



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:

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

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

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

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

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

mn

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

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

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

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

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

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