CBSE

COORDINATE GEOMETRY WS 1

Class 10 - Mathematics

Section A

1. The coordinates of the third vertex of an equilateral triangle whose two vertices are at (3, 4), (-2, 3), are **[1]** _____.

   a) (1, 7)

   b) (5, 1)

   c) (-5, 5)

   d) $\left(\frac{1+\sqrt{3}}{2}, \frac{7-5\sqrt{3}}{2} \right)$ or $\left(\frac{1-\sqrt{3}}{2}, \frac{7+5\sqrt{3}}{2} \right)$

2. If points A(5, p), B(1, 5), C(2, 1) and D(6, 2) form a square ABCD, then p = **[1]**

   a) 3

   b) 8

   c) 7

   d) 6

3. The distance between the points (0, 0) and (a - b, a + b) is **[1]**

   a) $2\sqrt{ab}$

   b) $\sqrt{2a^2 + 2b^2}$

   c) $2\sqrt{a^2 + b^2}$

   d) $\sqrt{2a^2 + ab}$

4. Points (6, 8), (3, 7), (-2, -2) and (1, -1) are joined to form a quadrilateral. What will be the structure of the **[1]** quadrilateral?

   a) Rectangle

   b) Rhombus

   c) Square

   d) Parallelogram

5. The distance between the lines 2x + 4 = 0 and x - 5 = 0, is **[1]**

   a) 9 units

   b) 5 units

   c) 1 unit

   d) 7 units

6. The distance between the points P $\left(-\frac{11}{3}, 5 \right)$ and Q $\left(-\frac{2}{3}, 5 \right)$ is: **[1]**

   a) 6 units

   b) 2 units

   c) 3 units

   d) 4 units

7. (0, 3), (4, 0) and (− 4, 0) are the vertices of **[1]**

   a) a right triangle

   b) an isosceles triangle

   c) a scalene triangle

   d) an equilateral triangle

8. Distance of point P(4, - 3) from origin is: **[1]**

   a) ± 5 units

   b) 5 units

   c) 4 units

   d) 3 units

9. If the points (2, 3), (4, k) and (6, -3) are collinear, then the value of k is **[1]**

   a) 4

   b) 1

c) 0 d) 3

10. The distance of the point (-1, 7) from x-axis is: **[1]**

 a) 7 b) 6

 c) -1 d) $\sqrt{50}$

11. The distance of the point P(-6, 8) from origin is: **[1]**

 a) -6 b) 8

 c) 6 d) 10

12. If the coordinates of a point are (3, -7), then its ordinate is **[1]**

 a) 7 b) -3

 c) -7 d) 3

13. The distance of a point from the x-axis is called **[1]**

 a) due point b) origin

 c) abscissa d) ordinate

14. **Assertion (A):** If the points A(4, 3) and B(x, 5) lie on a circle with centre O(2, 3), then the value of x is 2. **[1]**
 Reason (R): Centre of a circle is the mid-point of each chord of the circle.

 a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A.

 c) A is true but R is false. d) A is false but R is true.

15. **Assertion (A):** Point A is on the y-axis at a distance of 4 units from the origin. If the coordinates of the point B are (-3, 0), then the length of AB is 5 units. **[1]**

 Reason (R): Distance between points A(x_1, y_1) and B(x_2, y_2) is $\sqrt{\left(x_2 - x_1\right)^2 + \left(y_2 - y_1\right)^2}$.

 a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A.

 c) A is true but R is false. d) A is false but R is true.

16. **Assertion (A):** The point (0,-3) lies on the y-axis. **[1]**
 Reason (R): The x - coordinate of the point on y-axis is zero.

 a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A.

 c) A is true but R is false. d) A is false but R is true.

17. **Assertion (A):** Image of point (–5, 0) is (5, 0). **[1]**
 Reason (R): Image of point (a, 0) is (–a, 0).

 a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A.

 c) A is true but R is false. d) A is false but R is true.

18. **Assertion (A):** The value of y is 6, for which the distance between the points P(2, -3) and Q(10, y) is 10. **[1]**
 Reason (R): Distance between two given points A(x_1, y_1) and B(x_2, y_2) is given 6

$$AB = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

    a) Both A and R are true and R is the correct explanation of A.

    b) Both A and R are true but R is not the correct explanation of A.

    c) A is true but R is false.

    d) A is false but R is true.

19. **Assertion (A):** Point P(0, 2) is the point of intersection of y-axis with the line 3x + 2y = 4. **[1]**

Reason (R): The distance of point P(0, 2) from x-axis is 2 units.

    a) Both A and R are true and R is the correct explanation of A.

    b) Both A and R are true but R is not the correct explanation of A.

    c) A is true but R is false.

    d) A is false but R is true.

20. **Assertion (A):** Distance of (–4, 3) from x-axis is 5 units. **[1]**

Reason (R): Distance of point (a, b) from x-axis is |b| (mod b) units.

    a) Both A and R are true and R is the correct explanation of A.

    b) Both A and R are true but R is not the correct explanation of A.

    c) A is true but R is false.

    d) A is false but R is true.

21. **Assertion (A):** Distance of (5, 12) from y-axis is 5 units. **[1]**

Reason (R): Distance of point (h, k) from y-axis is always k units.

    a) Both A and R are true and R is the correct explanation of A.

    b) Both A and R are true but R is not the correct explanation of A.

    c) A is true but R is false.

    d) A is false but R is true.

22. **Assertion (A):** The points (k, 2 - 2k), (-k +1, 2k) and (-4 - k, 6 - 2k) are collinear if k = $\frac{1}{2}$ **[1]**

Reason (R): Three points A, B and C are collinear in the same straight line if AB + BC = AC

    a) Both A and R are true and R is the correct explanation of A.

    b) Both A and R are true but R is not the correct explanation of A.

    c) A is true but R is false.

    d) A is false but R is true.

23. **Assertion (A):** The point (0, 4) lies on y-axis. **[1]**

Reason (R): The x coordinate on the point on y-axis is zero.

    a) Both A and R are true and R is the correct explanation of A.

    b) Both A and R are true but R is not the correct explanation of A.

    c) A is true but R is false.

    d) A is false but R is true.

24. **Assertion (A):** Point (0, 3) has image (0, –3). **[1]**

Reason (R): Image of (0, k) is (0, –k) only.

    a) Both A and R are true and R is the correct explanation of A.

    b) Both A and R are true but R is not the correct explanation of A.

    c) A is true but R is false.

    d) A is false but R is true.

25. **Assertion (A):** Distance of point (a, b) from origin is $\sqrt{b^2 - a^2}$ **[1]**

Reason (R): Distance of point (x, y) from origin is $\sqrt{(x - 0)^2 + (y - 0)^2}$

    a) Both A and R are true and R is the correct

    b) Both A and R are true but R is not the

explanation of A. correct explanation of A.

c) A is true but R is false. d) A is false but R is true.

26. **Assertion (A):** Distance between (5, 12) and origin is 13 units. **[1]**

Reason (R): D = $\sqrt{\left(x_1 - x_2\right)^2 + \left(y_1 - y_2\right)^2}$

a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

27. **Assertion (A):** If A(2a, 4a) and B(2a, 6a) are two vertices of an equilateral triangle ABC then the vertex C is given by (2a + $a\sqrt{3}$, 5a). **[1]**

Reason (R): In an equilateral triangle, all the coordinates of three vertices can be rational.

a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

28. **Assertion (A):** Image of point (5, –16) under x-axis is (–5, 16). **[1]**

Reason (R): To find image of point (x, y) under x-axis change the sign of y and to find image under y-axis change sign of x.
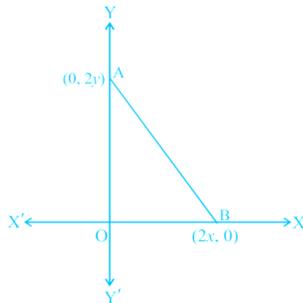
a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

29. The coordinates of the point which is equidistant from the three vertices of a ΔAOB as shown in the figure is **[1]**

a) $\left(\frac{x}{2}, \frac{y}{2}\right)$

b) (y, x)

c) (0, 0)

d) (x, y)

30. The point (-3, 5) lies in the _____ quadrant **[1]**

a) 4th

b) 2nd

c) 3rd

d) 1st

Section B

31. Find a point on y-axis which is equidistant from the points (5, -2) and (-3, 2). **[2]**

32. Find the distance of A(5, -12) points from the origin. **[2]**

33. If the distance between the points (3, 0) and (0, y) is 5 units and y is positive, then what is the value of y? **[2]**

34. Find the distance between the points (0, 0) and (36, 15). **[2]**

35. Find the distance between the points (0, 0) and (36, 15). Also, find the distance between towns A and B if town B is located at 36 km east and 15 km north of town A. (In km) **[2]**

36. What is the distance between the points (5 sin 60°, 0) and (0, 5 sin 30°)? **[2]**

37. Find the distance between the points: A(9, 3) and B(15, 11). **[2]**

38. Find the distance between the points $\left(\frac{-8}{5}, 2\right)$ and $\left(\frac{2}{5}, 2\right)$. **[2]**

39. If a point A (0, 2) is equidistant from the points B(3, p) and C(p, 5), then find the value of p. **[2]**

Section C

40. Show that A(0, -2), B(3, 1), C(0,4) and D(-3, 1) are the vertices of a square. **[5]**

41. Using analytical geometry, prove that the diagonals of a rhombus are perpendicular to each other. **[5]**

42. Show that the points O(0,0), A(3, $\sqrt{3}$) and B(3, - $\sqrt{3}$)) are the vertices of an equilateral triangle. Find the area of this triangle. **[5]**

43. Show that A(-3, 2), B(-5, -5), C(2, -3) and D(4, 4) are the vertices of a rhombus. **[5]**

44. If (-4, 3) and (4, 3) are two vertices of an equilateral triangle, find the coordinates of the third vertex, given that the origin lies in the **[5]**

    i. interior,

    ii. exterior of the triangle.

45. Show that the points A(2,1), B(5, 2), C(6,4) and D(3, 3) are the angular points of a parallelogram. Is this figure a rectangle? **[5]**

46. If the point A(2, –4) is equidistant from P(3, 8) and Q(–10, y) then find the values of y. Also find distance PQ. **[5]**

47. Show that A(6, 2), B(2, 1), C(1, 5) and D(5, 6) are the vertices of a square. **[5]**

48. Prove that the points (3, -2), (4, 0), (6, -3) and (5, -5) are the vertices of a parallelogram. **[5]**

49. Find the point on the x-axis which is equidistant from (2,-5) and (-2,9) **[5]**

50. If 'a' is the length of one of the sides of an equilateral triangle ABC, base BC lies on x-axis and vertex B is at the origin, find the coordinates of the vertices of the triangle ABC. **[5]**

51. If (-4, 3) and (4, 3) are two vertices of an equilateral triangle, find the coordinates of the third vertex, given that the origin lies in the interior of the triangle. **[5]**

52. Find the value of a when the distance between the points (3, a) and (4,1) is $\sqrt{10}$. **[5]**

53. Show that the points A(3,1), B(0, -2), C(1, 1) and D(4, 4) are the vertices of a parallelogram ABCD. **[5]**

54. Show that the points A(6,1), B(8,2), C(9,4) and D(7,3) are the vertices of a rhombus. Find its area. **[5]**

55. If two opposite vertices of a square are (5, 4) and (1, -6), find the coordinates of its remaining two vertices. **[5]**

56. Show that the points (1, 1), (-1, 5), (7, 9) and (9, 5) taken in the order are the vertices of a rectangle. **[5]**

57. Show that A(2, -2), B(14,10), C(11,13) and D(-1, 1) the vertices of a rectangle. **[5]**

58. Three consecutive vertices of a parallelogram are (-2, -1), (1, 0) and (4, 3). Find the fourth vertex. **[5]**

59. Prove that the points (-4, -1), (-2, -4), (4, 0) and (2, 3) are the vertices of a rectangle. **[5]**

60. Name the type of quadrilateral formed, if any, by the points (-1, -2), (1, 0), (-1, 2), (-3, 0), and give a reason for your answer. **[5]**

61. Show that the A(0, -4), B(6, 2), C(3, 5) and D(-3, -1) vertices of a rectangle. **[5]**

Section D

62. **Fill in the blanks:** **[6]**

    (a) The Abscissa is _____ to the right of y-axis and is _____ to the left of y-axis. **[1]**

    (b) The mirror image of (3, 9) on x-axis is _____. **[1]**

    (c) If the vertices of a triangle have integral coordinates, then the triangle cannot be _____ triangle. **[1]**

    (d) The distance between the points (10 cos 30°, 0) and (0, 10 cos 60°) is _____. **[1]**

    (e) If three or more than three points lie on a same line, then they are called _____ points. **[1]**

(f)   The distance between the points P(-6, 7) and Q(-1, -5) is _____ units. **[1]**

<div align="center">**Section E**</div>

63. **State True or False:** **[8]**

(a)   If the co-ordinates of a point are (3, -7), then its ordinate is -7. **[1]**

(b)   Point X(2, 2), Y(0, 0) and Z(3, 0) are not collinear. **[1]**

(c)   The distance between the points (-6, 7) and (-1, -5) is 13 units. **[1]**

(d)   Let P(x, y) be a point and O(0, 0) be the origin. Then, the distance of P from O is given by OP = $\sqrt{x^2 + y^2}$. **[1]**

(e)   The point (-3, 5) lies in the III quadrant. **[1]**

(f)   The distance between the points (a, a) and $\left(-\sqrt{3}a, \sqrt{3}a\right)$ is $2a\sqrt{2}$ units. **[1]**

(g)   The perimeter of a triangle with vertices (0, 4), (0, 0) and (3, 0) is 12 units. **[1]**

(h)   The distance of the point P(2, 3) from the X-axis is 3 units. **[1]**