

*Example :*

Solve  $3x + 4y = 8$  and  $x - 6y = 10$  using Carmer's method.

Solution :

Given that , $3x + 4y = 8$  and  $x - 6y = 10$

Express the given equations in matrix form, we get,

$$A = \begin{pmatrix} 3 & 4 \\ 1 & -6 \end{pmatrix}; X = \begin{pmatrix} x \\ y \end{pmatrix} \text{ and } B = \begin{pmatrix} 8 \\ 10 \end{pmatrix}$$

First we check that A is a singular matrix or non - singular matrix.

If it is non - singular matrix then proceed for next step.

$$|A| = ad - bc = -18 - 4 = -22 \neq 0.$$

Now construct two square matrix  $B_1$  and  $B_2$  from A as follows.

$B_1$  is obtained by replacing the first column of A with elements 8 and 10 of B.

$$\text{i.e. } B_1 = \begin{pmatrix} 8 & 4 \\ 10 & -6 \end{pmatrix}$$

Similarly,  $B_2$  is obtained by replacing the second column of A with the elements 8 and 10 of B.

$$\text{i.e. } B_2 = \begin{pmatrix} 3 & 8 \\ 1 & 10 \end{pmatrix}$$

Now obtain  $|B_1|$  and  $|B_2|$  the determinants of the matrices  $B_1$  and  $B_2$ . Write the solution for the solution for the given set equations.