

CHAPTER TEST: LINEAR EQUATIONS IN TWO VARIABLES

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

Time: 1.5 Hours

Max. Marks: 40

General Instructions:

1. All questions are compulsory.
 2. The question paper consists of five sections: A, B, C, D, and E.
 3. Section A contains 8 MCQs of 1 mark each.
 4. Section B contains 4 Very Short Answer questions of 2 marks each.
 5. Section C contains 3 Short Answer questions of 3 marks each.
 6. Section D contains 2 Long Answer questions of 5 marks each.
 7. Section E contains 1 Case Study with 5 MCQs of 1 mark each.
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Section A (Multiple Choice Questions)

1. The linear equation $2x - 5y = 7$ has:
 - (a) A unique solution
 - (b) Two solutions
 - (c) Infinitely many solutions
 - (d) No solution
2. Any point on the line $y = x$ is of the form:
 - (a) (a, a)
 - (b) $(0, a)$
 - (c) $(a, 0)$
 - (d) $(a, -a)$
3. The graph of the linear equation $2x + 3y = 6$ cuts the Y-axis at the point:
 - (a) $(2, 0)$
 - (b) $(0, 3)$
 - (c) $(3, 0)$
 - (d) $(0, 2)$
4. The equation $x = 7$, in two variables, can be written as:
 - (a) $1.x + 1.y = 7$
 - (b) $1.x + 0.y = 7$
 - (c) $0.x + 1.y = 7$
 - (d) $0.x + 0.y = 7$

5. If $(2, 0)$ is a solution of the linear equation $2x + 3y = k$, then the value of k is:
- (a) 4
 - (b) 6
 - (c) 5
 - (d) 2
6. The graph of $y = 6$ is a line:
- (a) Parallel to the X-axis at a distance of 6 units from the origin.
 - (b) Parallel to the Y-axis at a distance of 6 units from the origin.
 - (c) Making an intercept 6 on the X-axis.
 - (d) Passing through the origin.
7. How many linear equations in x and y can be satisfied by $x = 1$ and $y = 2$?
- (a) Only one
 - (b) Only two
 - (c) Infinitely many
 - (d) Three
8. If we multiply or divide both sides of a linear equation with a non-zero number, then the solution of the linear equation:
- (a) Changes
 - (b) Remains the same
 - (c) Changes in case of multiplication only
 - (d) Changes in case of division only

Section B (Very Short Answer Questions)

1. Express the linear equation $\sqrt{2}x - 4 = 3y$ in the form $ax + by + c = 0$ and indicate the values of a, b , and c . (2)
2. Find two solutions for the equation $4x + 3y = 12$. (2)
3. Check whether $(-1, 4)$ and $(0, k)$ are solutions of $3x + y = 1$. If $(0, k)$ is a solution, find k . (2)
4. Write the equation of a line parallel to the X-axis and passing through the point $(-3, -4)$. (2)

Section C (Short Answer Questions)

1. Draw the graph of the equation $2x + y = 4$. From the graph, find the value of y when $x = 3$. (3)
2. The taxi fare in a city is as follows: For the first kilometer, the fare is Rs 8 and for the subsequent distance it is Rs 5 per km. Taking the distance covered as x km and total fare as Rs y , write a linear equation for this information and draw its graph. (3)
3. Solve the equation $2x + 1 = x - 3$ and represent the solution(s) on: (i) The number line. (3)
(ii) The Cartesian plane.

Section D (Long Answer Questions)

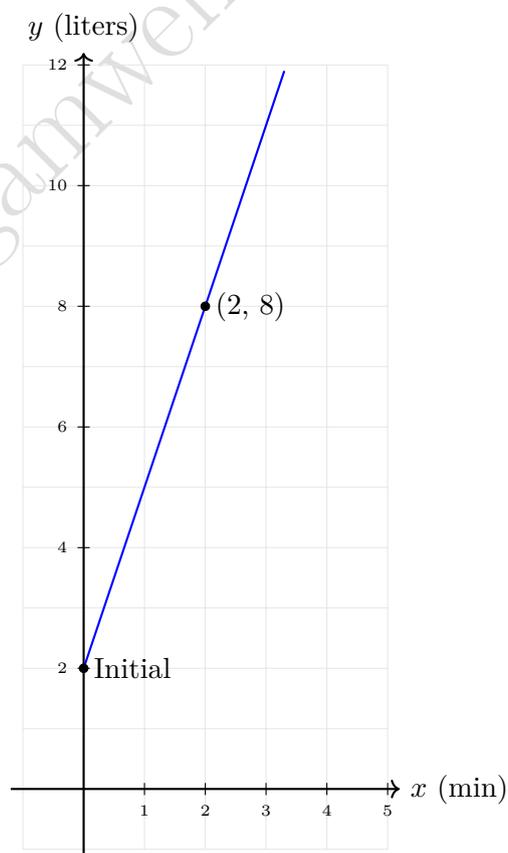
1. Draw the graphs of the equations $x - y = 1$ and $2x + y = 8$ in the same Cartesian plane.
(i) Find the coordinates of the point where the two lines intersect. (ii) Determine the area of the triangle formed by these lines and the X-axis. (5)
2. Yamini and Fatima, two students of Class IX of a school, together contributed Rs 100 towards the Prime Minister's Relief Fund to help the earthquake victims. (i) Write a linear equation which satisfies this data. (ii) Draw the graph of the same. (iii) If Yamini contributed Rs 60, find Fatima's contribution using the graph. (5)

Section E (Case Study Based Question)

Case Study: The Science Fair Project

In a school science fair, Rohan designed a smart irrigation system that releases water based on the moisture level of the soil. He observed that the relationship between the time the pump is active (x minutes) and the amount of water released (y liters) can be modeled by a linear equation. For every minute the pump runs, it releases 3 liters of water, but there is an initial 2 liters already present in the pipes before the measurement starts. Thus, the total water released is given by the equation $y = 3x + 2$. Rohan needs to present a table of values and a graph to the judges to show how the system scales over a 10-minute interval. He explains that since time and volume can take any fractional value, the equation has infinitely many solutions within the physical constraints of his tank capacity.

[Image of a graph of a linear equation]



Based on the above information, answer the following questions:

1. What is the total water released if the pump runs for 4 minutes?
 - (a) 12 liters
 - (b) 14 liters
 - (c) 10 liters
 - (d) 15 liters
2. What is the value of the constant 'c' if the equation is written in the form $ax + by + c = 0$?
 - (a) 2
 - (b) -2
 - (c) 3
 - (d) 0
3. At what point does the graph intersect the Y-axis?
 - (a) (2, 0)
 - (b) (0, 2)
 - (c) (3, 0)
 - (d) (0, 3)
4. If the total water released is 17 liters, for how long was the pump active?
 - (a) 5 minutes
 - (b) 4.5 minutes
 - (c) 6 minutes
 - (d) 5.5 minutes
5. Which point does NOT lie on the line $y = 3x + 2$?
 - (a) (1, 5)
 - (b) (3, 11)
 - (c) (2, 9)
 - (d) (0, 2)