

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 1:

Graphically, the pair of equations $6x - 3y + 10 = 0$ and $2x - y + 9 = 0$ represents two lines which are

- (A) intersecting at exactly one point. (B) intersecting at exactly two points.
(C) coincident. (D) parallel.

Answer 1:

(D) parallel.

Solution:

The given equations are $6x - 3y + 10 = 0$ and $2x - y + 9 = 0$

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

$$\frac{a_1}{a_2} = \frac{6}{2} = \frac{3}{1}, \quad \frac{b_1}{b_2} = \frac{-3}{-1} = \frac{3}{1} \quad \text{and} \quad \frac{c_1}{c_2} = \frac{10}{9}$$

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 $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$	Intersecting lines
If $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$	Parallel lines
If $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$	Coincident lines

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We conclude that the lines are parallel.

Hence, the option (D) is correct.

