Coordinate Geometry

1 Mark

1. Write the value of k if the distance between $(k, 3)$ & $(4, 5)$ is $\sqrt{5}$.
2. Write the value of a & b if $(2, -3)$ is mid- point of the segment joining $(2, a)$ & $(b, -1)$.
3. Is the area of the triangle joining points $(1, 4), (2, 3)$ & $(-2, -11)$ zero?
4. $(5, 5), (3, 3)$ & $(-2, -11)$ are coordinates of the vertices of a triangle. Write the coordinate of centroid.
5. Which points are collinear: $A(4, -11), B(-4, 7), C(4, 5),$ $D(4, 0), E(-4, -3), F(0, 0)$
6. Point $A(3, -4)$ lie on a circle of radius 5cm with centre at origin. Write coordinates of other end of the diameter whose one end is A.
7. If $P(0, -2)$ & $Q(0, 3)$ are two points. Write the measure of PQ.
8. What is the relation between x and y if $(3, 5)$ & $(7, 1)$ are equidistance from $T(x, y)$.
9. Write the relation between the vertices of a triangle with zero area.
10. Is the point $(5, -7)$ lie on a circle whose centre is at origin and radius $5\sqrt{2}$ units?
11. A line is drawn through $P(4, 6)$ parallel to $x - axis$. What is the distance from the $x - axis$.
12. P is a point on the perpendicular bisector of AB. What is the relation between P, A & B.

2 Marks

13. Find the coordinates of a point on $y - axis$ equidistance from the points $(2, -2)$ & $(-4, 2)$.
14. PQ is a line segment where coordinates P & Q are $(-4, 5)$ & $(5, 2)$ respectively. Find coordinate of point R on PQ such that $PR = 2QR$.
15. DMN is an equilateral triangle with $D(0, 0)$ & $M(3, \sqrt{3})$. Find coordinate of N.
16. P is a point on $x - axis$ and $Q(-1, 5)$ is a point such that $PQ = 13$. Find coordinate of P.
17. Find the value of x if $PQ = PR$ and $P(0, 2), Q(3, x)$ & $R(x, 5)$ are three points.
18. Find the ratio in which the line segment joining $(5, -3)$ & $(-4, 6)$ is divided by $x - axis$.
19. Show that the mid -point of the line joining $(5, 7)$ & $(3, 9)$ is also the mid- point of the line joining $(8, 6)$ & $(0, 10)$.
20. In what ratio does the point $\left(\frac{1}{2}, 6\right)$ divide the line segment joining the points $(3, 5), (-7, 9)$.
21. Find the coordinate of point a R such that $\frac{PR}{RQ} = \frac{3}{4}$ where the coordinates of P are $(-2, 1)$ and that of Q are $(3, -2)$.
22. One end of a diameter of circle is at $(0, 3)$ and centre is $(-1, 5)$. Find the coordinates of the other end of this diameter.
23. Find the value of x if $P(x, x)$ is equidistant from $A(-1, 2)$ & $B(-2, 1)$.
24. Find the area of ΔABC whose vertices are $A(-1, 2), B(-1, -2)$ & $C(2, 1)$.
25. If $(-1, 3), (1, -1)$ & $(5, 1)$ are the vertices of a triangle. Find the length of median through first vertices.

26. Find the coordinates of point Q, R & S on PT such that $PQ : QR : RS : ST = 1 : 1 : 1 : 1$ and coordinates of P & T are $(-3, -2)$ & $(1, 4)$ respectively.

3 Marks

27. Find the value of y such that $ar(\Delta LMN) = 12$ & coordinates of the vertices are $L(1, 2), M(3, y)$ & $N(5, 2)$.

28. The three coordinates of a parallelogram $PQRS$ are $P(-3, 1), Q(1, 1)$ & $(3, 3)$ find the coordinates of S.

29. If $A(-3, 2), B(x, y)$ & $C(1, 4)$ are vertices of an isosceles triangle with $AB = BC$. Show that $2x + y = 1$.

30. Prove that the figure obtained on joining the mid -points of parallelogram $PQRS$ is a rectangle where $P(1, 0), Q(5, 3), R(2, 7)$ & $S(-2, 4)$.

31. Find the length of perpendicular from $X(0, 6)$ on YZ, where coordinates of Y & Z are $(-5, -3)$ & $(-11, 3)$.

32. Find the coordinates of the circumcentre of the triangle whose vertices are $(0, 0), (8, 0)$ & $(0, 6)$. Also find the circumradius.

33. If the point $(6, 4)$ divides the line segment joining $L(8, 5)$ & $M(a, b)$ in the ratio $2 : 5$. Find the values of a & b and also find the coordinates of the mid -point of LM.

34. If the coordinates of two adjacent vertices of a parallelogram are $(3, 2)$ & $(-1, 0)$ and diagonals cut each other at $(2, -5)$. Find the coordinates of other two vertices of the parallelogram.

35. In what ratio, the line joining $(1, 3)$ & $(2, 7)$ is divided by $3x + y = 9$.

36. The joining of $D(-4, 0)$ & $E(0, 6)$ is divided by $D_1(p, 2)$ & $E_1\left(-\frac{4}{3}, q\right)$ in three equal parts. Find the values of p and q.

37. For what value of c the centroid of a triangle with vertices $P(1, a), Q(2, f)$ & $R(c^2, -3)$ lie on $y - axis$.

38. If the vertex P of a ΔPQR is $(-1, 2)$ and mid points of PQ & PR are $(-1, 0)$ & $\left(\frac{1}{2}, \frac{3}{2}\right)$. Find the coordinates of Q and R.

39. Length of a line segment is $\sqrt{34}$ units. If one end is at $(4, 2)$ and ordinate of second end is 5. Show that abscissa is either -1 or 9.

40. $(6, -10), (-8, 14)$ & $(-4, -2)$ are the coordinates of mid- points of a triangle. Find the coordinates of the vertices of the triangle.

41. If $P(p, q)$ is equidistant from the points $A(a + b, b - a)$ & $B(a - b, a + b)$. Prove that $bp = aq$.

42. $P(-2, 2), Q(q, 8), R(6, r)$ are the coordinate of three concyclic points whose centre is at $(2, 5)$. Find the possible values of q & r.

43. If area of quadrilateral $PQRS$ is zero, where $P(1, -2), Q(-5, 6), R(7, -4)$ & $S(h, -2)$ are vertices, show that $h = 5$.

44. If coordinates of vertices of the quadrilateral are $L(6, 3), M(-3, 5), N(4, -2)$ & $P(x, 3x)$. Find the value of x if $ar(\Delta LMN) = 2ar(\Delta PMN)$.

45. $P(-1, 5), Q(3, 1)$ & $R(5, 7)$ are coordinates of vertices of ΔPQR with area 16 square units. S, T and U are the mid points of QR, RP & PQ. Find the ratio $\frac{ar(\Delta PQR)}{ar(\Delta STU)}$

Answers

1. $k = 3, 5$
2. $a = -5, b = 2$
3. 9 $sq. units$
4. $(2, -1)$
5. A, C, D
6. $(-3, 4)$
7. 5 $units$
8. $x - y = 2$

9. *vertices will be collinear*
10. No
11. $6\ units$
12. $PA = PB$
13. $\left(0, \frac{3}{2}\right)$
14. $(2, 3)$
15. $\left(0, 2\sqrt{3}\right)\ or\ \left(3, -\sqrt{3}\right)$
16. $(11, 0)\ or\ (-13, 0)$
17. $x = 1$
18. $k = \frac{5}{4}$
20. $k = \frac{1}{3}$
21. $\left(\frac{1}{7}, -\frac{2}{7}\right)$
22. $(-2, 7)$
23. $(0, 0)$
24. $6\ units$
25. $5\ units$
26. $Q\left(-2, \frac{-1}{2}\right), R(-1, 1), S\left(0, \frac{5}{2}\right)$
27. $y = 4$

28. $(-1, 3)$
31. $10\ units$
32. $r = 5, centre\ (4, 3)$
33. $Mid-point\ of\ LM \left(\frac{9}{2}, \frac{13}{4}\right)$
34. $C(1, -12), D(5, -10)$
35. $k = \frac{3}{4}$
36. $p = -\frac{8}{3}, q = 4$
37. $c = \sqrt{3}$
38. $Q(-1, -2), R(2, 1)$
40. $(10, -26), (2, 6), (-18, 22)$
42. $q = 6\ or\ -2\ \&\ r = 8, 2$
44. $x = \frac{11}{8}$
45. $4: 1$

$\mathcal{B}y$ **Arun Kumar Shukla**