INVERS

Matriks

Sifat-sifat invers matriks

Tujuan pembelajaran

1. Peserta didik menemukan sifat-sifat invers matriks dan persamaan matriks
2. Peserta didik mampu memecahkan masalah dengan menerapkan invers matriks

1

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

A^{-1}

Invers matriks A

$$A^{-1} = \frac{1}{(3)(4) - (\ \ )(\ \ )} \begin{pmatrix} & \\ & \end{pmatrix}$$

$$= \frac{1}{\ \ } \begin{pmatrix} & \\ & \end{pmatrix} = \begin{pmatrix} & \\ & 1{,}5 \end{pmatrix}$$

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

$$= \begin{pmatrix} (\ \ )(\ \ ) + (\ \ )(\ \ ) & (\ \ )(\ \ ) + (\ \ )(\ \ ) \\ (\ \ )(\ \ ) + (\ \ )(\ \ ) & (\ \ )(\ \ ) + (\ \ )(\ \ ) \end{pmatrix}$$

$$= \begin{pmatrix} & \\ & \end{pmatrix}$$

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

$$= \begin{pmatrix} (\ \ )(\ \ ) + (\ \ )(\ \ ) & (\ \ )(\ \ ) + (\ \ )(\ \ ) \\ (\ \ )(\ \ ) + (\ \ )(\ \ ) & (\ \ )(\ \ ) + (\ \ )(\ \ ) \end{pmatrix}$$

$$= \begin{pmatrix} & \\ & \end{pmatrix}$$

Jadi, $A^{-1}A$ AA^{-1}

2

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

Dihalaman sebelumnya sudah ditemukan, Invers A

$$A^{-1} = \begin{pmatrix} & \\ & 1{,}5 \end{pmatrix}$$

Tentukan $(A^{-1})^{-1}$

$$(A^{-1})^{-1} = \begin{pmatrix} & \\ & 1{,}5 \end{pmatrix}^{-1}$$

$$= \frac{1}{(\ )(\ ) - (\ )(\ )} \begin{pmatrix} 1{,}5 & \\ & \end{pmatrix}$$

$$= \frac{1}{\quad} \begin{pmatrix} 1{,}5 & \\ & \end{pmatrix} = \begin{pmatrix} 1{,}5 & \\ & \end{pmatrix}$$

$$= \begin{pmatrix} & \\ & \end{pmatrix}$$

$Jadi, (A^{-1})^{-1} =$

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

DETERMINAN A

|A| = ( )( ) - ( )( )

= -

=

DETERMINAN A^{-1}

Dihalaman sebelumnya sudah ditemukan, Invers A

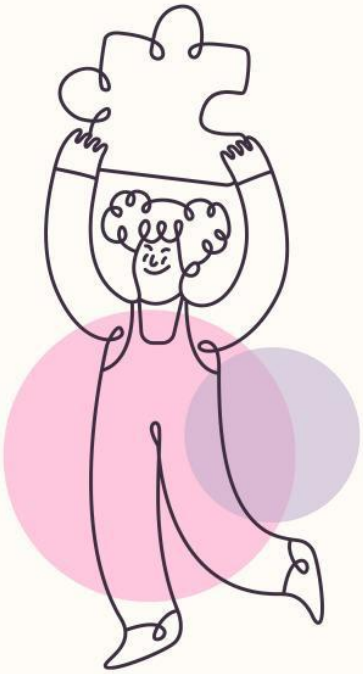
$$A^{-1} = \begin{pmatrix} & \\ & 1{,}5 \end{pmatrix}$$

Maka determinan A^{-1}, sebagai berikut:

$|A^{-1}|$ = ( )( ) - ( )( )

= -

=



Jadi, det $A^{-1} = \frac{1}{\quad}$

4

Diketahui $A = \begin{pmatrix} 3 & 2 \\ 5 & 4 \end{pmatrix}$ dan $B = \begin{pmatrix} 5 & 9 \\ 4 & 7 \end{pmatrix}$

Tentukan $(AB)^{-1}$

Cari dulu AB

$$AB = \begin{pmatrix} 3 & 2 \\ 5 & 4 \end{pmatrix}\begin{pmatrix} 5 & 9 \\ 4 & 7 \end{pmatrix}$$

$$= \begin{pmatrix} (\quad)(\quad)+(\quad)(\quad) & (\quad)(\quad)+(\quad)(\quad) \\ (\quad)(\quad)+(\quad)(\quad) & (\quad)(\quad)+(\quad)(\quad) \end{pmatrix} = \begin{pmatrix} \quad & \quad \\ \quad & \quad \end{pmatrix}$$

Lalu cari

$$(AB)^{-1} = \frac{1}{(\quad)(\quad)-(\quad)(\quad)}\begin{pmatrix} \quad & \quad \\ \quad & \quad \end{pmatrix}$$

$$= \frac{1}{\quad}\begin{pmatrix} \quad & \quad \\ \quad & \quad \end{pmatrix} = \begin{pmatrix} \quad & \quad \\ \quad & \quad \end{pmatrix}$$

Tentukan $B^{-1}\ A^{-1}$

DIHALAMAN 2 SUDAH DICARI NILAI INVERS MATRIKS A YAITU

$$A^{-1} = \begin{pmatrix} \quad & \quad \\ 1{,}5 & \quad \end{pmatrix}$$

CARI INVERS MATRIKS B

$$B^{-1} = \frac{1}{(\quad)(\quad)-(\quad)(\quad)}\begin{pmatrix} \quad & \quad \\ \quad & \quad \end{pmatrix} = \begin{pmatrix} \quad & \quad \\ \quad & \quad \end{pmatrix}$$

$$B^{-1}\ A^{-1} = \begin{pmatrix} \quad & \quad \\ \quad & \quad \end{pmatrix}\begin{pmatrix} \quad & \quad \\ 1{,}5 & \quad \end{pmatrix}$$

$$= \begin{pmatrix} (\quad)(\quad)+(\quad)(\quad) & (\quad)(\quad)+(\quad)(\quad) \\ (\quad)(\quad)+(\quad)(\quad) & (\quad)(\quad)+(\quad)(\quad) \end{pmatrix} = \begin{pmatrix} \quad & \quad \\ \quad & \quad \end{pmatrix}$$

Jadi, $(AB)^{-1}$ $\quad$ $B^{-1}\ A^{-1}$

SEMANGAT

Lanjut ya...

Persamaan matriks

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PERSAMAAN MATRIKS

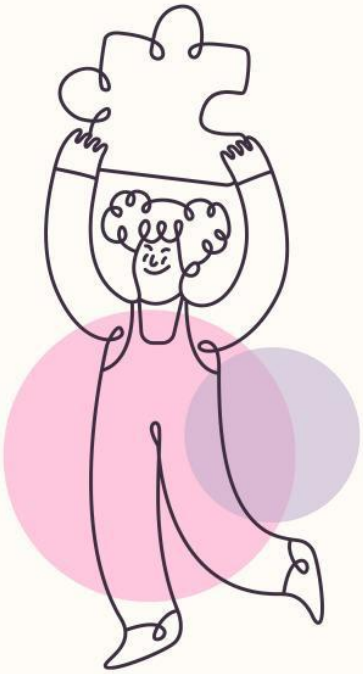
Jika $AX=B$

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

$X=A^{-1}B$

$X=A^{-1}B$

Jadi, Jika Maka $X = A^{-1}B$



Jika $XA=B$

Maka $XAA^{-1}=BA^{-1}$

$X=BA^{-1}$

$X=BA^{-1}$

Jadi, Jika Maka $X = BA^{-1}$

6

CONTOH SOAL

Tentukan X supaya $\begin{pmatrix} 2 & 3 \\ 3 & 5 \end{pmatrix} X = \begin{pmatrix} 6 \\ 4 \end{pmatrix}$

Ingat $AX=B$ *Maka* $X=A^{-1}B$

$$\begin{pmatrix} 2 & 3 \\ 3 & 5 \end{pmatrix} X = \begin{pmatrix} 6 \\ 4 \end{pmatrix}$$

$$X = \begin{pmatrix} 2 & 3 \\ 3 & 5 \end{pmatrix}^{-1} \begin{pmatrix} 6 \\ 4 \end{pmatrix}$$

$$X = \frac{1}{(\ )(\ ) - (\ )(\ )} \begin{pmatrix} & \\ & \end{pmatrix} \begin{pmatrix} 6 \\ 4 \end{pmatrix}$$

$$X = \begin{pmatrix} & \\ & \end{pmatrix} \begin{pmatrix} 6 \\ 4 \end{pmatrix} = \begin{pmatrix} (\ )(\ ) + (\ )(\ ) \\ (\ )(\ ) + (\ )(\ ) \end{pmatrix}$$

$$X = \begin{pmatrix} & \\ & \end{pmatrix}$$

Bukti

$$\begin{pmatrix} 2 & 3 \\ 3 & 5 \end{pmatrix} X = \begin{pmatrix} 6 \\ 4 \end{pmatrix}$$

$$\begin{pmatrix} 2 & 3 \\ 3 & 5 \end{pmatrix} \begin{pmatrix} & \\ & \end{pmatrix} = \begin{pmatrix} 6 \\ 4 \end{pmatrix}$$

$$\begin{pmatrix} (\ )(\ ) + (\ )(\ ) \\ (\ )(\ ) + (\ )(\ ) \end{pmatrix} = \begin{pmatrix} 6 \\ 4 \end{pmatrix}$$

$$\begin{pmatrix} & \\ & \end{pmatrix} = \begin{pmatrix} 6 \\ 4 \end{pmatrix}$$