SOLUTIONS

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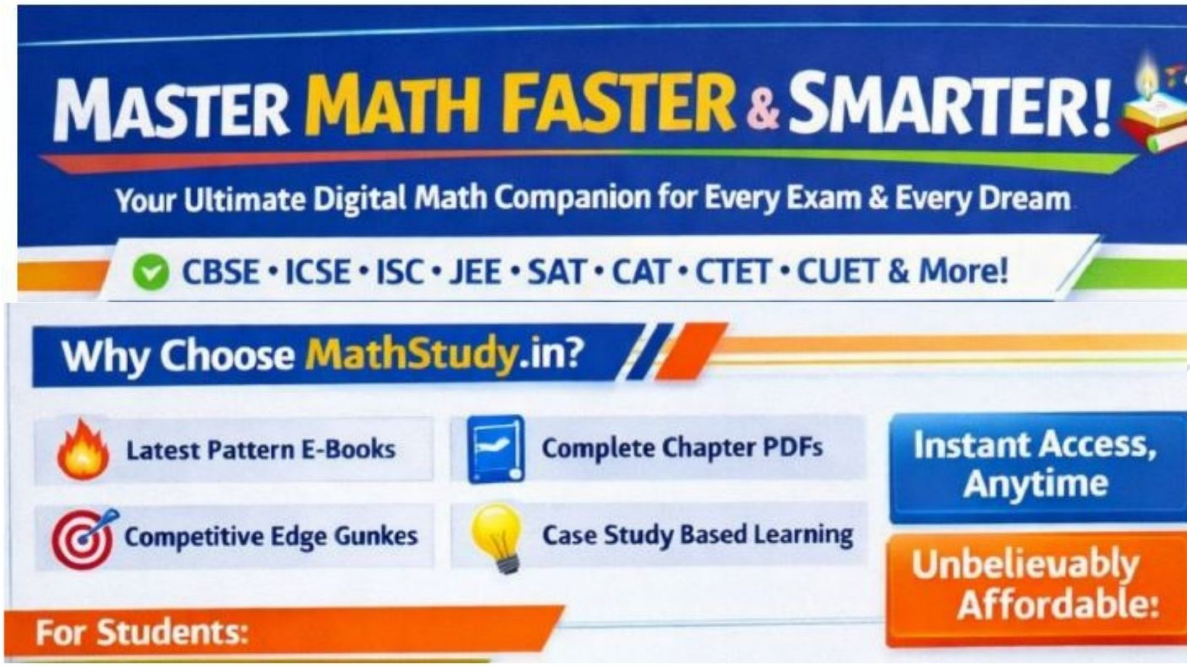

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SOLUTIONS: LINEAR EQUATIONS IN TWO VARIABLES

~~Mathematics | Class IX (2026/LinEq/09/NCERT/001)~~

Section A: Multiple Choice Questions

1. **(a)** $2x - y + 1 = 0$**.**
   Calculation: $3x - y = x - 1 \implies 3x - x - y + 1 = 0 \implies 2x - y + 1 = 0$.

2. **(b) 3.**
   Substitute $x = 2$ and $y = k$ in $2x + 3y = 13$:
   $2(2) + 3(k) = 13 \implies 4 + 3k = 13 \implies 3k = 9 \implies k = 3$.

3. **(b) Parallel to y-axis.**
   Any equation of the form $x = a$ is a vertical line parallel to the Y-axis.

4. **(d)** (a, a)**.**
   Since the y-coordinate must equal the x-coordinate, both must be the same value a.

5. **(a)** $2x + 0y + 5 = 0$**.**
   To represent it in two variables, the missing variable y is given a coefficient of 0.

Section B: Short Answer Questions

6. **Equation:** $4x + 3y = 12$.
   Let $x = 0 \implies 3y = 12 \implies y = 4$. Solution: **(0, 4)**.
   Let $y = 0 \implies 4x = 12 \implies x = 3$. Solution: **(3, 0)**.
   Checking $(3, 0)$: $4(3) + 3(0) = 12 + 0 = 12$. Since $LHS = RHS$, it is a solution.

7. $3x - 2y = 8 \implies 3x - 8 = 2y \implies \mathbf{y = \frac{3x-8}{2}}$.
   When $x = 2$: $y = \frac{3(2)-8}{2} = \frac{6-8}{2} = \frac{-2}{2} = \mathbf{-1}$.

8. For $(1, 4)$, example lines: (i) $x + y = 5$ (ii) $y = 4x$.
   There are **infinitely many** such lines because an infinite number of lines can pass through a single point.

9. Substitute $(3, 4)$ into $3y = ax + 7$:
   $3(4) = a(3) + 7 \implies 12 = 3a + 7 \implies 5 = 3a \implies \mathbf{a = \frac{5}{3}}$.

Section C: Long Answer Questions

10. **Equation:** $2x + y = 6$.
    Points for table: $(0, 6), (3, 0), (1, 4)$.
    Line cuts X-axis at **(3, 0)** and Y-axis at **(0, 6)**.

11. Let distance $= x$ km and total fare $= y$.
    Fare for 1st km = Rs 20. Remaining distance $= (x - 1)$ km.
    Equation: $y = 20 + 12(x - 1) \implies y = 20 + 12x - 12 \implies \mathbf{y = 12x + 8}$.

12. $2x + 1 = x - 3 \implies 2x - x = -3 - 1 \implies \mathbf{x = -4}$.
    (a) **Number line:** A dot on -4.
    (b) **Cartesian plane:** A vertical line passing through $x = -4$.

13. Let Yamini's contribution $= x$, Fatima's $= y$. Equation: $x + y = 200$.
    If Fatima contributed $y = 120$, then $x + 120 = 200 \implies x = 80$.
    Yamini contributed **Rs 80**.

Section D: True or False

1. **True.** The graph is the set of all points that satisfy the equation.
2. **False.** The graph of $y = m$ is parallel to the **x-axis**.
3. **True.** This condition ensures that a and b are not both zero simultaneously.
4. **False.** A linear equation in two variables has **infinitely many** solutions.