matrices : 2×2 , Identity matrix

2. $AB = I$ $\quad B = \begin{pmatrix} 5 & -2 \\ 7 & -3 \end{pmatrix}$ $\quad I = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$

$$ABB^{-1} = IB^{-1} \qquad BB^{-1} = I$$

$$AI = B^{-1}$$

$$A = B^{-1}$$

$$B = \begin{pmatrix} 5 & -2 \\ 7 & -3 \end{pmatrix} \qquad \det B = -15 - (-14)$$

$$\det B = -1$$

$$B^{-1} = \frac{1}{-1}\begin{pmatrix} -3 & 2 \\ -7 & 5 \end{pmatrix}$$

$$B^{-1} = A = \begin{pmatrix} 3 & -2 \\ 7 & -5 \end{pmatrix}$$

check $\quad \begin{pmatrix} 3 & -2 \\ 7 & -5 \end{pmatrix}\begin{pmatrix} 5 & -2 \\ 7 & -3 \end{pmatrix} = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$

✓

Matrices: 2×2, Identity matrix

Q5 $A\begin{pmatrix}5 & -2\\ 3 & -1\end{pmatrix}=\begin{pmatrix}1 & -3\\ 2 & 4\end{pmatrix}$

$$A=\begin{pmatrix}1 & -3\\ 2 & 4\end{pmatrix}\begin{pmatrix}5 & -2\\ 3 & -1\end{pmatrix}^{-1}$$

$$\begin{pmatrix}5 & -2\\ 3 & -1\end{pmatrix}^{-1}=\frac{1}{(-5+6)}\begin{pmatrix}-1 & 2\\ -3 & 5\end{pmatrix}$$

$$=\frac{1}{1}\begin{pmatrix}-1 & 2\\ -3 & 5\end{pmatrix}$$

$$A=\begin{pmatrix}1 & -3\\ 2 & 4\end{pmatrix}\begin{pmatrix}-1 & 2\\ -3 & 5\end{pmatrix}$$

$$A=\begin{pmatrix}8 & -13\\ -14 & 24\end{pmatrix}$$

$$\begin{pmatrix}8 & -13\\ -14 & 24\end{pmatrix}\begin{pmatrix}5 & -2\\ 3 & -1\end{pmatrix}=\begin{pmatrix}1 & -3\\ 2 & 4\end{pmatrix}$$