5.8.4

EE25BTECH11006 - ADUDOTLA SRIVIDYA

Question:
Half the perimeter of a rectangular garden, whose length is $4m$, more than its width, is $36m$. Find the dimensions of the garden.

Solution:

$$perimeter = 2(l + b) \tag{1}$$

$$\implies l + b = 18 \tag{2}$$

given,

$$l - b = 4 \tag{3}$$

$$\begin{pmatrix} 1 & 1 \\ 1 & -1 \end{pmatrix} \begin{pmatrix} l \\ b \end{pmatrix} = \begin{pmatrix} 18 \\ 4 \end{pmatrix} \tag{4}$$

$$\left(\begin{array}{cc|c} 1 & 1 & 18 \\ 1 & -1 & 4 \end{array}\right) \tag{5}$$

$$R_2 \to R_2 - R_1 \implies \left(\begin{array}{cc|c} 1 & 1 & 18 \\ 0 & -2 & -14 \end{array}\right) \tag{6}$$

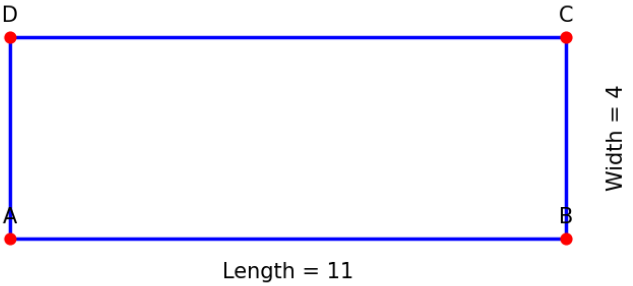
$$R_2 \to -1/2R_2 \implies \left(\begin{array}{cc|c} 1 & 1 & 18 \\ 0 & 1 & 7 \end{array}\right) \tag{7}$$

$$R_1 \to R_1 - R_2 \implies \left(\begin{array}{cc|c} 1 & 0 & 11 \\ 0 & 1 & 7 \end{array}\right) \tag{8}$$

$$\implies \begin{pmatrix} l \\ b \end{pmatrix} = \begin{pmatrix} 11 \\ 7 \end{pmatrix} \tag{9}$$

Therefore,

$$l = 11 \qquad b = 7 \tag{10}$$


D
C
A
B
Width = 4
Length = 11