$X \cdot \begin{bmatrix} 2 & 5 \\ 1 & 3 \end{bmatrix} = \begin{bmatrix} 4 & -6 \\ 2 & 1 \end{bmatrix} \quad // _{\text{RIGHT SIDE}} \begin{bmatrix} 2 & 5 \\ 1 & 3 \end{bmatrix}^{-1}$

First of all we multiply both sides by the inverse matrix of $\begin{bmatrix} 2 & 5 \\ 1 & 3 \end{bmatrix}$.

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

In the next step we calculate the inverse matrix. We should use the formula:

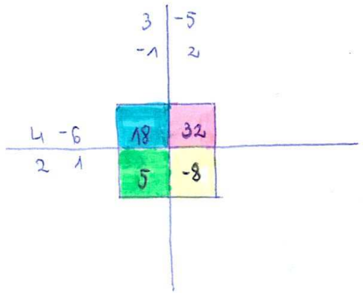
$\begin{bmatrix} a & c \\ b & d \end{bmatrix}^{-1} = \frac{1}{\det A} \cdot \begin{bmatrix} d & -b \\ -c & a \end{bmatrix}$ a) First we calculate det A (so we must multiply a by d and next subtract (-b) multiplied by (-c).

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 "–").

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

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

When we calculate the inverse matrix we must multiply it by a matrix which stands on the left side of this matrix.



- First of all we must multiply 4 by 3 and we add -6 multiplied by -1.
- We multiply 4 by -5 and we add -6 multiplied by 2.
- We multiply 2 by 3 and we add 1 multiplied by -1.
- We multiply 2 by -5 and we add 1 multiplied by 2.

$X = \begin{bmatrix} 18 & 32 \\ 5 & -8 \end{bmatrix}$

We get a result of our equation.

EPM I Aleksandra Lis.