Step-1

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Given that producing x_1 trucks and x_2 planes requires $x_1 + 50x_2$ tons of steel, $40x_1 + 1000x_2$ pounds of rubber, and $2x_1 + 50x_2$ months of labor.

Suppose the unit costs y_1, y_2, y_3 are $\$700$ per ton, \$3 perpound and \$3000 per month.

Given that Ax gives the amounts of steel, rubber, and labor to produce *x*.

We have to find *A*.

Step-2

From the given data, we get

$$Ax = \begin{bmatrix} x_1 + 50x_2 \\ 40x_1 + 1000x_2 \\ 2x_1 + 50x_2 \end{bmatrix}$$

$$= \begin{bmatrix} 1 & 50 \\ 40 & 1000 \\ 2 & 50 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix}$$

Therfore, $\boxed{A = \begin{bmatrix} 1 & 50 \\ 40 & 1000 \\ 2 & 50 \end{bmatrix}}$

Step-3

Here $(Ax)^T y$ is the cost of inputs while $x^T (A^T y)$ is the value of outputs.