

Coordinate Geometry Problems

1. Find the distance between the points $(3, 4)$ and $(7, 1)$.
2. Determine the midpoint of the line segment joining $(2, 3)$ and $(6, 7)$.
3. Find the point that divides the line segment joining $(4, 2)$ and $(8, 6)$ in the ratio $3 : 1$.
4. Calculate the area of a triangle with vertices $(1, 2)$, $(4, 5)$, and $(6, 2)$.
5. Prove that the points $(0, 0)$, $(4, 0)$, and $(2, 3)$ form a triangle.
6. Show that the points $(1, 2)$, $(3, 4)$, and $(5, 6)$ are collinear.
7. Find the centroid of a triangle with vertices $(1, 2)$, $(3, 4)$, and $(5, 6)$.
8. Determine the equation of a line passing through $(2, 3)$ and $(6, 7)$.
9. Calculate the slope of the line passing through $(5, 8)$ and $(3, 2)$.
10. Find the length of the diagonal of a rectangle with opposite corners at $(2, 3)$ and $(8, 7)$.
11. Determine the equation of a line parallel to $y = 3x + 5$ and passing through $(2, 3)$.
12. Find the equation of a line perpendicular to $y = -2x + 1$ and passing through $(4, 5)$.
13. Calculate the coordinates of the reflection of $(3, 4)$ across the x-axis.
14. Find the coordinates of the reflection of $(5, 7)$ across the line $y = x$.

15. Determine whether the triangle with vertices $(1, 1)$, $(4, 5)$, and $(6, 3)$ is a right triangle.
16. Find the equation of the line passing through the origin and perpendicular to $y = \frac{1}{2}x - 3$.
17. Calculate the area of a parallelogram with vertices $(1, 1)$, $(4, 1)$, $(6, 3)$, and $(3, 3)$.
18. Show that the quadrilateral with vertices $(1, 1)$, $(4, 1)$, $(6, 3)$, and $(3, 3)$ is a parallelogram.
19. Determine the equation of the line passing through $(3, 4)$ and having a slope of 5.
20. Find the distance of the point $(3, 4)$ from the line $2x + 3y - 6 = 0$.
21. Prove that the points $(2, 3)$, $(4, 7)$, and $(6, 11)$ lie on the same straight line.
22. Find the circumcenter of a triangle with vertices $(1, 2)$, $(3, 4)$, and $(5, 6)$.
23. Calculate the coordinates of the orthocenter of a triangle with vertices $(0, 0)$, $(4, 0)$, and $(2, 3)$.
24. Show that the line joining $(1, 2)$ and $(3, 4)$ is perpendicular to the line joining $(5, 6)$ and $(7, 8)$.
25. Find the coordinates of a point that is equidistant from $(1, 2)$ and $(3, 4)$.
26. Prove that the quadrilateral formed by the points $(1, 1)$, $(4, 1)$, $(4, 4)$, and $(1, 4)$ is a square.
27. Determine the coordinates of the midpoint of a line segment with endpoints $(1, 1)$ and $(5, 5)$.

28. Find the slope of the line passing through $(2, 3)$ and $(4, 7)$.
29. Prove that the line $y = 3x + 5$ is parallel to the line $y = 3x - 2$.
30. Show that the line $y = -\frac{1}{2}x + 1$ is perpendicular to the line $y = 2x - 3$.
31. Determine the coordinates of the point of intersection of the lines $y = 3x + 5$ and $y = -x + 1$.
32. Calculate the area of a triangle formed by the points $(0, 0)$, $(4, 0)$, and $(2, 3)$.
33. Find the equation of the perpendicular bisector of the line segment joining $(2, 3)$ and $(4, 5)$.
34. Determine the slope of the line passing through $(1, 2)$ and $(3, 6)$.
35. Prove that the points $(1, 1)$, $(3, 3)$, and $(5, 5)$ are collinear.
36. Calculate the equation of the line passing through $(4, 5)$ and parallel to $y = -2x + 3$.
37. Determine the coordinates of the centroid of a triangle with vertices $(1, 2)$, $(4, 5)$, and $(6, 3)$.
38. Find the equation of the line perpendicular to $y = x - 1$ and passing through $(3, 4)$.
39. Show that the quadrilateral with vertices $(0, 0)$, $(4, 0)$, $(4, 4)$, and $(0, 4)$ is a rectangle.
40. Prove that the points $(1, 2)$, $(3, 4)$, and $(5, 6)$ are collinear.
41. Determine the length of the line segment joining $(3, 4)$ and $(7, 8)$.

42. Find the midpoint of the line segment joining $(2, 3)$ and $(8, 9)$.
43. Calculate the coordinates of the reflection of $(3, 4)$ across the y -axis.
44. Determine the equation of a line passing through $(5, 7)$ and having a slope of -3 .
45. Prove that the points $(2, 3)$, $(4, 7)$, and $(6, 11)$ lie on a straight line.
46. Find the area of a parallelogram with vertices $(1, 1)$, $(4, 1)$, $(6, 3)$, and $(3, 3)$.
47. Determine the coordinates of a point dividing the line segment joining $(1, 2)$ and $(5, 6)$ in the ratio $1 : 3$.
48. Show that the line joining $(1, 2)$ and $(3, 4)$ is parallel to the line joining $(5, 6)$ and $(7, 8)$.
49. Calculate the distance from the point $(3, 4)$ to the line $x + y - 5 = 0$.
50. Prove that the quadrilateral with vertices $(0, 0)$, $(4, 0)$, $(4, 4)$, and $(0, 4)$ is a square.