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# CBY: AJAY MITTAL)

## Solution of worksheet M-4 (Matrice)

$$ON \cdot 4 \qquad A = \begin{bmatrix} 6 & -3 \\ -2 & 1 \end{bmatrix}$$

we have, A = IA

$$\Rightarrow \begin{bmatrix} 6 & -3 \\ -2 & 1 \end{bmatrix} = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} A$$

$$\Rightarrow \begin{bmatrix} 1 & -1/2 \\ -2 & 1 \end{bmatrix} = \begin{bmatrix} 1/6 & 0 \\ 0 & 1 \end{bmatrix} A$$

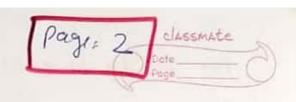
$$\Rightarrow \begin{bmatrix} 1 & -1/2 \\ -2 & 1 \end{bmatrix} = \begin{bmatrix} 1/6 & 0 \\ 0 & 1 \end{bmatrix} \neq 1$$

R2 -7 R2 + 2 R1

$$\Rightarrow \begin{bmatrix} 1 & \frac{1}{2} \\ 0 & 0 \end{bmatrix} = \begin{bmatrix} \frac{1}{6} & 0 \\ \frac{1}{3} & 0 \end{bmatrix} = A$$

Since 2 Row contains all 740s

: A does not exist



$$\begin{bmatrix} 1 & 0 & 1 \\ 0 & 1 & \frac{1}{2} \end{bmatrix} = \begin{bmatrix} 0 & \frac{1}{5} & \frac{1}{9} \\ 0 & \frac{3}{10} & \frac{-1}{5} \end{bmatrix} A$$

$$R_1 \rightarrow R_1 - R_3 \qquad \stackrel{P}{\leftarrow} \qquad R_2 \rightarrow R_2 - \stackrel{1}{\leftarrow} R_3$$

$$A^{-1} = \frac{1}{5} \begin{pmatrix} -2 & 0 & 3 \\ -1 & 1 & 0 \end{pmatrix} Am$$



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$$A^{-1} = \begin{bmatrix} 1 & -2/5 & -3/8 \\ -2/5 & 4/25 & 11/25 \end{bmatrix} Am$$

$$\begin{bmatrix} -3/5 & 1/25 & 9/25 \end{bmatrix}$$

Ov. 8 We have 
$$A = JA$$

$$\begin{pmatrix}
2 & 0 & -1 \\
5 & 1 & 0
\end{pmatrix} = \begin{pmatrix}
1 & 0 & 0 \\
0 & 1 & 0
\end{pmatrix}$$

$$\begin{pmatrix}
R_1 + 3R_1 \\
5 & 1 & 0
\end{pmatrix} = \begin{pmatrix}
3 & 0 & 0 \\
0 & 1 & 0
\end{pmatrix}$$

$$\begin{pmatrix}
R_1 - R_1 - R_2
\end{pmatrix}$$

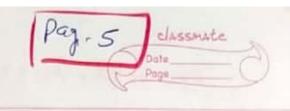
$$\begin{pmatrix}
1 & -1 & -3 \\
5 & 1 & 0
\end{pmatrix} = \begin{pmatrix}
3 & -1 & 0 \\
0 & 1 & 0
\end{pmatrix}$$

$$\begin{bmatrix} 1 & -1 & -3 \\ 5 & 1 & 0 \end{bmatrix} = \begin{bmatrix} 3 & -1 & 0 \\ 0 & 1 & 0 \end{bmatrix} A$$

$$\begin{bmatrix} 0 & 6 & 15 \\ 0 & 6 & 15 \\ 0 & 1 & 3 \end{bmatrix} = \begin{bmatrix} 3 & -1 & 0 \\ -15 & 6 & 0 \\ 0 & 8 & 1 \end{bmatrix} A$$

$$\begin{bmatrix} 1 & -1 & -3 \\ 0 & 1 & 3 \\ 0 & 6 & 15 \end{bmatrix} = \begin{bmatrix} 3 & -1 & 0 \\ 0 & 0 & 1 \\ -15 & 6 & 0 \end{bmatrix} \neq \begin{bmatrix} 3 & -1 & 0 \\ 0 & 6 & 15 \end{bmatrix} = \begin{bmatrix} 3 & -1 & 0 \\ 0 & 1 & 3 \\ 0 & 1 & 15 \end{bmatrix} = \begin{bmatrix} 3 & -1 & 0 \\ 0 & 1 & 15 \\ 0 & 1 & 15 \end{bmatrix} = \begin{bmatrix} 3 & -1 & 0 \\ 0 & 1 & 15 \\ 0 & 1 & 1 \\ 0 &$$

$$\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 3 \end{bmatrix} = \begin{bmatrix} 3 & -1 & 1 \\ 0 & 0 & 1 \end{bmatrix} A$$



$$R_3 \rightarrow -\frac{1}{3}R_3$$

$$\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 3 \\ 0 & 0 & 1 \end{bmatrix} = \begin{bmatrix} 3 & -1 & 1 \\ 0 & 0 & 1 \\ 5 & -2 & 2 \end{bmatrix} A$$

$$A^{-1} = \begin{bmatrix} 3 & -1 & 1 \\ -15 & 6 & -5 \\ 5 & -2 & 2 \end{bmatrix}$$
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### Ons9 + we have A = IA

$$\begin{bmatrix} 0 & 1 & 2 \\ 1 & 2 & 3 \end{bmatrix} = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \end{bmatrix} A$$

$$\begin{bmatrix} 3 & 1 & 1 \end{bmatrix} \begin{bmatrix} 1 & 0 & 0 \\ 0 & 0 & 1 \end{bmatrix} A$$

$$\begin{bmatrix} 1 & 2 & 3 \\ 0 & -5 & -8 \end{bmatrix} = \begin{bmatrix} 0 & 1 & 0 \\ 0 & -3 & 1 \end{bmatrix} A$$

$$R_1 \rightarrow R_1 - 2R_2$$
 and  $R_3 \rightarrow R_3 + 5R_2$ 

$$\begin{bmatrix} 1 & 0 & -1 \\ 0 & 0 & 2 \end{bmatrix} = \begin{bmatrix} -2 & 1 & 0 \\ 1 & 0 & 0 \end{bmatrix} A$$

Parys. 6 Justice

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$$\begin{bmatrix} 1 & 0 & -1 \\ 0 & 1 & 2 \\ 0 & 0 & 1 \end{bmatrix} = \begin{bmatrix} -2 & 1 & 0 \\ 1 & 0 & 0 \\ \frac{5}{2} & -\frac{3}{2} & \frac{1}{2} \end{bmatrix} A$$

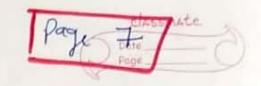
$$= \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix} = \begin{bmatrix} 1/2 & -1/2 & 1/2 \\ -4 & 3 & -1 \\ 5/2 & -3/2 & 1/2 \end{bmatrix}$$

$$A^{-1} = \begin{bmatrix} 1/2 & -1/2 & 1/2 \\ -4 & 3 & -1 \\ 5/2 & -3/2 & 1/2 \end{bmatrix} \underline{Amp}$$

$$\begin{bmatrix} 2 & -1 & 3 \\ 1 & 2 & 4 \end{bmatrix} = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \end{bmatrix} A$$

$$\begin{bmatrix} 1 & 2 & 4 \\ 2 & -1 & 3 \\ 3 & 1 & 1 \end{bmatrix} = \begin{bmatrix} 0 & 1 & 0 \\ 1 & 0 & 0 \end{bmatrix} A$$

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$$\begin{bmatrix} 1 & 0 & 2 \\ 0 & 1 & 1 \end{bmatrix} = \begin{bmatrix} 2/5 & 2/5 & 0 \\ -1/5 & +2/5 & 0 \end{bmatrix} + 1$$

$$= \begin{bmatrix} 1 & 0 & 2 \\ 0 & 1 & 1 \end{bmatrix} = \begin{bmatrix} 2/5 & 1/5 & 0 \\ -1/5 & +2/5 & 0 \\ 1 & 2 & -\frac{1}{6} \end{bmatrix}$$

$$\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix} = \begin{bmatrix} +2/30 & -\frac{9}{30} & \frac{1}{3} \\ -11/30 & 7/30 & \frac{5}{36} \\ 1/6 & 1/6 & \frac{7}{6} \end{bmatrix}$$