9. The feasible region for a LPP is shown in Fig. 12.10. Evaluate Z = 4*x* + *y* at each of the corner points of this region. Find the minimum value of Z, if it exists.

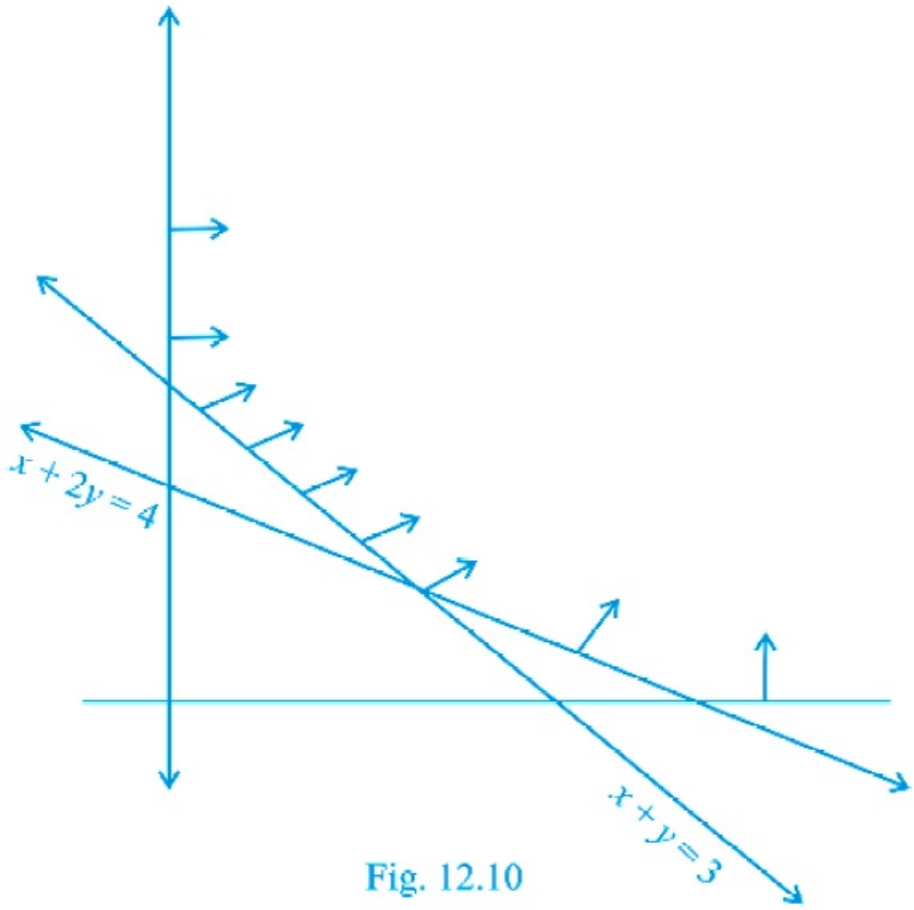


Fig. 12.10

Solution:

Given: Z = 4x + y

In the given figure, ABC is the feasible region which is open unbounded.

Here, we have

x + y = 3 … (i)

and x + 2y = 4 …. (ii)

On solving equations (i) and (ii), we get

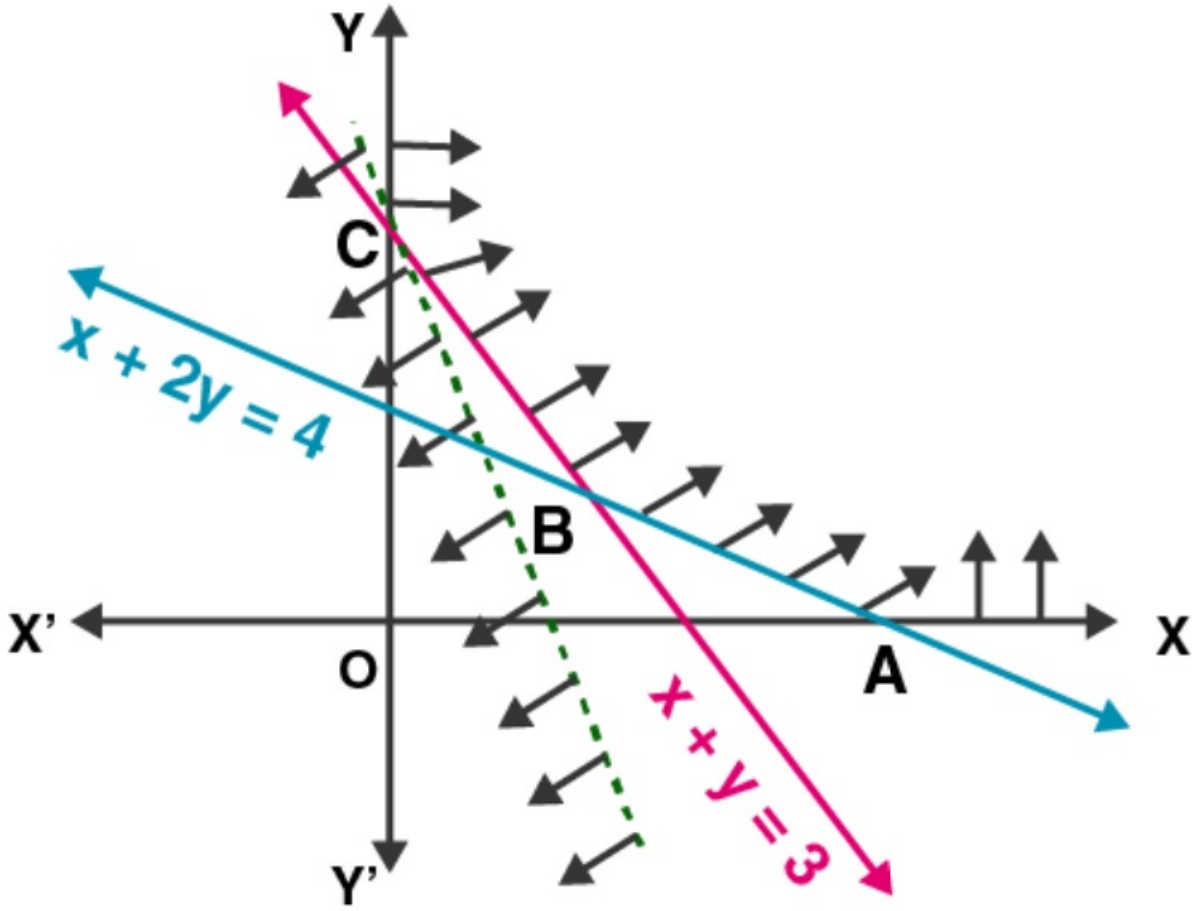
x = 2 and y = 1

So, the corner points are A(4, 0), B(2, 1) and C(0, 3)

Now on evaluating the value of Z, we have

Corner points	Z = 4x + y

A(4, 0)	Z = 4(4) + (0) = 16
B(2, 1)	Z = 4(2) + (1) = 9
C(0, 3)	Z = 4(4) + (3) = 3



Now, the minimum value of Z is 3 at (0, 3) but as, the feasible region is open bounded so it may or may not be the minimum value of Z.

Hence, in order to face such a situation, we usually draw a graph of 4x + y < 3 and check whether the resulting open half plane has no point in common with feasible region. Otherwise Z will have no minimum value. So, from the graph, we can conclude that there is no common point with the feasible region.

Therefore, the function Z has the minimum value at (0, 3).