

Mathematics

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(Chapter – 3) (Pair of Linear Equations in Two Variables)(Exemplar Problems)
(Class – X)

Exercise 3.1

Choose the correct answer from the given four options:

Question 2:

The pair of equations $x + 2y + 5 = 0$ and $-3x - 6y + 1 = 0$ have

- (A) a unique solution (B) exactly two solutions
(C) infinitely many solutions (D) no solution

Answer 2:

(D) no solution

Solution:

The given equations are $x + 2y + 5 = 0$ and $-3x - 6y + 1 = 0$.

Comparing with $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$, we have

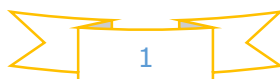
$$\frac{a_1}{a_2} = \frac{1}{-3} = -\frac{1}{3}, \quad \frac{b_1}{b_2} = \frac{2}{-6} = -\frac{1}{3} \quad \text{and} \quad \frac{c_1}{c_2} = \frac{5}{1}$$

Now we observe that:

$$\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$$

Using the following table:

Condition	Conclusion
If $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$	A unique solution
If $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$	No solution
If $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$	Infinite many solutions



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We conclude that the lines have no solutions.

Hence, the option (D) is correct.

