28.** Show that the points  $A(3, 0)$ ,  $B(4, 5)$ ,  $C(-1, 4)$  and  $D(-2, -1)$  are the vertices of a rhombus. Find its area.



29. Show that the points  $A(6, 1)$ ,  $B(8, 2)$ ,  $C(9, 4)$  and  $D(7, 3)$  are the vertices of a rhombus. Find its area.

A. 6 sq units

B. 3 sq units

C.  $3/2$  sq units

D. 1 sq units

**Answer: B**



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**30.** Show that the points  $A(2, 1)$ ,  $B(5, 2)$ ,  $C(6, 4)$  and  $D(3, 3)$  are the angular points of a parallelogram. Is this figure a rectangle?



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**31.** Show that  $A(1, 2)$ ,  $B(4, 3)$ ,  $C(6, 6)$  and  $D(3, 5)$  are the vertices of a parallelogram. Show that  $ABCD$  is not a rectangle.





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

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

(ii)  $A(2, -2)$ ,  $B(14, 10)$ ,  $C(11, 13)$  and  $D(-1, 1)$

(iii)  $A(0, -4)$ ,  $B(6, 2)$ ,  $C(3, 5)$  and  $D(-3, -1)$



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**33.** Show that  $\triangle ABC$  with vertices  $A(-2, 0)$ ,  $B(0, 2)$  and  $C(2, 0)$  is similar to  $\triangle DEF$  with

vertices  $D(-4, 0)$ ,  $F(4, 0)$  and  $E(0, 4)$ .



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**34.** 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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1. Find the coordinates of the point which divides the join of  $A(-1, 7)$  and  $B(4, -3)$  in the ratio 2:3.

A.  $\left(\frac{10}{3}, \frac{-20}{3}\right)$

B.  $\left(2, \frac{8}{3}\right)$

C.  $(3, 1)$

D.  $(1, 3)$

**Answer: D**



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2. Find the coordinates of the points of trisection of the line segment joining the points A(7, -2) and B(1, 5).



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



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4. Point A lies on the line segment PQ joining P(6, -6) and Q(-4, -1) in such a way that  $\frac{PA}{PQ} = \frac{2}{5}$ . If the point A also lies on the line  $3x+k(y+1) = 0$ , find the value of k.



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5. Points P, Q, R and S divide the line segment joining the points A(1, 2) and B(6, 7) in five equal parts. Find the coordinates of the point P.



A.  $P(3, 4)$

B.  $P(4, 5)$

C.  $P(2, 3)$

D.  $P(2, 1)$

**Answer: C**



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**6.** Points P, Q and R in that order are dividing a line segment joining  $A(1, 6)$  and  $B(5, -2)$ , in four equal parts. Find the coordinates of P, Q and R.



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7. The line segment joining the points  $A(3, -4)$  and  $B(1, 2)$  is trisected at the points  $P(p, -2)$  and  $Q\left(\frac{5}{3}, q\right)$ . Find the values of  $p$  and  $q$ .



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8. Find the coordinates of the midpoint of the line segment joining

(i)  $A(3, 0)$  and  $B(-5, 4)$  (ii)  $P(-11, -8)$  and  $Q(8, -2)$ .



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9. If  $(2, p)$  is the midpoint of the line segment joining the points  $A(6, -5)$  and  $B(-2, 11)$ , find the value of  $p$ .

A.  $p = 3$

B.  $p = 5$

C.  $p = -2$

D.  $p = 8$

**Answer: A**



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**10.** The midpoint of the line segment joining  $A(2a, 4)$  and  $B(-2, 3b)$  is  $C(1, 2a+1)$ . Find the values of  $a$  and  $b$ .



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**11.** The line segment joining  $A(-2, 9)$  and  $B(6, 3)$  is a diameter of a circle with centre  $C$ . Find the coordinates of  $C$ .



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**12.** Find the coordinates of a point A, where AB is a diameter of a circle with centre  $C(2, -3)$  and the other end of the diameter is  $B(1, 4)$ .



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**13.** In what ratio does the point  $P(2, 5)$  divide the join of  $A(8, 2)$  and  $B(-6, 9)$ ?



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**14.** Find the ratio in which the point  $P\left(\frac{3}{4}, \frac{5}{12}\right)$  divides the line segment joining the points  $A\left(\frac{1}{2}, \frac{3}{2}\right)$  and  $B(2, -5)$ .



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**15.** Find the ratio in which the point  $P(m, 6)$  divides the join of  $A(-4, 3)$  and  $B(2, 8)$ .  
Also, find the value of  $m$ .

A.  $\frac{-2}{5}$

B.  $\frac{2}{5}$

C.  $-2$

D. None of these

**Answer: A**



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**16.** Find the ratio in which the point  $(-3, k)$  divides the join of  $A(-5, -4)$  and  $B(-2, 3)$ . Also, find the value of  $k$ .



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**17.** In what ratio is the line segment joining  $A(2, -3)$  and  $B(5, 6)$  divided by the  $x$ -axis? Also, find the coordinates of the point of division.



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**18.** In what ratio is the line segment joining the points  $A(-2, -3)$  and  $B(3, 7)$  divided by the  $y$ -axis? Also, find the coordinates of the point of division.





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



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**20.** Find the lengths of the medians of a  $\triangle ABC$  whose vertices are  $A(0, -1)$ ,  $B(2, 1)$  and  $C(0, 3)$ .



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



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22. If  $G(-2, 1)$  is the centroid of a  $\triangle ABC$  and two of its vertices are  $A(1, -6)$  and  $B(-5, 2)$ , find the third vertex of the triangle.



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**23.** Find the third vertex of a  $\triangle ABC$  if two of its vertices are  $B(-3, 1)$  and  $C(0, -2)$ , and its centroid is at the origin.



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**24.** Show that the points  $A(3, 1)$ ,  $B(0, -2)$ ,  $C(1, 1)$  and  $D(4, 4)$  are the vertices of a parallelogram  $ABCD$ .



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25. If the points  $P(a, -11)$ ,  $Q(5, b)$ ,  $R(2, 15)$  and  $S(1, 1)$  are the vertices of a parallelogram PQRS, find the values of  $a$ .

A. 5

B. 3

C. 4

D. 2

**Answer: C**



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26. If three consecutive vertices of a parallelogram are  $(1, -2)$ ,  $(3, 6)$  and  $(5, 10)$ , find its fourth vertex.



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27. In what ratio does  $y$ -axis divide the line segment joining the points  $(-4, 7)$  and  $(3, -7)$ ?



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**28.** If the point  $P\left(\frac{1}{2}, y\right)$  lies on the line segment joining the points  $A(3, -5)$  and  $B(-7, -9)$  the find the ratio in which  $P$  divides  $AB$ . Also, find the value of  $y$ .



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**29.** Find the ratio in which the line segment joining the points  $A(3, -3)$  and  $B(-2, 7)$  is divided by  $x$ -axis. Also, find the point of division.



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30. The base  $QR$  of an equilateral triangle  $PQR$  lies on  $x$ -axis. The coordinates of the point  $Q$  are  $(-4, 0)$  and origin is the midpoint of the base. Find the coordinates of the points  $P$  and  $R$ .

A.  $P(0, 5\sqrt{4})$  or  $P(0, -5\sqrt{4})$  and  $R(3, 2)$

B.  $P(0, 4\sqrt{3})$  or  $P(0, -4\sqrt{3})$  and  $R(4, 0)$

C.  $P(0, 3\sqrt{2})$  or  $P(0, -3\sqrt{2})$  and  $R(3, 1)$

D.  $P(0, 2\sqrt{5})$  or  $P(0, -2\sqrt{5})$  and  $R(3, 5)$

**Answer: B**



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**31.** The base BC of an equilateral triangle ABC, lies on y-axis. The coordinates of point C are (0, -3). The origin is the midpoint of the base.

Find the coordinates of the points A and B.



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**32.** Find the ratio in which the point  $P(-1, y)$  lying on the line segment joining points  $A(-3, 10)$  and  $B(6, -8)$  divides it. Also, find the value of  $y$ .



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**33.** ABCD is rectangle formed by the points  $A(-1, -1)$ ,  $B(-1, 4)$ ,  $C(5, 4)$  and  $D(5, -1)$ . If  $P$ ,  $Q$ ,  $R$  and  $S$  be the midpoint of  $AB$ ,  $BC$ ,  $CD$  and  $DA$  respectively, show that PQRS is a rhombus.





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**34.** The midpoint  $P$  of the line segment joining the points  $A(-10, 4)$  and  $B(-2, 0)$  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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**35.** A line intersects the  $Y$ - axis at the points  $P$  and  $Q$ , respectively. If  $(2, -5)$  is the mid- point of

PQ , then the coordinates of P and Q are ,  
respectively



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**36.** 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  $y$ .

A.  $2:8; y = -\frac{9}{11}$

B.  $2:9; y = -\frac{4}{11}$

C.  $5:9; y = -\frac{3}{11}$

D.  $1:9; y = -\frac{7}{11}$

**Answer: B**



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**37.** The midpoints of the sides BC, CA and AB of a  $\triangle ABC$  are D(3, 4), E(8, 9) and F(6, 7) respectively. Find the coordinates of the vertices of the triangle.



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**38.** If two vertices of a parallelogram are  $(3, 2)$ ,  $(-1, 0)$  and the diagonals cut at  $(2, -5)$ , find the other vertices of the parallelogram.



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**Exercise 6 C**

1. Find the area of  $\Delta ABC$  whose vertices are :

(i) A(1, 2), B (-2, 3) and C(-3, -4)

(ii) A(-5, 7), B(-4, -5) and C(4, 5)

(iii) A(3, 8), B(-4, 2) and C(5, -1)

(iv) A(10, -6), B(2, 5) and C(-1, 3)



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2. Find the area of quadrilateral ABCD whose vertices are A(3, -1), B(9, -5), C(14, 0) and D(9, 19).





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3. If

$P(-5, -3)$ ,  $Q(-4, -6)$ ,  $R(2, -3)$

and  $S(1, 2)$  are the vertices of a quadrilateral

$PQRS$ , find its area.



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4. Find the area of quadrilateral ABCD whose vertices are  $A(-3, -1)$ ,  $B(-2, -4)$ ,  $C(4, -1)$  and  $D(3, 4)$ .



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5. If  $A(-7, 5)$ ,  $B(-6, -7)$ ,  $C(-3, -8)$  and  $D(2, 3)$  are the vertices of a quadrilateral ABCD then find the area of the quadrilateral.



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6. Find the area of the triangle formed by joining the midpoints of the sides of the triangle whose vertices are  $A(2, 1)$ ,  $B(4, 3)$  and  $C(2, 5)$ .





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7.  $A(7, -3)$ ,  $B(5, 3)$  and  $C(3, -1)$  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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8. Find the area of  $\triangle ABC$  with  $A(1, -4)$  and midpoints of sides through  $A$  being  $(2, -1)$  and  $(0, -1)$ .

A. 19 sq units

B. 14 sq units

C. 13 sq units

D. 12 sq units

**Answer: D**



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9. A(6, 1), B(8, 2) and C(9, 4) are the vertices of a parallelogram ABCD. If E is the midpoint of DC, find the area of  $\triangle ADE$ .



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10. (i) If the vertices of  $\triangle ABC$  be  $A(1, -3)$ ,  $B(4, p)$  and  $C(-9, 7)$  and its area is 15 square units, find the value of  $p$ .

(ii) 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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**11.** Find the value of  $k$  so that the area of the triangle with vertices  $A(k+1, 1)$ ,  $B(4, -3)$  and  $C(7, -k)$  is 6 square units.



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**12.** For what value of  $k$  ( $k > 0$ ) is the area of the triangle with vertices  $(-2, 5)$ ,  $(k, -4)$  and  $(2k+1, 10)$  equal to 53 square units?



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**13.** Show that the following points are collinear:

(i)  $A(2, -2)$ ,  $B(-3, 8)$  and  $C(-1, 4)$

(ii)  $A(-5, 1)$ ,  $B(5, 5)$  and  $C(10, 7)$

(iii)  $A(5, 1)$ ,  $B(1, -1)$  and  $C(11, 4)$

(iv)  $A(8, 1)$ ,  $B(3, -4)$  and  $C(2, -5)$



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**14.** Find the value of  $x$  for which the points  $A(x, 2)$ ,  $B(-3, -4)$  and  $C(7, -5)$  are collinear.



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**15.** For what value of  $x$  are the points  $A(-3, 12)$ ,  $B(7, 6)$  and  $C(x, 9)$  collinear?



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**16.** For what value of  $y$  are the points  $P(1, 4)$ ,  $Q(3, y)$  and  $R(-3, 16)$  are collinear?



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**17.** Find the value of  $y$  for which the points  $A(-3, 9)$ ,  $B(2, y)$  and  $C(4, -5)$  are collinear.



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**18.** For what values of  $k$  are the points  $A(8, 1)$ ,  $B(3, -2k)$  and  $C(k, -5)$  collinear.



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**19.** Find a relation between  $x$  and  $y$ , if the points  $A(2, 1)$ ,  $B(x, y)$  and  $C(7, 5)$  are collinear.



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



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21. Prove that the points  $A(a, 0)$ ,  $B(0, b)$  and  $C(1, 1)$  are collinear, if  $\frac{1}{a} + \frac{1}{b} = 1$ .



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22. If the points  $P(-3, 9)$ ,  $Q(a, b)$  and  $R(4, -5)$  are collinear and  $a+b = 1$ , find the values of  $a$  and  $b$ .



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**23.** Find the area of  $\triangle ABC$  with vertices  $A(0, -1)$ ,  $B(2, 1)$  and  $C(0, 3)$ . Also, find the area of the triangle formed by joining the midpoints of its sides.

Show that the ratio of the areas of two triangles is 4:1.



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**24.**

if

$a \neq b \neq c$ , prove that  $(a, a^2)$ ,  $(b, b^2)$ ,  $(0, 0)$

will not be collinear.



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## Exercise 6 D

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



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2. If the point  $A(0, 2)$  is equidistant from the points  $B(3, p)$  and  $C(p, 5)$ , find  $p$ .



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3. ABCD is rectangle whose three vertices are  $B(4, 0)$ ,  $C(4, 3)$  and  $D(0, 3)$ . Find the length of one of its diagonal.



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



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5. Find the ratio in which the point  $P(x, 2)$  divides the join of  $A(12, 5)$  and  $B(4, -3)$ .

A.  $5 : 3$

B.  $3 : 5$

C.  $1 : 3$

D. 3 : 2

**Answer: B**



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**6.** Prove that the diagonals of a rectangle ABCD with vertices  $A(2, -1)$ ,  $B(5, -1)$ ,  $C(5, 6)$  and  $D(2, 6)$  are equal and bisect each other.



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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 point  $C(k, 4)$  divides the join of  $A(2, 6)$  and  $B(5, 1)$  in the ratio 2:3 then find the value of  $k$ .



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9. Find the point on x-axis which is equidistant from points A(-1, 0) and B(5, 0).



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10. Find the distance between the points  $\left(\frac{-8}{5}, 2\right)$  and  $\left(\frac{2}{5}, 2\right)$



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



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**12.** If the points  $A(4, 3)$  and  $B(x, 5)$  lie on a circle with the centre  $O(2, 3)$ , find the value of  $x$ .



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**13.** If  $P(x, y)$  is equidistant from the points  $A(7, 1)$  and  $B(3, 5)$ , find the relation between  $x$  and  $y$ .



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**14.** If the centroid of  $\triangle ABC$  having vertices  $A(a, b)$ ,  $B(b, c)$  and  $C(c, a)$  is the origin, then find the value of  $(a+b+c)$ .



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**15.** Find the centroid of  $\triangle ABC$  whose vertices are  $A(2, 2)$ ,  $B(-4, -4)$  and  $C(5, -8)$ .



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**16.** In what ratio does the point  $C(4, 5)$  divide the join of  $A(2, 3)$  and  $B(7, 8)$ ?



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17. If the points  $A(2, 3)$ ,  $B(4, k)$  and  $C(6, -3)$  are collinear, find the value of  $k$ .



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## Multiple Choice Questions Mcq

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

A. 8

B.  $2\sqrt{7}$

C. 6

D. 10

**Answer: D**



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2. The distance of the point  $(-3, 4)$  from x -axis is

A. 3

B.  $-3$

C. 4

D. 5

**Answer: C**



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**3.** The point on x-axis which is equidistant from points A  $(-1, 0)$  and B  $(5, 0)$  is

A.  $(0, 2)$

B. (2, 0)

C. (3, 0)

D. (0, 3)

**Answer: B**



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4. If  $R(5, 6)$  is the midpoint of the line segment  $AB$  joining the points  $A(6, 5)$  and  $B(4, 4)$  then  $y$  equals

A. 5

B. 7

C. 12

D. 6

**Answer: B**



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5. If the point  $C(k, 4)$  divides the join of  $A(2, 6)$  and  $B(5, 1)$  in the ratio  $2:3$  then find the value of  $k$ .



A. 16

B.  $\frac{28}{5}$

C.  $\frac{16}{5}$

D.  $\frac{8}{5}$

**Answer: C**



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**6.** The perimeter of the triangle with vertices  $(0, 4)$ ,  $(0, 0)$  and  $(3, 0)$  is

A.  $(7 + \sqrt{5})$

B. 5

C. 10

D. 12

**Answer: D**



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7. If  $A(1, 3)$ ,  $B(-1, 2)$ ,  $C(2, 5)$  and  $D(x, 4)$  are the vertices of a parallelogram ABCD then the value of  $x$  is

A. 3

B. 4

C. 0

D.  $\frac{3}{2}$

**Answer: B**



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**8.** If the points  $A(x, 2)$ ,  $B(-3, -4)$  and  $C(7, -5)$  are collinear then the value of  $x$  is ?

A.  $-63$

B.  $63$

C.  $60$

D.  $-60$

**Answer: A**



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**9.** The area of a triangle with vertices  $A(5, 0)$ ,  $B(8, 0)$  and  $C(8, 4)$  in square units is

A. 20

B. 12

C. 6

D. 16

**Answer: C**



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**10.** The area of  $\triangle ABC$  with vertices  $A(a, 0)$ ,  $O(0, 0)$  and  $B(0, b)$  in square units is

A.  $ab$

B.  $\frac{1}{2}ab$

C.  $\frac{1}{2}a^2b^2$

D.  $\frac{1}{2}b^2$

**Answer: B**



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11. If  $P\left(\frac{a}{2}, 4\right)$  is the midpoint of the line segment joining the points  $A(-6, 5)$  and  $B(-2, 3)$  then the value of  $a$  is

A.  $-8$

B.  $3$

C.  $-4$

D.  $4$

**Answer: A**



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**12.** ABCD is a rectangle whose three vertices are  $B(4, 0)$ ,  $C(4, 3)$  and  $D(0, 3)$ . The length of one of its diagonals is

A. 5

B. 4

C. 3

D. 25

**Answer: A**



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**13.** The coordinates of the point P dividing the line segment joining the points A(1, 3) and B(4, 6) in the ratio 2:1 is



A. (2, 4)

B. (3, 5)

C. (4, 2)

D. (5, 3)

**Answer: B**



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**14.** If the coordinates of one end of a diameter of a circle are (2, 3) and the coordinates of its

centre are  $(-2,5)$ , then the coordinates of the other end of the diameter are

A.  $(-6, 7)$

B.  $(6, -7)$

C.  $(4, 2)$

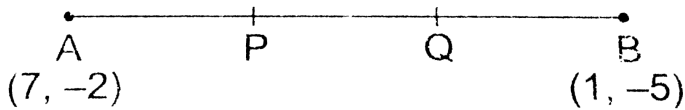
D.  $(5, 3)$

**Answer: A**



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15. In the given figure  $P(5, -3)$  and  $Q(3, y)$  are the points of trisection of the line segment joining  $A(7, -2)$  and  $B(1, -5)$ . Then,  $y$  equals



A. 2

B. 4

C.  $-4$

D.  $\frac{-5}{2}$

**Answer: C**



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16. The midpoint of segment AB is  $P(0, 4)$ . If the coordinates of B are  $(-2, 3)$ , then the coordinates of A are

A.  $(2, 5)$

B.  $(-2, -5)$

C.  $(2, 9)$

D.  $(-2, 11)$

**Answer: A**



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17. The point P which divides the line segment joining the points A(2, 5) and B(5, 2) in the ratio 2 : 3 lies in the quadrant

A. I

B. II

C. III

D. IV

**Answer: D**



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18. If  $A(-6, 7)$  and  $B(-1, -5)$  are two given points then the distance  $2AB$  is

A. 13

B. 26

C. 169

D. 238

**Answer: B**



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

A.  $(0, 4)$

B.  $(-4, 0)$

C.  $(3, 0)$

D.  $(0, 3)$

**Answer: C**



20. The distance of  $P(3, 4)$  from the x-axis is

A. 3 units

B. 4 units

C. 5 units

D. 1 unit

**Answer: B**



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21. In what ratio does the x-axis divide the join of A(2, -3) and B(5, 6)?

A. 2 : 3

B. 3 : 5

C. 1 : 2

D. 2 : 1

**Answer: C**



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

A. 3 : 1

B. 1 : 3

C. 2 : 1

D. 1 : 2

**Answer: D**



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23. If  $P(-1, 1)$  is the midpoint of the line segment joining  $A(-3, b)$  and  $B(1, b + 4)$  then  $b = ?$

A. 1

B. -1

C. 2

D. 0

**Answer: B**



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

A. 2:5

B. 2:9

C. 2:7

D. 2:3

**Answer: B**



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25. If  $A(4, 2)$ ,  $B(6, 5)$  and  $C(1, 4)$  be the vertices of  $\triangle ABC$  and  $AD$  is a median, then the coordinates of  $D$  are

A.  $\left(\frac{5}{2}, 3\right)$

B.  $\left(5, \frac{7}{2}\right)$

C.  $\left(\frac{7}{2}, \frac{9}{2}\right)$

D. none of these

**Answer: C**



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

A.  $(12, 0)$

B.  $(6, 0)$

C.  $(0, 6)$

D.  $(4, 0)$

**Answer: D**



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27. Two vertices of  $\triangle ABC$  are  $A(-1, 4)$  and  $B(5, 2)$  and its centroid is  $G(0, -3)$ . Then, the coordinates of  $C$  are

A.  $(4, 3)$

B.  $(4, 15)$

C.  $(-4, -15)$

D.  $(-15, -4)$

**Answer: C**



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28. The points  $A(-4, 0)$ ,  $B(4, 0)$  and  $C(0, 3)$  are the vertices of a triangle, which is

A. isosceles

B. equilateral

C. scalene

D. right angled

**Answer: A**



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29. The points  $P(0, 6)$ ,  $Q(-5, 3)$  and  $R(3, 1)$  are the vertices of a triangle which is

- A. equilateral
- B. isosceles
- C. scalene
- D. right angled

**Answer: D**



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

A.  $k = 4$

B.  $k = 6$

C.  $k = \frac{-3}{2}$

D.  $k = \frac{11}{4}$

**Answer: B**



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

A.  $a = b$

B.  $a = 2b$

C.  $2a = b$

D.  $a + b = 0$

**Answer: C**



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32. The area of a triangle with vertices  $A(3,0)$ ,  $B(7,0)$  and  $C(8,4)$  is

A. 14sq units

B. 28 sq units

C. 8 sq units

D. 6 sq units

**Answer: C**



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**33.** If AOBC is a rectangle whose three vertices are A(0,3), O(0,0) and B(5,0), then the length of its diagonal is

A. 5 units

B. 3 units

C. 4 units

D.  $\sqrt{34}$  units

**Answer: D**



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**34.** If the distance between the points  $(4, p)$  and  $(1, 0)$  is 5, then  $p = ?$

A.  $p = 4$  only

B.  $p = -4$  only

C.  $p = \pm 4$

D.  $p = 0$

**Answer: C**



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