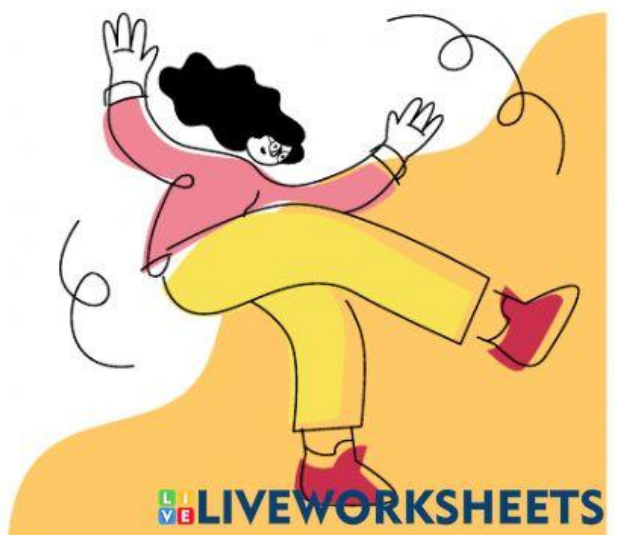




LEMBAR KERJA PESERTA DIDIK (LKPD)

INVERS MATRIKS

KELAS XI





Petunjuk pengisian LKPD:

1. Pelajari materi Invers Matriks yang telah dibagikan melalui *Google Classroom*
2. Bacalah persoalan dengan cermat
3. Tanyakan pada guru apabila mendapat kesulitan dalam mengerjakan LKPD
4. Tuliskan jawabanmu pada kotak () yang tersedia
5. Setelah selesai mengerjakan LKPD jangan lupa klik finish dan kirim jawabanmu lewat email guru

Nama :

Kelas :

NIS :

Selesaikan persoalan berikut!

1. Invers dari matriks $A = \begin{pmatrix} 3 & 8 \\ 0 & 2 \end{pmatrix}$ adalah ...

Penyelesaian :

$$\begin{aligned} \det(A) &= (\square)(\square) - (\square)(\square) \\ &= \square - \square \\ &= \square \end{aligned}$$

$$\begin{aligned} A^{-1} &= \frac{1}{\det(A)} \begin{pmatrix} d & -b \\ -c & a \end{pmatrix} \\ &= \frac{1}{\square} \begin{pmatrix} \square & \square \\ \square & \square \end{pmatrix} \\ &= \begin{pmatrix} \square & \square \\ \square & \square \end{pmatrix} \end{aligned}$$

2. Tentukan nilai x dan y dari sistem persamaan linear berikut

$$\begin{cases} 2x + 3y = 8 \\ 3x - 2y = -1 \end{cases}$$

Penyelesaian :

Susun SPLDV di atas ke dalam bentuk matriks.

$$\begin{pmatrix} 2 & 3 \\ 3 & -2 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 8 \\ -1 \end{pmatrix}$$

Gunakan sifat invers matriks:

$$AX = B \rightarrow X = A^{-1}B$$

Maka :

$$\begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 2 & 3 \\ \square & -2 \end{pmatrix}^{-1} \begin{pmatrix} 8 \\ -1 \end{pmatrix}$$

$$\begin{pmatrix} x \\ y \end{pmatrix} = \frac{1}{\begin{pmatrix} \square \end{pmatrix} \begin{pmatrix} \square \end{pmatrix} - \begin{pmatrix} \square \end{pmatrix} \begin{pmatrix} \square \end{pmatrix}} \begin{pmatrix} \square & \square \\ \square & \square \end{pmatrix} \begin{pmatrix} \square \\ \square \end{pmatrix}$$

$$\begin{pmatrix} x \\ y \end{pmatrix} = \frac{1}{\square} \left(\begin{pmatrix} \square \end{pmatrix} \begin{pmatrix} \square \end{pmatrix} + \begin{pmatrix} \square \end{pmatrix} \begin{pmatrix} \square \end{pmatrix} \right)$$

$$\begin{pmatrix} x \\ y \end{pmatrix} = \frac{1}{\square} \begin{pmatrix} \square \\ \square \end{pmatrix}$$

$$\begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} \square \\ \square \end{pmatrix}$$

Jadi nilai $x = \square$ dan $y = \square$

3. Tentukan invers dari matriks A berikut

$$A = \begin{pmatrix} 3 & 1 & 0 \\ 2 & 1 & 1 \\ 6 & 2 & 2 \end{pmatrix}$$

Penyelesaian :

Menentukan semua minor dari matriks A terlebih dahulu:

$$M_{11} = \begin{vmatrix} 1 & 1 \\ 2 & 2 \end{vmatrix} = 2 - 2 = 0$$

$$M_{12} = \begin{vmatrix} 2 & 1 \\ 6 & 2 \end{vmatrix} = 4 - 6 = -2$$

$$M_{13} = \begin{vmatrix} \square & \square \\ \square & \square \end{vmatrix} = 4 - 6 = -2$$

$$M_{21} = \begin{vmatrix} \square & \square \\ \square & \square \end{vmatrix} = \square - \square = \square$$

$$M_{22} = \begin{vmatrix} \square & \square \\ \square & \square \end{vmatrix} = \square - \square = \square$$



$$M_{23} = \begin{vmatrix} \blacksquare & \blacksquare \\ \blacksquare & \blacksquare \end{vmatrix} = \blacksquare - \blacksquare = \blacksquare$$

$$M_{31} = \begin{vmatrix} \blacksquare & \blacksquare \\ \blacksquare & \blacksquare \end{vmatrix} = \blacksquare - \blacksquare = \blacksquare$$

$$M_{32} = \begin{vmatrix} \blacksquare & \blacksquare \\ \blacksquare & \blacksquare \end{vmatrix} = \blacksquare - \blacksquare = \blacksquare$$

$$M_{33} = \begin{vmatrix} \blacksquare & \blacksquare \\ \blacksquare & \blacksquare \end{vmatrix} = \blacksquare - \blacksquare = \blacksquare$$

Sehingga diperoleh kofaktor dari A yaitu

$$\text{kof}(A) = \begin{pmatrix} +M_{11} & -M_{12} & +M_{13} \\ -M_{21} & +M_{22} & -M_{23} \\ +M_{31} & -M_{32} & +M_{33} \end{pmatrix}$$

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

Adjoin dari A adalah tranpose dari matriks kofaktornya, yaitu

$$\text{adj}(A) = \begin{pmatrix} \blacksquare & \blacksquare & \blacksquare \\ \blacksquare & \blacksquare & \blacksquare \\ \blacksquare & \blacksquare & \blacksquare \end{pmatrix}$$

Determinan dari matriks A dapat ditentukan dengan banyak cara. Kali ini, akan digunakan ekspansi kofaktor sepanjang baris pertama:

$$\begin{aligned} \det(A) &= 3 \begin{vmatrix} \blacksquare & \blacksquare \\ \blacksquare & \blacksquare \end{vmatrix} - 1 \begin{vmatrix} \blacksquare & \blacksquare \\ \blacksquare & \blacksquare \end{vmatrix} + 0 \\ &= 3(\blacksquare - \blacksquare) - 1(\blacksquare - \blacksquare) \\ &= \blacksquare \end{aligned}$$



Sehingga invers dari matriks A adalah

$$\begin{aligned}
 A^{-1} &= \frac{1}{\det(A)} \text{adj}(A) \\
 &= \frac{1}{\text{blue square}} \begin{pmatrix} \text{blue square} & \text{blue square} & \text{blue square} \\ \text{blue square} & \text{blue square} & \text{blue square} \\ \text{blue square} & \text{blue square} & \text{blue square} \end{pmatrix} \\
 &= \begin{pmatrix} \text{blue square} & \text{blue square} & \text{blue square} \\ \text{blue square} & \text{blue square} & \text{blue square} \\ \text{blue square} & \text{blue square} & \text{blue square} \end{pmatrix}
 \end{aligned}$$