

5.8.31

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:

$$perimeter = 2(l + b) \quad (1)$$

$$\implies l + b = 18 \quad (2)$$

given,

$$l - b = 4 \quad (3)$$

$$\begin{pmatrix} 1 & 1 \\ 1 & -1 \end{pmatrix} \begin{pmatrix} l \\ b \end{pmatrix} = \begin{pmatrix} 18 \\ 4 \end{pmatrix} \quad (4)$$

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

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

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

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

$$\implies \begin{pmatrix} l \\ b \end{pmatrix} = \begin{pmatrix} 11 \\ 7 \end{pmatrix} \quad (9)$$

Therefore,

$$l = 11 \quad b = 7 \quad (10)$$

