Exercise 3.1

Choose the correct answer from the given four options:

Question 10:

A pair of linear equations which has a unique solution $x = 2, y = -3$ is

(A) $x + y = -1$
$2x - 3y = -5$

(B) $2x + 5y = -11$
$4x + 10y = -22$

(C) $2x - y = 1$
$3x + 2y = 0$

(D) $x - 4y - 14 = 0$
$5x - y - 13 = 0$

Answer 10:

(D) $x - 4y - 14 = 0$

$5x - y - 13 = 0$

Solution:

For case (A), given equations $x + y = -1$ and $2x - 3y = -5$.

Putting $x = 2, y = -3$ in LHS of equation $x + y = -1$, we get

$2 - 3 = -1 =$ RHS

Putting $x = 2, y = -3$ in LHS of equation $2x - 3y = -5$, we get

$2 \times 2 - 3 \times (-3) = 4 + 9 = 13 \neq -5 \neq$ RHS

Since $x = 2, y = -3$ is satisfying only one of the two equations.

So, option (A) is false.

Now, for case (B), given equations $2x + 5y = -11$ and $4x + 10y = -22$.

Putting $x = 2, y = -3$ in LHS of equation $2x + 5y = -11$, we get

$2 \times 2 + 5 \times (-3) = 4 - 15 = -11 =$ RHS

Putting $x = 2, y = -3$ in LHS of equation $4x + 10y = -22$, we get

$4 \times 2 + 10 \times (-3) = 8 - 30 = -12 \neq -22 \neq$ RHS

Since $x = 2, y = -3$ is satisfying only one of the two equations.

So, option (B) is false.

Now, for case (C), given equations $2x - y = 1$ and $3x + 2y = 0$.

Putting $x = 2, y = -3$ in LHS of equation $2x - y = 1$, we get

$2 \times 2 - (-3) = 4 + 3 = 7 \neq 1 \neq$ RHS

Putting $x = 2, y = -3$ in LHS of equation $3x + 2y = 0$, we get

$3 \times 2 + 2 \times (-3) = 6 - 6 = 0 =$ RHS

Since $x = 2, y = -3$ is satisfying only one of the two equations.

So, option (C) is false.

Now, for case (D), given equations $x - 4y - 14 = 0$ and $5x - y - 13 = 0$.

Putting $x = 2, y = -3$ in LHS of equation $x - 4y - 14 = 0$, we get

$2 - 4 \times (-3) - 14 = 2 + 12 - 14 = 0 =$ RHS

Putting $x = 2, y = -3$ in LHS of equation $5x - y - 13 = 0$, we get

$5 \times 2 - (-3) - 13 = 10 + 3 - 13 = 0 =$ RHS

Since $x = 2, y = -3$ is satisfying both the equations.

So, option (D) is true.

Hence, the option (D) is correct.