MATHEMATICS

| Board – CBSE | Class – 11 | Topic – Straight Lines |

Very Short Answer Type Questions (1 Mark)

1. Three consecutive vertices of a parallelogram are (–2, –1), (1, 0) and (4, 3), find the fourth vertex.

2. For what value of k are the points (8, 1), (k, –4) and (2, –5) collinear?

3. The midpoint of the segment joining (a, b) and (–3, 4b) is (2, 3a + 4). Find a and b.

4. Coordinates of centroid of Δ ABC are (1, –1). Vertices of Δ ABC are A(–5, 3), B(p, –1) and C(6, q). Find p and q.

5. In what ratio y-axis divides the line segment joining the points (3,4) and (–2, 1)?

6. What are the possible slopes of a line which makes equal angle with both axes?

7. Determine x so that slope of line through points (2, 7) and (x, 5) is 2.

8. Show that the points (a, 0), (0, b) and (3a – 2b) are collinear.

9. Write the equation of a line which cuts off equal intercepts on coordinate axes and passes through (2, 5).

10. Find k so that the line $2x + ky – 9 = 0$ may be perpendicular to $2x + 3y – 1 = 0$

11. Find the acute angle between lines $x + y = 0$ and $y = 0$

12. Find the angle which $\sqrt{3}\,x + y + 5 = 0$ makes with positive direction of x-axis.

13. If origin is shifted to (2, 3), then what will be the new coordinates of (–1, 2)?

14. On shifting the origin to (p, q), the coordinates of point (2, –1) changes to (5, 2). Find p and q.

Short Answer Type Questions (4 Marks)

15. If the image of the point (3, 8) in the line $px + 3y – 7 = 0$ is the point (–1, –4), then find the value of p.

16. Find the distance of the point (3,2) from the straight line whose slope is 5 and is passing through the point of intersection of lines $x + 2y = 5$ and $x – 3y + 5 = 0$

17. The line $2x – 3y = 4$ is the perpendicular bisector of the line segment AB. If coordinates of A are (–3, 1) find coordinates of B.

18. The points (1, 3) and (5, 1) are two opposite vertices of a rectangle. The other two vertices lie on line $y = 2x + c$. Find c and remaining two vertices.

19. If two sides of a square are along $5x – 12y + 26 = 0$ and $5x – 12y – 65 = 0$ then find its area.

20. Find the equation of a line with slope –1 and whose perpendicular distance from the origin is equal to 5.

21. If a vertex of a square is at (1, –1) and one of its side lie along the line 3x – 4y – 17 = 0 then find the area of the square.

22. Find the coordinates of the orthocenter of a triangle whose vertices are (–1, 3) (2, –1) and (0, 0). [Orthocenter is the point of concurrency of three altitudes].

23. Find the equation of a straight line which passes through the point of intersection of 3x + 4y – 1 = 0 and 2x – 5y + 7 = 0 and which is perpendicular to 4x – 2y + 7 = 0.

24. If the image of the point (2, 1) in a line is (4, 3) then find the equation of line.

Long Answer Type Questions (6 Marks)

25. Find points on the line x + y + 3 = 0 that are at a distance of $\sqrt{5}$ units from the line x + 2y + 2 = 0

26. Find the equation of a straight line which makes acute angle with positive direction of x–axis, passes through point (–5, 0) and is at a perpendicular distance of 3 units from origin.

27. One side of a rectangle lies along the line 4x + 7y + 5 = 0. Two of its vertices are (–3, 1) and (1,1). Find the equation of other three sides.

28. If (1,2) and (3, 8) are a pair of opposite vertices of a square, find the equation of the sides and diagonals of the square.

29. Find the equations of the straight lines which cut off intercepts on x–axis twice that on y–axis and are at a unit distance from origin.

30. Two adjacent sides of a parallelogram are 4x + 5y = 0 and 7x + 2y = 0. If the equation of one of the diagonals is 11x + 7y = 4, find the equation of the other diagonal.

Answer

1. (1, 2)
2. k = 3
3. a = 7, b = 10
4. p = 2, q = –5
5. 3 : 2 (internally)
6. ±1
7. 1
9. x + y = 7
10. $\dfrac{-4}{3}$
11. $\dfrac{\pi}{4}$

12. $\frac{2\pi}{3}$

13. $(-3, -1)$

14. $p = -3, q = -3$

15. 1

16. $\frac{10}{\sqrt{26}}$

17. $(1, -5)$

18. $c = -4, (2,0), (4, 4)$

19. 49 square units

20. $x + y + 5\sqrt{2} = 0, x + y - 5\sqrt{2} = 0$

21. 4 square units

22. $(-4, -3)$

23. $x + 2y = 1$

24. $x + y - 5 = 0$

25. $(1, -4), (-9, 6)$

26. $3x - 4y + 15 = 0$

27. $4x + 7y - 11 = 0, 7x - 4y + 25 = 0$

    $7x - 4y - 3 = 0$

28. $x - 2y + 3 = 0, 2x + y - 14 = 0,$

    $x - 2y + 13 = 0, 2x + y - 4 = 0$

    $3x - y - 1 = 0, x + 3y - 17 = 0$

29. $x + 2y + \sqrt{5} = 0, x + 2y - \sqrt{5} = 0$

30. $x = y$