

Eliminacja Gaussa - Przykład

$$\begin{array}{rcl} x_1 + 2x_2 + x_3 & = & 0 \quad E(1) \\ 2x_1 + 2x_2 + 3x_3 & = & 3 \quad E(2) \\ -x_1 - 3x_2 & = & 2 \quad E(3) \end{array}$$

$$E'(1) = E(1), \quad E'(2) = E(2) - 2E(1), \quad E'(3) = E(3) + E(1)$$

$$\begin{array}{rcl} x_1 + 2x_2 + x_3 & = & 0 \quad E(1)' \\ -2x_2 + x_3 & = & 3 \quad E(2)' \\ -x_2 + x_3 & = & 2 \quad E(3)' \end{array}$$

$$E''(1) = E'(1), \quad E''(2) = E'(2), \quad E(3)'' = E(3)' - \frac{1}{2}E(2)'$$

$$\begin{array}{rcl} x_1 + 2x_2 + x_3 & = & 0 \quad E(1)'' \\ -2x_2 + x_3 & = & 3 \quad E(2)'' \\ \frac{1}{2}x_3 & = & \frac{1}{2} \quad E(3)'' \end{array}$$

Po rozwiązaniu (od tyłu)

$$\begin{aligned} x_3 &= 1 \\ -2x_2 + 1 &= 3 \\ x_2 &= -1 \\ \therefore x_1 + 2(-1) + 1 &= 0 \\ x_1 &= 1 \end{aligned}$$

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$$\begin{array}{rcl} a_{11}x_1 + a_{12}x_2 + a_{13}x_3 & = & b_1 \quad E(1) \\ a_{21}x_1 + a_{22}x_2 + a_{23}x_3 & = & b_2 \quad E(2) \\ a_{31}x_1 + a_{32}x_2 + a_{33}x_3 & = & b_3 \quad E(3) \end{array}$$

$$E(1)' = E(1), \quad E(2)' = E(2) - m_{21}E(1), \quad E(3)' = E(3) - m_{31}E(1)$$

$$m_{21} = \frac{a_{21}}{a_{11}}, \quad m_{31} = \frac{a_{31}}{a_{11}}$$