



Attempt questions first; check the separate key afterward. Show steps and draw labelled diagrams where asked.

A. Very short answers - 1 mark each

1. Write the distance formula between two points.
2. Find distance between $(0, 0), (3, 4)$.
3. Find midpoint of $(2, 4), (6, 8)$.
4. Find distance of $(-3, 4)$ from origin.
5. Which axis contains $(0, -5)$?
6. Can distance between distinct points be zero?
7. Find midpoint of $(-2, 3), (2, -3)$.
8. State the internal section formula for ratio $m:n$.

B. Short answers / practice - 2 marks each

9. Find distance between $(1, 2), (7, 10)$.
10. Find point dividing $(0, 0), (6, 9)$ in ratio $1:2$.
11. Find point dividing $(2, -1), (8, 5)$ in ratio $2:1$.
12. Find x if distance between $(x, 0), (0, 3)$ is 5 .
13. Show $(0, 0), (3, 0), (3, 4)$ form a right triangle.
14. Find midpoint of endpoints of a diameter $(-4, 2), (6, 8)$.
15. Find radius for the preceding diameter.
16. Find x for which $(2, 3)$ and $(x, 7)$ are 5 units apart.
17. Find point on x -axis equidistant from $(2, 3), (4, 5)$.
18. Find ratio in which $(3, 4)$ divides $(1, 2), (7, 8)$.
19. Are $(1, 1), (2, 2), (4, 4)$ collinear? Verify with distances.
20. Find fourth vertex of a parallelogram with consecutive $A(0, 0), B(4, 0), C(5, 3)$.

C. Application / reasoning - 3 marks each

21. Show that $(1, 0), (0, 1), (-1, 0), (0, -1)$ form a square.

22. Find points trisecting the segment $(-3, 0)$ to $(6, 9)$.
23. Find ratio in which y -axis divides $(-2, 3), (4, 9)$.
24. Find point on y -axis equidistant from $(4, 2), (2, 6)$.
25. Find all x if $(0, 0), (x, 0), (x, 4)$ make a triangle with hypotenuse 5 .
26. Explain why midpoint is a special case of the section formula.
27. Find distance between $(-2, -3)$ and $(4, 5)$.
28. Find the point dividing $(-1, 2)$ and $(9, 7)$ internally in ratio $2:3$.
29. The midpoint of AB is $(3, -1)$, and $A = (-2, 5)$. Find B .
30. Find y if $(1, y)$ is equidistant from $(-1, 2)$ and $(3, 6)$.

31. Show that $(0, 0), (4, 0), (2, 2\sqrt{3})$ form an equilateral triangle; find its perimeter.

D. Extended practice - 5 marks each

32. Derive the distance formula using a right triangle.
33. Derive the internal section formula and verify it for ratio $1:1$.
34. Show that $(0, 0), (6, 0), (6, 8), (0, 8)$ form a rectangle and find both diagonals.
35. Find centre and radius of the circle with diameter joining $(-2, -1), (4, 7)$.

ANSWER KEY - Numerical / closed questions

- 2) 5. 3) $(4, 6)$. 4) 5. 5) y -axis. 6) No. 7) $(0, 0)$. 9) 10. 10) $(2, 3)$. 11) $(6, 3)$. 12) $x = \pm 4$. 14) Centre $(1, 5)$. 15) $\sqrt{34}$. 16) $x = -1$ or 5 . 17) $(7, 0)$. 18) $1:2$. 19) Yes. 20) $D(1, 3)$. 22) $(0, 3), (3, 6)$. 23) $1:2$; point $(0, 5)$. 24) $(0, 5/2)$. 25) $x = \pm 3$. 27) 10. 28) $(3, 4)$. 29) $(8, -7)$. 30) $y = 4$. 31) Side 4; perimeter 12. 34) Each 10. 35) Centre $(1, 3)$; radius 5.