

Manufacturing Problem

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I. PROBLEM STATEMENT

- 1) A manufacturing company makes two models A and B of a product. Each piece of Model A requires 9 labour hours for fabricating and 1 labour hour for finishing. Each piece of Model B requires 12 labour hours for fabricating and 3 labour hours for finishing. For fabricating and finishing, the maximum labour hours available are 180 and 30 respectively. The company makes a profit of Rs 8000 on each piece of model A and Rs 12000 on each piece of Model B. How many pieces of Model A and Model B should be manufactured per week to realise a maximum profit? What is the maximum profit per week?

II. SOLUTION

Formulation of problem

Let,

x = number of pieces of model A

y = number of pieces of model B

According to the question, the problem can be formulated as:

$$\text{minimize} \quad [80000 \quad 12000] \begin{bmatrix} x \\ y \end{bmatrix} \quad (1)$$

subject to

$$\begin{bmatrix} 3 & 4 \\ 1 & 3 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} \leq \begin{bmatrix} 60 \\ 30 \end{bmatrix} \quad (2)$$

Fig 1 shows the intersection of various lines and the optimal point indicated as P.
Code for generating above image is available here

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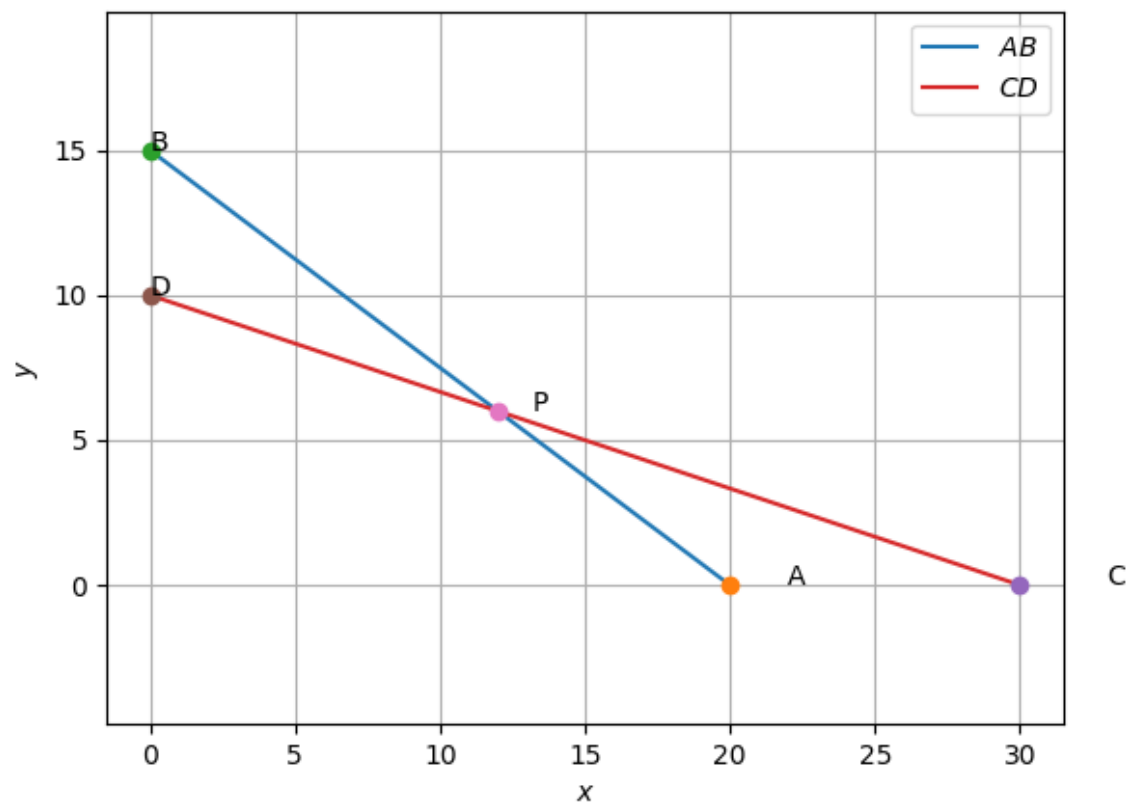


Fig. 1. Solution of Manufacturing Problem