assignment-1

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(a) $\begin{bmatrix} 4 & 2 \\ -1 & 1 \end{bmatrix} M = 6I$ here I is unit matrix

we have to find order of matrix M?
let the order the matrix M is $a \times b$

we know that for multiply two matrix their order must be int the form of (x,y) (y,z) here $x, y, z \in N$ hence order of matrix will be $2 \times b$
so overall left hand side order is $(2 \times 2) \times (2 \times b) = (2 \times b)$
for comparing LHS=RHS their order must be same so
order of LHS= $(2 \times b)$, RHS=(2×2) hence b = 2.
hence the order of matrix M is (2×2).

(b) A=$\begin{bmatrix} 4 & 2 \\ -1 & 1 \end{bmatrix}$

$$AM = 6I$$

multiply by A^{-1} both side

$$M = A^{-1} \times 6I \qquad I \times M = M$$

by calculating we get $A^{-1} = \begin{bmatrix} \frac{1}{6} & \frac{-1}{3} \\ \frac{1}{6} & \frac{2}{3} \end{bmatrix}$

$$\text{here } 6I = \begin{bmatrix} 6 & 0 \\ 0 & 6 \end{bmatrix}$$

$$\text{by calculation we get } M = \begin{bmatrix} 1 & -2 \\ 1 & 4 \end{bmatrix}$$