CHAPTER TEST: LINEAR EQUATIONS & COORDINATES (HOTS)

Mathematics | Class IX | (2026/LINEQ-HOTS/09/001)

Time: 1.5 Hours **Max. Marks: 40**

General Instructions:

- All questions are compulsory.
- Section A contains 8 MCQs of 1 mark each.
- Section B contains 4 Very Short Answer questions of 2 marks each.
- Section C contains 3 Short Answer questions of 3 marks each.
- Section D contains 3 Long Answer/HOTS questions of 5 marks each.

Section A: Multiple Choice Questions (1 Mark Each)

1. If the linear equation $ax + by + c = 0$ passes through the origin, then the value of c is:

   (a) a (b) b (c) 0 (d) 1

2. The graph of $y = mx$ always passes through:

   (a) $(m, 0)$ (b) $(0, m)$ (c) $(0, 0)$ (d) $(1, 1)$

3. If we shift the graph of $y = 2x$ three units upwards, the new equation is:

   (a) $y = 2x + 3$ (b) $y = 3x + 2$ (c) $y = 2x - 3$ (d) $y = 5x$

4. The number of lines passing through the point $(5, 7)$ is:

   (a) 1 (b) 2 (c) 100 (d) Infinite

5. The area of the triangle formed by the line $x + y = 4$ and the coordinate axes is:

   (a) 4 sq. units (b) 8 sq. units (c) 16 sq. units (d) 2 sq. units

6. If the point $(k, 2k - 3)$ lies on the line $x + y = 6$, the value of k is:

   (a) 3 (b) 2 (c) 5 (d) 4

7. The linear equation $2x - 5y = 7$ has:

   (a) A unique solution (b) Two solutions (c) No solution (d) Infinitely many

8. A line parallel to the Y-axis and 5 units to its left is represented by:

   (a) $y = -5$ (b) $x = -5$ (c) $x = 5$ (d) $y = 5$

Section B: Very Short Answer Questions (2 Marks Each)

1. Find the point where the graph of the equation $3x + 4y = 12$ cuts the x-axis and the y-axis.
2. Express y in terms of x for the equation $2x - 3y + 5 = 0$. Check if $(-1, 1)$ is a solution.
3. Find the value of k if $x = 2, y = 1$ is a solution of the equation $(k - 2)x + 4y = 10$.
4. Write the equation of a line which is parallel to the X-axis and passes through the point of intersection of lines $x = 2$ and $y = 3$.

Section C: Short Answer Questions (3 Marks Each)

1. If the point $(2k - 3, k + 2)$ lies on the graph of the equation $2x + 3y + 15 = 0$, find the value of k.
2. Draw the graph of $y = 2x + 1$ and $y = 2x - 3$ on the same Cartesian plane. What do you observe about the lines?
3. The cost of a pen is Rs 5 more than the cost of a notebook. Write a linear equation in two variables to represent this statement and find three solutions for the same.

Section D: Long Answer / HOTS Questions (5 Marks Each)

1. **Analytical Modeling:** A taxi charges a fixed fare of Rs 50 for the first 2 km and Rs 15 per km for the subsequent distance.
   (i) Write a linear equation representing the total fare (y) for a distance (x).
   (ii) Draw the graph for this equation.
   (iii) From the graph, find the fare for 10 km.
   (iv) If a person pays Rs 230, what distance did they travel?
2. **Geometric Application:** The points $A(0, 4), B(6, 4)$ and $C(6, 0)$ are three vertices of a rectangle $OABC$, where O is the origin.
   (i) Plot these points and join them to form the rectangle.
   (ii) Find the coordinates of the mid-point of diagonal OB.
   (iii) Write the equations of the lines representing the sides AB and BC.
3. **Constraint Solving:** Find the area of the quadrilateral formed by the lines $x = 1, x = 4, y = 2$, and $y = 5$. Identify the specific type of quadrilateral formed. Prove your answer by calculating the lengths of the sides.