

CO-ORDINATE GEOMETRY

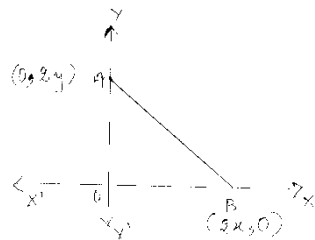
MCQ

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 3rd 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 ΔABC 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 3rd 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 (α, β) 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 4th 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 Δ 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 ΔAOB 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 Δ 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) ± 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 Δ 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 ΔABC 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.

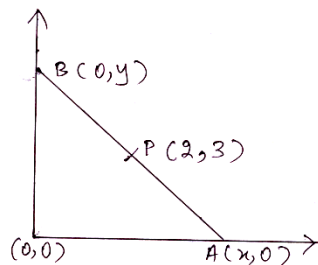
3 MARK QUESTION :

- 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 4th 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 4th 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 ΔPQR , 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 .

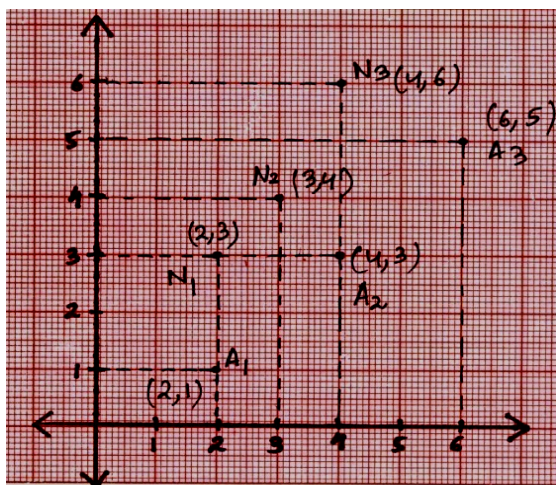


10. A line segment meets x -axis at A & y -axis at B . If the coordinates of the midpoint of AB are $(3, 4)$, find the co-ordinates of A & B and length of AB .
11. A & B are points $(-2, -5)$ & $(4, -3)$ respectively. Find the coordinates of point C on AB produced such that $AC = 2BC$.
12. The line segment 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 ΔABC , find the length of median through A .
19. Find the 3rd 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 Δ are (8, -6) and (-4, 6). The area of the triangle is 120 sq. units. Find the 3rd 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)