

$$4X + \begin{bmatrix} 2 & 1 \\ 1 & 1 \end{bmatrix} \cdot X = \begin{bmatrix} 1 & 3 \\ -1 & 1 \end{bmatrix}$$

$$4 \cdot X + \begin{bmatrix} 2 & 1 \\ 1 & 1 \end{bmatrix} X = \begin{bmatrix} 1 & 3 \\ -1 & 1 \end{bmatrix}$$

$$\begin{bmatrix} 4 & 0 \\ 0 & 4 \end{bmatrix} \cdot X + \begin{bmatrix} 2 & 1 \\ 1 & 1 \end{bmatrix} X = \begin{bmatrix} 1 & 3 \\ -1 & 1 \end{bmatrix}$$

$$\left(\begin{bmatrix} 4 & 0 \\ 0 & 4 \end{bmatrix} + \begin{bmatrix} 2 & 1 \\ 1 & 1 \end{bmatrix} \right) X = \begin{bmatrix} 1 & 3 \\ -1 & 1 \end{bmatrix}$$

$$\begin{bmatrix} 6 & 1 \\ 1 & 5 \end{bmatrix} X = \begin{bmatrix} 1 & 3 \\ -1 & 1 \end{bmatrix} \quad \parallel \text{LEFT SIDE} \cdot \begin{bmatrix} 6 & 1 \\ 1 & 5 \end{bmatrix}^{-1}$$

$$\begin{bmatrix} 6 & 1 \\ 1 & 5 \end{bmatrix}^{-1} = \frac{1}{29} \begin{bmatrix} 5 & -1 \\ -1 & 6 \end{bmatrix}$$

First of all we must multiply $4X$ by identity matrix ($\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$).

Next we must put the matrix X behind the bracket on the right side. And we must add the matrices in the bracket.

Then we multiply both sides by the inverse matrix $\begin{bmatrix} 5 & -1 \\ -1 & 6 \end{bmatrix}$.

In the next step we calculate the inverse matrix. We should use the formula: $\begin{bmatrix} a & c \\ b & d \end{bmatrix}^{-1} = \frac{1}{\det A} \begin{bmatrix} d & -b \\ -c & a \end{bmatrix}$

a) First we calculate $\det A$. (So we must multiply a by d and next subtract $(-b)$ multiplied by $(-c)$).

b) Then we calculate 1 divided by $\det A$ and multiply by matrix $\begin{bmatrix} d & -b \\ -c & a \end{bmatrix}$. (When we use a formula we must change a place the d and a , and we change a sign of c and b from "+" to "-").

$$X = \begin{bmatrix} 6 & 1 \\ 1 & 5 \end{bmatrix}^{-1} \cdot \begin{bmatrix} 1 & 3 \\ -1 & 1 \end{bmatrix}$$

$$X = \frac{1}{29} \cdot \begin{bmatrix} 5 & -1 \\ -1 & 6 \end{bmatrix} \cdot \begin{bmatrix} 1 & 3 \\ -1 & 1 \end{bmatrix}$$

First of all we must multiply 5 by 1 and we add -1 multiplied by -1 .

We multiply 5 by 3 and we add -1 multiplied by 1 .

We multiply -1 by 1 and we add 6 multiplied by -1 .

We multiply -1 by 3 and we add 6 multiplied by 1 .

$$X = \frac{1}{29} \begin{bmatrix} 6 & 14 \\ -7 & 3 \end{bmatrix}$$

$$X = \begin{bmatrix} \frac{6}{29} & \frac{14}{29} \\ -\frac{7}{29} & \frac{3}{29} \end{bmatrix}$$

We get a result of our equation.