

2. Now let Matrix X represents the number of units of wood (W), paint (P), and hardware (H) needed to make a chair (C), a table (T), and a desk (D). Matrix Y represents the cost for one unit of each of the necessary materials at plants located in Michigan (M), Florida (F), and Nevada (N).

$$X = \begin{matrix} & \begin{matrix} C & T & D \end{matrix} \\ \begin{matrix} W \\ P \\ H \end{matrix} & \begin{bmatrix} 4 & 1 & 2 \\ 12 & 3 & 6 \\ 7 & 5 & 14 \end{bmatrix} \end{matrix} \quad Y = \begin{matrix} & \begin{matrix} M & F & N \end{matrix} \\ \begin{matrix} W \\ P \\ H \end{matrix} & \begin{bmatrix} 1 & 1 & 2 \\ 2 & 3 & 1 \\ 3 & 2 & 4 \end{bmatrix} \end{matrix}$$

Hint: Since each matrix has meaning, only one of the products XY or YX will be meaningful.

a. Calculate the value and determine the meaning (if any) of the entry in row 1, column 1 of the product matrix XY . In the spaces below put both the numerical value and units of each entry. At the end, say what the sum of the products is equal to and what it means. If it is not meaningful, enter “meaningless”.

$(XY)_{11} =$ 4 units of wood to make a chair * \$1 per unit of wood in Michigan

+ _____ * _____

+ _____ * _____

= _____ which is _____

b. Calculate the value and determine the meaning (if any) of the entry in row 1, column 1 of the product matrix YX .

$(YX)_{11} =$ \$1 per unit of wood in Michigan * 4 units of wood to make a chair

+ _____ * _____

+ _____ * _____

= _____ which is _____

c. Which of the two products are meaningful? XY or YX ? _____

What does the meaningful product represent? _____