



PRACTICE WORKSHEET

Subject: Mathematics

Class: ICSE 10th

Chapter: Section Formula

Worksheet: M-11

TYPE/TOPIC OF QUESTIONS: SECTION FORMULA AND MID-POINT FORMULA

1. Find the coordinates of the points which divides the join of P (-1, 7) and Q (4, -3) in the ratio 2 : 3.
2. Find the point of bisection of the line segment AB, where A (-6, 11) and B (10, -3)
3. Find the coordinates of the points which divides the join of X (-1, 7) and Y (4, -3) in the ratio 7 : 2.
4. Find the point of trisection of the line segment AB, where A (-6, 11) and B (10, -3).
5. Find the coordinates of points of trisection of the line segment joining the point (6, -9) and the origin.
6. If X, Y and Z divides the line segment PQ in four equal parts such that $PX = XY = YZ = ZQ$, and the coordinates of P and Q are (1, 6) and (3, -4) respectively then find the coordinates of X, Y and Z.
7. In what ratio is the line segment joining X (0, 3) and Y (4, -1) divided by the x-axis. Write the coordinates of the point where XY intersects the x-axis.
8. If the point (p, q) is the middle point of the line segment joining the points P (7, -4) and Q (-1, 2) then find p and q.
9. Let M (-3, 5) be the middle point of the line segment XY whose one end has the coordinates (0, 0). Find the coordinates of the other end.
10. In what ratio is the line segment joining X (2, -3) and Y (5, 6) divides by the x-axis? Also, find the coordinates of the point of division.
11. The coordinates of the midpoint of the line segment AB are (1, -2). The coordinate of A are (-3, 2). Find the coordinate of B.
12. Find the ratio in which the line segment PQ, where P (-5, 2) and Q (2, 3), is divided by the y-axis.
13. Find the ratio in which the point X (-6, h) divides the join of P (-4, 4) and Q (6, -1) and here hence find the value of h.
14. Find the ratio in which the line segment PQ, where P (4, -2) and Q (1, 3), is divided by the x-axis.

TYPE/TOPIC OF QUESTIONS: COLLINEARITY OF THREE POINTS

15. Prove that the points (4, -5) and (1, 1) and (-2, 7) are collinear.
16. Show that the following points are collinear:
 - (i) P(1, 1), Q(-2, 7) and R(3, -3)
 - (ii) P(2, 0), Q(11, 6) and R(-4, -4)
17. Prove that the points (a, b + c) and (b, c + a) and (c, a + b) are collinear, where $a > b > c$.
18. Using the distance formula show that the points A(6, 9), B(0, 1) and C(-6, -7) are collinear.
19. For what value of k, the points (k, -2), (1, 4) and (-3, 16) in given order are collinear?
20. Show that the points A(-1, -1), B(2, 3) and C(8, 11) are collinear.
21. Prove the points (2, 3), (-4, -6) and (1, 3/2) cannot be the three vertices of a triangle.
22. By distance formula, show that the points (1, -1), (5, 2) and (9, 5) are collinear.

TYPE/TOPIC OF QUESTIONS: FINDING CENTROID OF A TRIANGLE

23. Calculate the co-ordinates of the centroid of the triangle ABC, if $A = (7, -2)$, $B = (0, 1)$ and $C = (-1, 4)$.
24. Find the centroid of the triangle PQR whose vertices are $P(-1, 0)$, $Q(5, -2)$ and $R(8, 2)$.
25. Let the vertices of a triangle be $A(1, 2)$, $B(-2, -5)$ and $C(2, 1)$. Find its centroid and the length of the median through C.
26. The centroid of a triangle ABC is $(1, 1)$. Two of the vertices are $A(3, -4)$, $B(-4, 7)$. Find the coordinates of the third vertex.
27. Find the co-ordinates of the centroid of a triangle PQR whose vertices are $P(6, -2)$, $Q(4, -3)$ and $R(-1, -4)$.
28. Two vertices of a triangle are $(1, 3)$ and $(2, -4)$. If the origin is the centroid of the triangle, find the third vertex.
29. If $G(-2, 1)$ is the centroid of a triangle PQR and two of its vertices are $P(1, 6)$ and $Q(-5, 2)$, find the third vertex of the triangle.
30. In the triangle ABC, AD is a median. If $A(5, -3)$ and $D(1, 9)$ then find the centroid of the triangle ABC.
31. Find the third vertices of a triangle PQR if two of its vertices are $Q(-3, 1)$ and $R(0, -2)$, and its centroid is at the origin.
32. $P(3, 2)$ and $Q(-2, 1)$ are the two vertices of the triangle PQR, whose centroid is $G(5/3, -1/3)$. Find the co-ordinates of the third vertex R.
33. Let the vertices of a triangle be $(-4, 1)$, $(3, -4)$ and $(1, 3)$. Prove that its centroid is in the origin.
34. The co-ordinates of the centroid of a triangle PQR are $(2, -5)$. If $Q = (-6, 5)$ and $R = (11, 8)$; calculate the co-ordinates of the vertex P.

TYPE/TOPIC OF QUESTIONS: DISTANCE FORMULA* (Not to be solved)

***This topic is excluded from ICSE 2019 Portion, although it forms a part of the Chapter – Section Formula. Students are not required to solve this exercise in workbook. Use this exercise only as a reference.**

35. Find the point on the x-axis which is equidistant from the point $(5, 4)$ and $(-2, 3)$.
36. Find the point on the y-axis whose distances from $(3, 2)$ and $(-1, 3)$ and $(-1, 3/2)$ are in the ratio $2 : 1$.
37. If the distance of the point (a, b) from $(-3, 0)$ are 4 each, find a and b .
38. Find a if the distance of the point $(4, 1)$ from the point $(3, a)$ is $\sqrt{10}$.
39. The point B has the coordinates $(0, -4)$. Find the coordinates of the point A on the x-axis if the distance between A and B is 5 units.
40. Find points on the x-axis, each of which is at a distance of 10 units from the point $P(11, -8)$.
41. Find the point on the y-axis which is equidistant from the points $A(-4, 3)$ and $B(5, 2)$.
42. If the point $A(a, 2)$ is equidistant from the points $B(8, -2)$ and $C(2, -2)$, find the value of a .
43. Find the ordinate (y coordinate) of a point whose abscissa (x coordinate) is 10 and which is at a distance of 10 units from the point $P(2, -3)$.
44. Find all possible values of a for which the distance between the points $A(a, -1)$ and $B(5, 3)$ is 5 units.