

**Class X**  
**MATHEMATICS**

1. Find the value of  $k$ , if the distance between the point  $(k, -1)$  and  $(3, 2)$  is 5.
2. What point (or points) on the X-axis are at a distance of 5 units from the point  $(5, -4)$ ?
3. Show that four points  $(0, -1)$ ,  $(6, 7)$ ,  $(-2, 3)$  and  $(8, 3)$  are the vertices of a rectangle.
4. Show that the points  $(0, -2)$ ,  $(3, 1)$ ,  $(0, 4)$  and  $(-3, 1)$  are the vertices of a square. Also find the area of the square.
5. Find the centre of the circle passing through the points  $(5, 7)$ ,  $(6, 6)$  and  $(2, -2)$ . Also, find its radius.
6. Show that the point:
  - (i)  $(1, -1)$ ,  $(-1/2, 1/2)$  and  $(1, 2)$  are the vertices of an isosceles triangle.
  - (ii)  $(0, 0)$ ,  $(5, 5)$  and  $(-5, 5)$  are the vertices of a right isosceles triangle.
  - (iii)  $(-2, 2)$ ,  $(8, -2)$ ,  $(-4, -3)$  are the vertices of right-angle. Find the point at which it is right-angled
  - (iv)  $(1, 1)$ ,  $(-1, -1)$ ,  $(-\sqrt{3}, \sqrt{3})$  are vertices of an equilateral triangle.
7. The vertices of a triangle are  $(-2, 0)$ ,  $(2, 3)$  and  $(1, -3)$ . Is the triangle equilateral, isosceles or scalene?
8. Show that the points:
  - (i)  $(2, 1)$ ,  $(5, 4)$ ,  $(4, 7)$ ,  $(1, 4)$  are the angular points of a parallelogram.
  - (ii)  $(7, 3)$ ,  $(3, 0)$ ,  $(0, -4)$ ,  $(4, -1)$  are the vertices of a rhombus.
  - (iii)  $(0, -1)$ ,  $(-2, 3)$ ,  $(6, 7)$ ,  $(8, 3)$  are the vertices of a rectangle
  - (iv)  $(0, -2)$ ,  $(3, 1)$ ,  $(0, 4)$ ,  $(-3, 1)$  are the vertices of a square
  - (v)  $(1, 2)$ ,  $(5, 4)$ ,  $(3, 8)$ ,  $(-1, 6)$  are the angular points of a square.
9. The centre of a circle is  $(2k - 1, 3k + 1)$  and it passes through the point  $(-3, -1)$ . Find the value (or values) of  $k$  if a diameter of the circle is of length 20 units.
10. If  $(0, 0)$ ,  $(3, 0)$  and  $(x, y)$  are the vertices of an equilateral triangle, find  $x$  and  $y$ .
11. Find the co-ordinate of the points of trisection of the line segment joining the points  $A(-4, 3)$  and  $B(2, -1)$ .
12. Calculate the ratio in which the line joining  $A(6, 5)$  and  $B(4, -3)$  is divided by the line  $y = 2$ .

13. If  $(2, 1)$ ,  $(4, 5)$ ,  $(-1, -3)$  are the mid-points of the sides of a triangle, find the co-ordinates of its vertices.
14. Three consecutive vertices of a parallelogram ABCD are  $A(10, -6)$ ,  $B(2, -6)$ , and  $C(-4, -2)$ , find the fourth vertex D.
15. The centre of circle is  $C(-1, 6)$  and one end of a diameter is  $A(5, 9)$ , find the co-ordinates of the other end.
16. Find the co-ordinates of the mid-points of the line-segments joining the following pairs of points:  
(i)  $(2, -3)$ ,  $(-6, 7)$       (ii)  $(5, -11)$ ,  $(4, 3)$       (iii)  $(a + 3, 5b)$ ,  $(2a - 1, 3b + 4)$
17. (i) The co-ordinates of A and B are  $(-3, a)$  and  $(1, a + 4)$ . The mid-point of AB is  $(-1, 1)$ . Find the value of a.  
  
(ii) Find the distance of  $(1, 2)$  from the mid-point of the line-segment joining  $(6, 8)$  and  $(2, 4)$ .
18. Prove that the points  $(1, -1)$ ,  $(-\frac{1}{2}, \frac{1}{2})$  and  $(1, 2)$  are the vertices of an isosceles triangle.
19. Find a point on the x-axis which is equidistant from the points  $(5, 4)$  and  $(-2, 3)$
20. The vertices of a triangle are  $(-2, 0)$ ,  $(2, 3)$  and  $(1, -3)$ . Is the triangle equilateral, isosceles or scalene?
21. The length of a line-segment is 10. If one end is at  $(2, -3)$  and the abscissa of the second end is 10, show that its ordinate is either 3 or  $-9$ .
22. If the distance of  $P(x, y)$  from  $A(5, 1)$  and  $B(-1, 5)$  are equal, prove that  $3x = 2y$ .
23. Find the point on x-axis which is equidistant from  $(-2, 5)$  and  $(2, -3)$ .
24. Find the point on the y-axis which is equidistant from  $(-5, -2)$  and  $(3, 2)$
25. Find the value of k, if the point  $P(0, 2)$  is equidistant from  $(3, k)$  and  $(k, 5)$ .
26. The coordinates of the centroid of a triangle are  $(1, 3)$  and two its vertices are  $(-7, 6)$  and  $(8, 5)$ . Find the third vertex of the triangle.
28. Find the coordinates of point R which divides the line-segment joining the point  $P(-2, 3)$  and  $Q(4, 7)$  internally in the ratio  $4 / 7$ .
29. If A and B are  $(1, 4)$  and  $(5, 2)$  respectively, find the coordinates of P when  $AP / PB = 3 / 4$ .

30. Find the coordinates of a point which divides internally the line-segment joining the points  $(-3, -4)$  and  $(-8, 7)$  in the ratio  $7 : 5$ .
31. Find the ratio in which the line-segment joining the points  $(6, 4)$  and  $(1, -7)$  is divided internally by the axis of  $x$ .
32. Find the distance of the point  $(1, 2)$  from the mid-point of the line-segment joining the points  $(6, 8)$  and  $(2, 4)$ .
33. Find the length of the medians of the triangle whose vertices are  $(1, -1)$ ,  $(0, 4)$  and  $(-5, 6)$ .
34. Show that the mid-point of the line-segment joining the points  $(5, 7)$  and  $(3, 9)$  is also the mid-point of the line-segment joining the points  $(8, 6)$  and  $(-2, 10)$ .
35. Find the coordinates of the points which divide the line-segment joining the points  $(-4, 0)$  and  $(0, 6)$  in four equal parts.
36. Find the centroid of the triangle whose vertices are  $(4, -8)$ ,  $(-9, 7)$ ,  $(8, 13)$ .
37. Prove that the diagonals of a rectangle bisect each other and are equal.
38. Show that the points  $A(1, 0)$ ,  $B(5, 3)$ ,  $C(2, 7)$  and  $D(-2, 4)$  are the vertices of a parallelogram.