

## CO-ORDINATE GEOMETRY

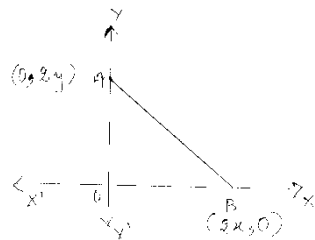
### MCQ

1. Distance between the points (5, -3) and (8, 1) is  
(a) 5 units (b) 6 units (c) 25 units (d) none of these
2. If the distance between (4, 0) and (0, x) is 5 units, then x is  
(a) 2 (b) 3 (c) 4 (d) 5
3. Three points are collinear if they lie on a  
(a) line (b) plane (c) both (a) & (b) (d) none of these
4. If the points (x, y), (2, 3) & (-3, 4) are collinear then  
(a)  $x + y = 17$  (b)  $x - y = 17$  (c)  $x - 5y = 17$  (d)  $x + 5y = 17$
5. P is a point on x-axis at a distance 3 units from y-axis to its right the coordinates of P are  
(a) (3, 0) (b) (0, 3) (c) (3, 3) (d) (-3, 3)
6. The distance of point A(4, -3) from the origin is  
(a) 1 unit (b) 7 units (c) 5 units (d) 3 units
7. The co-ordinates of 2 points are (6, 0) & (0, 8). The co-ordinates of the midpoints are  
(a) (3, 4) (b) (6, 8) (c) (0, 0) (d) (4, 3)
8. What point on the x-axis is equidistant from the point A(7, 6) & B(-3, 4) ?  
(a) (0, 4) (b) (-4, 0) (c) (3, 0) (d) (0, 3)
9. X-axis divides the join of A(2, -3) & B(5, 6) in ratio  
(a) 1 : 2 (b) 2 : 1 (c) 3 : 2 (d) 2 : 3
10. If the distance of P(x, y) from A(5, 1) and B(-1, 5) is same the which of the following is true  
(a)  $3x = 4y$  (b)  $x = 2y$  (c)  $3x = 2y$  (d)  $x = 3y$
11. If P(-1, 1) is the middle point of the line segment joining Q(-3, b) and R(1, b+4), then b is  
(a) 1 (b) -1 (c) 2 (d) 0
12. The 3<sup>rd</sup> vertex of an equilateral triangle whose other 2 vertices are (1, 1) and (-1, -1) is  
(a)  $(\sqrt{3}, -\sqrt{3})$  (b) both a & b (c)  $(-\sqrt{3}, \sqrt{3})$  (d) none of these
13. The centroid of the triangle having vertices (7, 5), (5, 7) and (-3, 3) is  
(a) (3, -5) (b) (-3, 5) (c) (-3, -5) (d) (3, 5)
14. 2 vertices of  $\Delta ABC$  are A(-1, 4) & B(5, 2) and its centroid is G(0, -3). The coordinate of C are  
(a) (4, 3) (b) (4, 15) (c) (-4, -15) (d) (-15, -4)
15. If the vertices of a triangle be  $(x_1, y_1)$ ,  $(x_2, y_2)$  and  $(x_3, y_3)$  then the coordinates of its centroid are  
(a)  $\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$  (b)  $\left(\frac{x_1 + x_3}{2}, \frac{y_1 + y_2}{2}\right)$

- (c)  $\left( \frac{x_1 + x_2 + x_3}{3}, \frac{y_1 + y_2 + y_3}{3} \right)$  (d) None of these

16. The coordinate of 3<sup>rd</sup> vertex of a triangle having other two vertices  $(-3, 1)$   $(0, -2)$  & coordinate of the centroid  $(0, 0)$  is  
 (a)  $(1, 3)$  (b)  $(3, 1)$  (c)  $(-1, 3)$  (d)  $(-1, -3)$
17. The centre of circle is  $(-1, 3)$  and one end of a diameter has coordinate  $(2, 5)$ . The co-ordinate of other ends are :  
 (a)  $(-4, 1)$  (b)  $(1, -4)$  (c)  $(4, -1)$  (d) None of these
18. If 2 vertices of a llgm are  $(3, 2)$  and  $(-1, 0)$  & the diagonals intersect at  $(2, -5)$ , then other 2 vertices are  
 (a)  $(1, -10), (5, -12)$  (b)  $(1, -12), (5, -10)$   
 (c)  $(2, -10), (5, -12)$  (d)  $(1, -10), (2, -12)$
19. If the co-ordinate of middle point of the line segment joining the points  $(2, 1)$  and  $(1, -3)$  be  $(\alpha, \beta)$  then which of the following is true ?  
 (a)  $\alpha + \beta - 1 = 0$  (b)  $6\alpha + \beta = 8$  (c)  $\alpha + 6\beta = 8$  (d)  $\alpha + \beta - 8 = 0$
20. 3 consecutive vertices of a llgm are  $(1, -2)$ ,  $(3, 6)$  &  $(5, 10)$ . The co-ordinate of 4<sup>th</sup> vertices are  
 (a)  $(-3, 2)$  (b)  $(2, -3)$  (c)  $(3, 2)$  (d)  $(-2, -3)$
21. The vertices of llgm are  $(3, -2)$ ,  $(4, 0)$ ,  $(6, -3)$  &  $(5, -5)$ . The diagonals intersect at M. The coordinate of M are :  
 (a)  $\left( \frac{9}{2}, \frac{-5}{2} \right)$  (b)  $\left( \frac{7}{2}, \frac{-5}{2} \right)$  (c)  $\left( \frac{7}{2}, \frac{-3}{2} \right)$  (d) None of these
22. The perimeter of the  $\Delta$  formed by points  $(0, 0)$ ,  $(1, 0)$  &  $(0, 1)$  is  
 (a)  $1 \pm \sqrt{2}$  (b)  $\sqrt{2} + 1$  (c) 3 (d)  $2 + \sqrt{2}$
23. The condition that the point  $(x, y)$  may lie on the line joining  $(3, 4)$  and  $(-5, -6)$  is  
 (a)  $5x + 4y + 1 = 0$  (b)  $5x - 4y + 1 = 0$  (c)  $5x - 4y - 1 = 0$  (d)  $5x + 4y - 1 = 0$
24. The points  $(-4, 0)$ ,  $(4, 0)$ ,  $(0, 3)$  are vertices of  
 (a) right triangle (b) isosceles triangle  
 (c) equilateral triangle (d) scalene triangle
25. The point which divides the line segment joining the points  $(7, -6)$ ,  $(3, 4)$  in ratio 1 : 2 internally  
 (a) I quadrant (b) II quadrant (c) III quadrant (d) IV quadrant
26. The perpendicular bisector of the line segment joining A $(1, 5)$  and B $(4, 6)$  cuts the y-axis at  
 (a)  $(0, 13)$  (b)  $(0, -13)$  (c)  $(0, 12)$  (d)  $(13, 0)$
27. The co-ordinate of the point which is equidistant from the 3 vertices of the  $\Delta AOB$  as shown in figure is

- (a)  $(x, y)$  (b)  $(y, x)$   
 (c)  $\left( \frac{x}{2}, \frac{y}{2} \right)$  (d)  $\left( \frac{y}{2}, \frac{x}{2} \right)$



28. A line intersects the y-axis and x-axis at the point P & Q. If  $(2, -5)$  is the midpoint of PQ, then coordinates of P & Q are  
 (a)  $(0, -5)$  &  $(2, 0)$  (b)  $(0, 10)$  &  $(-4, 0)$   
 (c)  $(0, 4)$  &  $(-10, 0)$  (d)  $(0, -10)$  &  $(4, 0)$
29. The area of  $\Delta$  with vertices  $(a, b + c)$ ,  $(b, c + a)$  &  $(c, a + b)$  is  
 (a)  $(a + b + c)^2$  (b) 0 (c)  $a + b + c$  (d)  $abc$
30. If the distance between the points  $(4, p)$  and  $(1, 0)$  is 5, then P is  
 (a) 4 only (b)  $\pm 4$  (c) -4 only (d) 0
31. If the points A $(1, 2)$ , O $(0, 0)$  and C $(a, b)$  are co-linear then  
 (a)  $a = b$  (b)  $a = 2b$  (c)  $2a = b$  (d)  $a = -b$
32. The area of a rhombus if its vertices are  $(3, 0)$ ,  $(4, 5)$ ,  $(-1, 4)$  and  $(-2, -1)$  taken in order is  
 (a) 24 sq. units (b) 12 sq. units (c) 35 sq units (d) 55 sq units

33. The area  $\Delta$  whose vertices are A(5, 2), B(4, 7), C(7, -4) is  
 (a) 5 sq units (b) 2 sq. units (c) 4 sq units (d) 0 sq. units
34. 2 vertices of  $\Delta ABC$  are A(-1, 4) and B(5, 2) & its centroid G(0, -3). The coordinates of C is  
 (a) (4, 6) (b) (6, 4) (c) (-15, -4) (d) (-4, -15)
35. If the points (a, 0), (0, b) and (1, 1) are collinear then  $\frac{1}{a} + \frac{1}{b} = ?$   
 (a) -1 (b) 0 (c) 1 (d) 2

### **SHORT ANSWERS (2 marks)**

- If A(0, 2) is equidistant from B(3, a) and C(a, 5). Find a
- Point A(a, 6) and B(2, 8) are equidistant from point C(1, 1). Find a.
- Find the value of x such that PQ = QR, where coordinates of P, Q & R are (6, -1), (1, 3) and (x, 8) respectively.
- (i) If A(3, 2) and B(-4, -5) are equidistant from P(x, y) then show that  $x + y + 2 = 0$ .  
 (ii) If the distances of P(x, y) from the points A(3, 6) & B(-3, 4) are equal, prove  $3x + y = 5$ .
- If the point (x, y) is equidistant from the points  $\{(a + b), (b - a)\}$  and  $(a - b, a + b)$ . Prove that  $bx = ay$ .
- Find the point on the x-axis which is equidistant from the points (7, 6) and (-3, 4)
- A point is equidistant from A(-6, 4) and B(2, -8). Find its coordinates if the abscissa and ordinate are equal.
- The distance between A(4, 2) and B(1, y) is 5. Find the value of y.
- A point P is at a distance of  $\sqrt{10}$  from the point (2, 3). Find the coordinates of the point P if its y coordinate is thrice of the x co-ordinate.
- Find the ordinates of the points whose abscissa is 2 & which are at a distance of  $3\sqrt{5}$  units from the point (5, 1).
- A is a point on the y-axis whose ordinate is 5 & B is a point whose coordinates are (-3, 1). Calculate AB.
- Distance between A(x, y) and B(-4, 7) is  $\sqrt{41}$ . Find x, y if it's a's ordinate is thrice of its abscissa.
- Using the distance formula show that the points (-1, -1), (2, 3) and (8, 11) are collinear.
- Find the centroid of the triangle whose vertices are (7, -8), (-9, 7), (8, 3).
- For what value of x are the points (7, x), (-5, 2) and (3, 6) collinear.

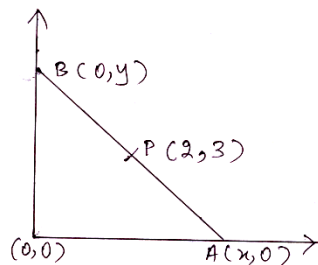
### **3 MARK QUESTION :**

- Find the area of a rhombus if its vertices are (3, 0), (4, 5), (-1, 4) and (-2, -1) taken in order.
- Two vertices of an isosceles triangle are (-2, 5) and (4, -1). Find the third vertex if the length of equal sides is  $3\sqrt{2}$  units.
- Prove that A(8, -10), B(7, -3) and C(0, -4) are the vertices of a right angled triangle.
- Show that the points (7, 10), (-2, 5) and (3, -4) are the vertices of an isosceles right triangle.
- Show that the points (0, 0),  $(3a, \sqrt{3}a)$  and  $(3a, -\sqrt{3}a)$  are the vertices of an equilateral triangle.
- Derive a relationship between a & b where P(13, 8), Q(a, b) and R(6, 0) are the vertices of right triangle with  $\angle R = 90^\circ$ .
- Show that A(3, 5), B(-1, 3), C(0, -1) & D(4, 1) form a parallelogram ABCD.
- Show that the points A(2, -2), B(14, 10), C(11, 13) & D(-1, 1) are the vertices of a rectangle.
- The 3 vertices of a rhombus taken in order are (3, 4), (-2, 3) and (-3, -2). What are the co-ordinates of the 4<sup>th</sup> vertex ?
- (i) Show that the points A(3, 5), B(1, 1), C(5, 3) and D(7, 7) are all the vertices of a rhombus.  
 (ii) Show that A(-3, 2), B(-5, -5), C(2, -3) and D(4, 4) are the vertices of a rhombus.
- Find the coordinates of the circumcentre of a triangle whose vertices are (3, 7), (0, 6) & (-1, 5). Find its circumradius.
- Find the radius of the circle whose centre is (0, 0) & which passes through (-6, 8)
- If (7, 1), (x, 9) and (-1, y) are 3 concyclic points whose centre is (3, 4). Find x & y.
- 3 consecutive vertices of a llgm ABCD are A(1, 2), B(1, 0) and C(4, 0). Find the 4<sup>th</sup> vertex D.

15. If  $(1, 2)$ ,  $(4, y)$ ,  $(x, 6)$  and  $(3, 5)$  are the vertices of a parallelogram taken in order. Find  $x$  &  $y$ .
16.  $P(5, a)$ ,  $Q(-4, 3)$  &  $R(b, -2)$  are the vertices of a  $\Delta PQR$ , whose centroid is the origin. Find  $a$  &  $b$ .
17. Find the value of  $P$  for which the points  $A(-5, 1)$ ,  $B(1, p)$  and  $C(4, -2)$  are collinear.
18. Find a relation between  $x$  &  $y$  if the points  $(x, y)$ ,  $(1, 2)$  and  $(7, 0)$  are collinear.
19. Find the values of  $k$  for which the points  $A(-5, 1)$ ,  $B(1, k)$  and  $C(4, -2)$  are collinear. Find the ratio in which  $B$  divides  $AC$ .
20. If the points  $A(x, y)$ ,  $B(5, 5)$  and  $C(10, 7)$  are collinear show that  $5y - 2x = 15$ .
21. (i) Find the coordinates of  $x, y$  such that the point  $P(x, y)$  lies on the line segment joining  $A(1, 4)$  &  $B(-3, 16)$   
(ii) If  $P(x, y)$  lies on the line segment joining the points  $(1, -3)$  and  $(-4, 2)$ , prove that  $x + y + 2 = 0$ .

### 4 MARK QUESTIONS

1. Find the co-ordinates of the points of trisection of the line segment joining the points  $(2, 3)$  &  $(6, 5)$
2.  $P$  is a point on the line segment joining  $A(4, 3)$  &  $B(-2, 6)$  such that  $5AP = 2BP$ . Find coordinates of  $P$ .
3. In what ratio does the point  $(3, a)$  divide the join of  $(1, 7)$  &  $(6, -3)$ ? Also find  $a$ .
4. Determine the ratio in which the straight line  $x - y = 0$  divides the segment joining  $A(3, -1)$  and  $B(8, 9)$
5. Determine the ratio in which the line  $3x + 4y - 9 = 0$  divides the line segment joining  $(1, 3)$  and  $(2, 7)$
6. Find the ratio in which the line joining the points  $(2, -6)$  and  $(8, 4)$  is divided by the  $x$ -axis. Find the co-ordinates of the point of division.
7. The midpoint of the line joining  $A(2, p)$  and  $B(q, 4)$  is  $(3, 5)$ . Calculate the values of  $p, q$ .
8. The coordinates of the point of the line joining points  $(3p, 4)$  &  $(-2, 2q)$  are  $(5, p)$ . Find  $p$  &  $q$ .
9. In the figure  $p(2, 3)$  is the midpoint of the line segment  $AB$ . Write the co-ordinates of  $AB$ .

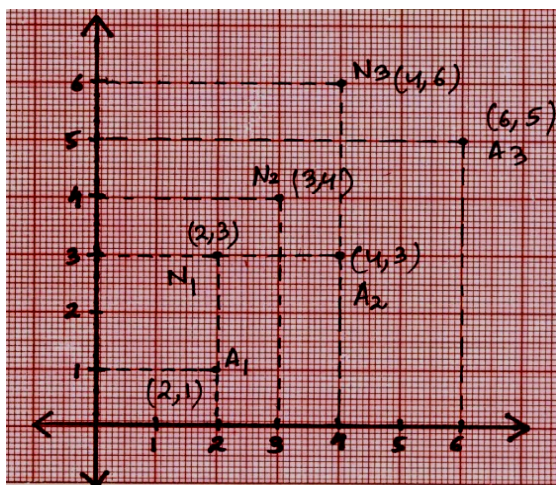


10. A line segment meets  $x$ -axis at  $A$  &  $y$ -axis at  $B$ . If the coordinates of the midpoint of  $AB$  are  $(3, 4)$ , find the co-ordinates of  $A$  &  $B$  and length of  $AB$ .
11.  $A$  &  $B$  are points  $(-2, -5)$  &  $(4, -3)$  respectively. Find the coordinates of point  $C$  on  $AB$  produced such that  $AC = 2BC$ .
12. The line segment joining the points  $(-3, 9)$  and  $(6, 3)$  is trisected. Find the coordinates of point of trisection.
13. The line segment joining the points  $(3, -4)$  &  $(1, 2)$  is trisected at  $P$  &  $Q$ . If coordinates of  $P$  &  $Q$  are  $(p, -2)$  and  $\left(\frac{5}{3}, q\right)$ . Find  $p$  &  $q$ .
14. The line segment joining the point  $(3, 2)$  and  $(6, 8)$  is divided into 4 equal parts. Find the coordinates of points of section.
15. Line segment  $PQ$  is divided into 5 equal parts at  $A, B, C, D$ . If  $A$  is  $(-3, -7)$  &  $C$  is  $(1, 1)$ . Find  $P, B, D, Q$ .
16. Show that the line segment joining  $(2, 5)$ ,  $(-8, 3)$  and  $(-3, 1)$ ,  $(-3, 7)$  bisect each other.
17.  $A(3, 3)$ ,  $B(6, -1)$  and  $D(-5, 9)$  are vertices of  $\square ABCD$ . Find the coordinates of vertex  $C$ .
18. If  $A(4, 4)$ ,  $B(0, 0)$  &  $C(6, 2)$  are the vertices of  $\Delta ABC$ , find the length of median through  $A$ .
19. Find the 3<sup>rd</sup> vertex of a triangle if its 2 vertices are  $(5, 3)$  and  $(7, -3)$  & midpoint of 1 side is  $(2, 2)$
20. Find the value of  $P$  for which the area formed by the triangle with vertices  $A(P, 2p)$ ,  $B(-2, 6)$  and  $C(3, 1)$  is 10 sq. units.
21. Find the area of the triangle formed by the joining of the midpoints of the sides of triangle whose vertices are  $(0, -1)$ ,  $(2, 1)$  and  $(0, 3)$ . Find the ratio of this area to the area of given triangle.

22. Find the area of quadrilateral ABCD formed by the points A(-2, -2), B(5, 1), C(2, 4) and D(-1, 5)
23. Find the area of the quadrilateral ABCD formed by the points A(2, 3), B(-4, -2), C(-3, -5) and D(3, -2) taken in order
24. Two vertices of a  $\Delta$  are (8, -6) and (-4, 6). The area of the triangle is 120 sq. units. Find the 3<sup>rd</sup> vertex, if it lies on  $x - 2y = 6$ .

**Value Based Questions.**

1. Aadya and Nitya planted some trees in a square garden as shown in the fig.1 both arguing that they have planted them in a straight line. Find out who is correct? Justify your decision. (N stands for Nitya and A stands of Aadya)
2. The students of class X of a school undertake to work for the campaign "Say no to plastic" in a city. They took the map of the city and form co-ordinate plane on it to divide their areas. Group A book the region covered between the co-ordinates (1, 1), (-3, 2), (-2,-2) and (1, -3) taken in order. Find the area of the region covered by group 4.
  - a) What are the harmful effects of using plastic?
  - b) How can you contribute in spreading awareness for such campaign?



(Figure – 1)