

# Sustavi linearnih jednadžbi. Gaussov postupak

MATEMATIKA ZA EKONOMISTE 1

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Damir Horvat

FOI, Varaždin

# Sadržaj

prvi zadatak

drugi zadatak

treći zadatak

četvrti zadatak

**prvi zadatak**

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# Sustavi linearnih jednažbi

## Zadatak 1

*Riješite sustav linearnih jednažbi*

$$2x - y + 2z = 1$$

$$x - 3y + z = 2.$$

$$4x - 2y + 3z = -4$$

## Rješenje pomoću inverzne matrice

$$2x - y + 2z = 1$$

$$x - 3y + z = 2$$

$$4x - 2y + 3z = -4$$

## Rješenje pomoću inverzne matrice

$A =$

$$2x - y + 2z = 1$$

$$x - 3y + z = 2$$

$$4x - 2y + 3z = -4$$

**Rješenje** pomoću inverzne matrice

$$A = \begin{bmatrix} & & \\ & & \\ & & \end{bmatrix}$$

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$

**Rješenje** pomoću inverzne matrice

$$A = \begin{bmatrix} 2 & -1 & 2 \\ 1 & -3 & 1 \\ 4 & -2 & 3 \end{bmatrix}$$

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$



**Rješenje** pomoću inverzne matrice

$$A = \begin{bmatrix} 2 & -1 & 2 \\ 1 & -3 & 1 \end{bmatrix}$$

$$2x - y + 2z = 1$$

$$x - 3y + z = 2$$

$$4x - 2y + 3z = -4$$

**Rješenje** pomoću inverzne matrice

$$A = \begin{bmatrix} 2 & -1 & 2 \\ 1 & -3 & 1 \\ 4 & -2 & 3 \end{bmatrix}$$

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$

**Rješenje** pomoću inverzne matrice

$$A = \begin{bmatrix} 2 & -1 & 2 \\ 1 & -3 & 1 \\ 4 & -2 & 3 \end{bmatrix} \quad X =$$

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$

## Rješenje pomoću inverzne matrice

$$A = \begin{bmatrix} 2 & -1 & 2 \\ 1 & -3 & 1 \\ 4 & -2 & 3 \end{bmatrix} \quad X = \begin{bmatrix} x \\ y \\ z \end{bmatrix}$$

$$2x - y + 2z = 1$$

$$x - 3y + z = 2$$

$$4x - 2y + 3z = -4$$

**Rješenje** pomoću inverzne matrice

$$A = \begin{bmatrix} 2 & -1 & 2 \\ 1 & -3 & 1 \\ 4 & -2 & 3 \end{bmatrix} \quad X = \begin{bmatrix} x \\ y \\ z \end{bmatrix} \quad B =$$

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$

## Rješenje pomoću inverzne matrice

$$A = \begin{bmatrix} 2 & -1 & 2 \\ 1 & -3 & 1 \\ 4 & -2 & 3 \end{bmatrix} \quad X = \begin{bmatrix} x \\ y \\ z \end{bmatrix} \quad B = \begin{bmatrix} 1 \\ 2 \\ -4 \end{bmatrix}$$

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$

## Rješenje pomoću inverzne matrice

$$A = \begin{bmatrix} 2 & -1 & 2 \\ 1 & -3 & 1 \\ 4 & -2 & 3 \end{bmatrix} \quad X = \begin{bmatrix} x \\ y \\ z \end{bmatrix} \quad B = \begin{bmatrix} 1 \\ 2 \\ -4 \end{bmatrix}$$

$$AX = B$$

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$

## Rješenje pomoću inverzne matrice

$$A = \begin{bmatrix} 2 & -1 & 2 \\ 1 & -3 & 1 \\ 4 & -2 & 3 \end{bmatrix} \quad X = \begin{bmatrix} x \\ y \\ z \end{bmatrix} \quad B = \begin{bmatrix} 1 \\ 2 \\ -4 \end{bmatrix}$$

$$AX = B$$

$$X = A^{-1}B$$

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$



## Rješenje pomoću inverzne matrice

$$A = \begin{bmatrix} 2 & -1 & 2 \\ 1 & -3 & 1 \\ 4 & -2 & 3 \end{bmatrix} \quad X = \begin{bmatrix} x \\ y \\ z \end{bmatrix} \quad B = \begin{bmatrix} 1 \\ 2 \\ -4 \end{bmatrix}$$

$$AX = B$$

$$X = A^{-1}B$$

$$A^{-1} =$$

## Rješenje pomoću inverzne matrice

$$A = \begin{bmatrix} 2 & -1 & 2 \\ 1 & -3 & 1 \\ 4 & -2 & 3 \end{bmatrix} \quad X = \begin{bmatrix} x \\ y \\ z \end{bmatrix} \quad B = \begin{bmatrix} 1 \\ 2 \\ -4 \end{bmatrix}$$

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

$$\boxed{DZ} \quad A^{-1} = \frac{1}{5} \begin{bmatrix} -7 & -1 & 5 \\ 1 & -2 & 0 \\ 10 & 0 & -5 \end{bmatrix}$$

## Rješenje pomoću inverzne matrice

$$A = \begin{bmatrix} 2 & -1 & 2 \\ 1 & -3 & 1 \\ 4 & -2 & 3 \end{bmatrix} \quad X = \begin{bmatrix} x \\ y \\ z \end{bmatrix} \quad B = \begin{bmatrix} 1 \\ 2 \\ -4 \end{bmatrix}$$

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

$$A^{-1} = \frac{1}{5} \begin{bmatrix} -7 & -1 & 5 \\ 1 & -2 & 0 \\ 10 & 0 & -5 \end{bmatrix}$$

$$X =$$

## Rješenje pomoću inverzne matrice

$$A = \begin{bmatrix} 2 & -1 & 2 \\ 1 & -3 & 1 \\ 4 & -2 & 3 \end{bmatrix} \quad X = \begin{bmatrix} x \\ y \\ z \end{bmatrix} \quad B = \begin{bmatrix} 1 \\ 2 \\ -4 \end{bmatrix}$$

$$AX = B$$

$$X = A^{-1}B$$

$$X = \frac{1}{5} \begin{bmatrix} -7 & -1 & 5 \\ 1 & -2 & 0 \\ 10 & 0 & -5 \end{bmatrix}$$

DZ

$$A^{-1} = \frac{1}{5} \begin{bmatrix} -7 & -1 & 5 \\ 1 & -2 & 0 \\ 10 & 0 & -5 \end{bmatrix}$$

## Rješenje pomoću inverzne matrice

$$A = \begin{bmatrix} 2 & -1 & 2 \\ 1 & -3 & 1 \\ 4 & -2 & 3 \end{bmatrix} \quad X = \begin{bmatrix} x \\ y \\ z \end{bmatrix} \quad B = \begin{bmatrix} 1 \\ 2 \\ -4 \end{bmatrix}$$

$$AX = B$$

$$X = A^{-1}B$$

$$X = \frac{1}{5} \begin{bmatrix} -7 & -1 & 5 \\ 1 & -2 & 0 \\ 10 & 0 & -5 \end{bmatrix} \begin{bmatrix} 1 \\ 2 \\ -4 \end{bmatrix}$$

DZ

$$A^{-1} = \frac{1}{5} \begin{bmatrix} -7 & -1 & 5 \\ 1 & -2 & 0 \\ 10 & 0 & -5 \end{bmatrix}$$

## Rješenje pomoću inverzne matrice

$$A = \begin{bmatrix} 2 & -1 & 2 \\ 1 & -3 & 1 \\ 4 & -2 & 3 \end{bmatrix} \quad X = \begin{bmatrix} x \\ y \\ z \end{bmatrix} \quad B = \begin{bmatrix} 1 \\ 2 \\ -4 \end{bmatrix}$$

$$AX = B$$

$$X = A^{-1}B$$

$$X = \frac{1}{5} \begin{bmatrix} -7 & -1 & 5 \\ 1 & -2 & 0 \\ 10 & 0 & -5 \end{bmatrix} \begin{bmatrix} 1 \\ 2 \\ -4 \end{bmatrix}$$

DZ

$$A^{-1} = \frac{1}{5} \begin{bmatrix} -7 & -1 & 5 \\ 1 & -2 & 0 \\ 10 & 0 & -5 \end{bmatrix}$$

$$X =$$

## Rješenje pomoću inverzne matrice

$$A = \begin{bmatrix} 2 & -1 & 2 \\ 1 & -3 & 1 \\ 4 & -2 & 3 \end{bmatrix} \quad X = \begin{bmatrix} x \\ y \\ z \end{bmatrix} \quad B = \begin{bmatrix} 1 \\ 2 \\ -4 \end{bmatrix}$$

$$AX = B$$

$$X = A^{-1}B$$

$$X = \frac{1}{5} \begin{bmatrix} -7 & -1 & 5 \\ 1 & -2 & 0 \\ 10 & 0 & -5 \end{bmatrix} \begin{bmatrix} 1 \\ 2 \\ -4 \end{bmatrix}$$

$$X = \frac{1}{5} \begin{bmatrix} \phantom{0} \\ \phantom{0} \\ \phantom{0} \end{bmatrix}$$

DZ

$$A^{-1} = \frac{1}{5} \begin{bmatrix} -7 & -1 & 5 \\ 1 & -2 & 0 \\ 10 & 0 & -5 \end{bmatrix}$$

## Rješenje pomoću inverzne matrice

$$A = \begin{bmatrix} 2 & -1 & 2 \\ 1 & -3 & 1 \\ 4 & -2 & 3 \end{bmatrix} \quad X = \begin{bmatrix} x \\ y \\ z \end{bmatrix} \quad B = \begin{bmatrix} 1 \\ 2 \\ -4 \end{bmatrix}$$

$$AX = B$$

$$X = A^{-1}B$$

$$X = \frac{1}{5} \begin{bmatrix} -7 & -1 & 5 \\ 1 & -2 & 0 \\ 10 & 0 & -5 \end{bmatrix} \begin{bmatrix} 1 \\ 2 \\ -4 \end{bmatrix}$$

$$X = \frac{1}{5} \begin{bmatrix} -29 \\ \phantom{0} \\ \phantom{0} \end{bmatrix}$$

DZ

$$A^{-1} = \frac{1}{5} \begin{bmatrix} -7 & -1 & 5 \\ 1 & -2 & 0 \\ 10 & 0 & -5 \end{bmatrix}$$



## Rješenje pomoću inverzne matrice

$$A = \begin{bmatrix} 2 & -1 & 2 \\ 1 & -3 & 1 \\ 4 & -2 & 3 \end{bmatrix} \quad X = \begin{bmatrix} x \\ y \\ z \end{bmatrix} \quad B = \begin{bmatrix} 1 \\ 2 \\ -4 \end{bmatrix}$$

$$AX = B$$

$$X = A^{-1}B$$

$$X = \frac{1}{5} \begin{bmatrix} -7 & -1 & 5 \\ 1 & -2 & 0 \\ 10 & 0 & -5 \end{bmatrix} \begin{bmatrix} 1 \\ 2 \\ -4 \end{bmatrix}$$

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

DZ

$$A^{-1} = \frac{1}{5} \begin{bmatrix} -7 & -1 & 5 \\ 1 & -2 & 0 \\ 10 & 0 & -5 \end{bmatrix}$$

## Rješenje pomoću inverzne matrice

$$A = \begin{bmatrix} 2 & -1 & 2 \\ 1 & -3 & 1 \\ 4 & -2 & 3 \end{bmatrix} \quad X = \begin{bmatrix} x \\ y \\ z \end{bmatrix} \quad B = \begin{bmatrix} 1 \\ 2 \\ -4 \end{bmatrix}$$

$$AX = B$$

$$X = A^{-1}B$$

$$X = \frac{1}{5} \begin{bmatrix} -7 & -1 & 5 \\ 1 & -2 & 0 \\ 10 & 0 & -5 \end{bmatrix} \begin{bmatrix} 1 \\ 2 \\ -4 \end{bmatrix}$$

$$X = \frac{1}{5} \begin{bmatrix} -29 \\ -3 \\ 30 \end{bmatrix}$$

DZ

$$A^{-1} = \frac{1}{5} \begin{bmatrix} -7 & -1 & 5 \\ 1 & -2 & 0 \\ 10 & 0 & -5 \end{bmatrix}$$

## Rješenje pomoću inverzne matrice

$$A = \begin{bmatrix} 2 & -1 & 2 \\ 1 & -3 & 1 \\ 4 & -2 & 3 \end{bmatrix} \quad X = \begin{bmatrix} x \\ y \\ z \end{bmatrix} \quad B = \begin{bmatrix} 1 \\ 2 \\ -4 \end{bmatrix}$$

$$AX = B$$

$$X = A^{-1}B$$

$$X = \frac{1}{5} \begin{bmatrix} -7 & -1 & 5 \\ 1 & -2 & 0 \\ 10 & 0 & -5 \end{bmatrix} \begin{bmatrix} 1 \\ 2 \\ -4 \end{bmatrix}$$

$$X = \frac{1}{5} \begin{bmatrix} -29 \\ -3 \\ 30 \end{bmatrix}$$

DZ

$$A^{-1} = \frac{1}{5} \begin{bmatrix} -7 & -1 & 5 \\ 1 & -2 & 0 \\ 10 & 0 & -5 \end{bmatrix}$$

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

## Rješenje pomoću inverzne matrice

$$A = \begin{bmatrix} 2 & -1 & 2 \\ 1 & -3 & 1 \\ 4 & -2 & 3 \end{bmatrix} \quad X = \begin{bmatrix} x \\ y \\ z \end{bmatrix} \quad B = \begin{bmatrix} 1 \\ 2 \\ -4 \end{bmatrix}$$

$$AX = B$$

$$X = A^{-1}B$$

$$X = \frac{1}{5} \begin{bmatrix} -7 & -1 & 5 \\ 1 & -2 & 0 \\ 10 & 0 & -5 \end{bmatrix} \begin{bmatrix} 1 \\ 2 \\ -4 \end{bmatrix}$$

$$X = \frac{1}{5} \begin{bmatrix} -29 \\ -3 \\ 30 \end{bmatrix}$$

DZ

$$A^{-1} = \frac{1}{5} \begin{bmatrix} -7 & -1 & 5 \\ 1 & -2 & 0 \\ 10 & 0 & -5 \end{bmatrix}$$

$$X = \begin{bmatrix} -\frac{29}{5} \\ -\frac{3}{5} \\ 6 \end{bmatrix} \quad x = -\frac{29}{5}$$

## Rješenje pomoću inverzne matrice

$$A = \begin{bmatrix} 2 & -1 & 2 \\ 1 & -3 & 1 \\ 4 & -2 & 3 \end{bmatrix} \quad X = \begin{bmatrix} x \\ y \\ z \end{bmatrix} \quad B = \begin{bmatrix} 1 \\ 2 \\ -4 \end{bmatrix}$$

$$AX = B$$

$$X = A^{-1}B$$

$$X = \frac{1}{5} \begin{bmatrix} -7 & -1 & 5 \\ 1 & -2 & 0 \\ 10 & 0 & -5 \end{bmatrix} \begin{bmatrix} 1 \\ 2 \\ -4 \end{bmatrix}$$

$$X = \frac{1}{5} \begin{bmatrix} -29 \\ -3 \\ 30 \end{bmatrix}$$

DZ

$$A^{-1} = \frac{1}{5} \begin{bmatrix} -7 & -1 & 5 \\ 1 & -2 & 0 \\ 10 & 0 & -5 \end{bmatrix}$$

$$X = \begin{bmatrix} -\frac{29}{5} \\ -\frac{3}{5} \\ 6 \end{bmatrix} \quad \begin{aligned} x &= -\frac{29}{5} \\ y &= -\frac{3}{5} \end{aligned}$$

## Rješenje pomoću inverzne matrice

$$A = \begin{bmatrix} 2 & -1 & 2 \\ 1 & -3 & 1 \\ 4 & -2 & 3 \end{bmatrix} \quad X = \begin{bmatrix} x \\ y \\ z \end{bmatrix} \quad B = \begin{bmatrix} 1 \\ 2 \\ -4 \end{bmatrix}$$

$$AX = B$$

$$X = A^{-1}B$$

$$X = \frac{1}{5} \begin{bmatrix} -7 & -1 & 5 \\ 1 & -2 & 0 \\ 10 & 0 & -5 \end{bmatrix} \begin{bmatrix} 1 \\ 2 \\ -4 \end{bmatrix}$$

$$X = \frac{1}{5} \begin{bmatrix} -29 \\ -3 \\ 30 \end{bmatrix}$$

DZ

$$A^{-1} = \frac{1}{5} \begin{bmatrix} -7 & -1 & 5 \\ 1 & -2 & 0 \\ 10 & 0 & -5 \end{bmatrix}$$

$$X = \begin{bmatrix} -\frac{29}{5} \\ -\frac{3}{5} \\ 6 \end{bmatrix} \quad \begin{aligned} x &= -\frac{29}{5} \\ y &= -\frac{3}{5} \\ z &= 6 \end{aligned}$$

## Cramerovo pravilo

$$2x - y + 2z = 1$$

$$x - 3y + z = 2$$

$$4x - 2y + 3z = -4$$

## Cramerovo pravilo

$$D =$$

$$2x - y + 2z = 1$$

$$x - 3y + z = 2$$

$$4x - 2y + 3z = -4$$



## Cramerovo pravilo

$$D = \begin{vmatrix} & & \\ & & \\ & & \end{vmatrix}$$

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$

## Cramerovo pravilo

$$D = \begin{vmatrix} 2 & -1 & 2 \\ \end{vmatrix}$$

$$2x - y + 2z = 1$$

$$x - 3y + z = 2$$

$$4x - 2y + 3z = -4$$

## Cramerovo pravilo

$$D = \begin{vmatrix} 2 & -1 & 2 \\ 1 & -3 & 1 \end{vmatrix}$$

$$2x - y + 2z = 1$$

$$x - 3y + z = 2$$

$$4x - 2y + 3z = -4$$

## Cramerovo pravilo

$$D = \begin{vmatrix} 2 & -1 & 2 \\ 1 & -3 & 1 \\ 4 & -2 & 3 \end{vmatrix}$$

$$2x - y + 2z = 1$$

$$x - 3y + z = 2$$

$$4x - 2y + 3z = -4$$

## Cramerovo pravilo

$$D = \begin{vmatrix} 2 & -1 & 2 \\ 1 & -3 & 1 \\ 4 & -2 & 3 \end{vmatrix} = 5$$

$$2x - y + 2z = 1$$

$$x - 3y + z = 2$$

$$4x - 2y + 3z = -4$$

## Cramerovo pravilo

$$D = \begin{vmatrix} 2 & -1 & 2 \\ 1 & -3 & 1 \\ 4 & -2 & 3 \end{vmatrix} = 5$$

$$D_1 =$$

$$2x - y + 2z = 1$$

$$x - 3y + z = 2$$

$$4x - 2y + 3z = -4$$

## Cramerovo pravilo

$$D = \begin{vmatrix} 2 & -1 & 2 \\ 1 & -3 & 1 \\ 4 & -2 & 3 \end{vmatrix} = 5$$

$$D_1 = \begin{vmatrix} & & \\ & & \\ & & \end{vmatrix}$$

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$

## Cramerovo pravilo

$$D = \begin{vmatrix} 2 & -1 & 2 \\ 1 & -3 & 1 \\ 4 & -2 & 3 \end{vmatrix} = 5$$

$$D_1 = \begin{vmatrix} 1 & & \\ 2 & & \\ -4 & & \end{vmatrix}$$

$$2x - y + 2z = 1$$

$$x - 3y + z = 2$$

$$4x - 2y + 3z = -4$$



## Cramerovo pravilo

$$D = \begin{vmatrix} 2 & -1 & 2 \\ 1 & -3 & 1 \\ 4 & -2 & 3 \end{vmatrix} = 5$$

$$D_1 = \begin{vmatrix} 1 & -1 \\ 2 & -3 \\ -4 & -2 \end{vmatrix}$$

$$2x - y + 2z = 1$$

$$x - 3y + z = 2$$

$$4x - 2y + 3z = -4$$

## Cramerovo pravilo

$$D = \begin{vmatrix} 2 & -1 & 2 \\ 1 & -3 & 1 \\ 4 & -2 & 3 \end{vmatrix} = 5$$

$$D_1 = \begin{vmatrix} 1 & -1 & 2 \\ 2 & -3 & 1 \\ -4 & -2 & 3 \end{vmatrix}$$

$$2x - y + 2z = 1$$

$$x - 3y + z = 2$$

$$4x - 2y + 3z = -4$$

## Cramerovo pravilo

$$D = \begin{vmatrix} 2 & -1 & 2 \\ 1 & -3 & 1 \\ 4 & -2 & 3 \end{vmatrix} = 5$$

$$D_1 = \begin{vmatrix} 1 & -1 & 2 \\ 2 & -3 & 1 \\ -4 & -2 & 3 \end{vmatrix} = -29$$

$$2x - y + 2z = 1$$

$$x - 3y + z = 2$$

$$4x - 2y + 3z = -4$$

## Cramerovo pravilo

$$D = \begin{vmatrix} 2 & -1 & 2 \\ 1 & -3 & 1 \\ 4 & -2 & 3 \end{vmatrix} = 5$$

$$D_1 = \begin{vmatrix} 1 & -1 & 2 \\ 2 & -3 & 1 \\ -4 & -2 & 3 \end{vmatrix} = -29$$

$$D_2 =$$

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$

## Cramerovo pravilo

$$D = \begin{vmatrix} 2 & -1 & 2 \\ 1 & -3 & 1 \\ 4 & -2 & 3 \end{vmatrix} = 5$$

$$D_1 = \begin{vmatrix} 1 & -1 & 2 \\ 2 & -3 & 1 \\ -4 & -2 & 3 \end{vmatrix} = -29$$

$$D_2 = \begin{vmatrix} \phantom{0} & \phantom{0} & \phantom{0} \\ \phantom{0} & \phantom{0} & \phantom{0} \\ \phantom{0} & \phantom{0} & \phantom{0} \end{vmatrix}$$

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$

## Cramerovo pravilo

$$D = \begin{vmatrix} 2 & -1 & 2 \\ 1 & -3 & 1 \\ 4 & -2 & 3 \end{vmatrix} = 5$$

$$D_1 = \begin{vmatrix} 1 & -1 & 2 \\ 2 & -3 & 1 \\ -4 & -2 & 3 \end{vmatrix} = -29$$

$$D_2 = \begin{vmatrix} 1 \\ 2 \\ -4 \end{vmatrix}$$

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$

## Cramerovo pravilo

$$D = \begin{vmatrix} 2 & -1 & 2 \\ 1 & -3 & 1 \\ 4 & -2 & 3 \end{vmatrix} = 5$$

$$D_1 = \begin{vmatrix} 1 & -1 & 2 \\ 2 & -3 & 1 \\ -4 & -2 & 3 \end{vmatrix} = -29$$

$$D_2 = \begin{vmatrix} 2 & 1 \\ 1 & 2 \\ 4 & -4 \end{vmatrix}$$

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$

## Cramerovo pravilo

$$D = \begin{vmatrix} 2 & -1 & 2 \\ 1 & -3 & 1 \\ 4 & -2 & 3 \end{vmatrix} = 5$$

$$D_1 = \begin{vmatrix} 1 & -1 & 2 \\ 2 & -3 & 1 \\ -4 & -2 & 3 \end{vmatrix} = -29$$

$$D_2 = \begin{vmatrix} 2 & 1 & 2 \\ 1 & 2 & 1 \\ 4 & -4 & 3 \end{vmatrix}$$

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$



## Cramerovo pravilo

$$D = \begin{vmatrix} 2 & -1 & 2 \\ 1 & -3 & 1 \\ 4 & -2 & 3 \end{vmatrix} = 5$$

$$D_1 = \begin{vmatrix} 1 & -1 & 2 \\ 2 & -3 & 1 \\ -4 & -2 & 3 \end{vmatrix} = -29$$

$$D_2 = \begin{vmatrix} 2 & 1 & 2 \\ 1 & 2 & 1 \\ 4 & -4 & 3 \end{vmatrix} = -3$$

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$

## Cramerovo pravilo

$$D = \begin{vmatrix} 2 & -1 & 2 \\ 1 & -3 & 1 \\ 4 & -2 & 3 \end{vmatrix} = 5$$

$$D_1 = \begin{vmatrix} 1 & -1 & 2 \\ 2 & -3 & 1 \\ -4 & -2 & 3 \end{vmatrix} = -29$$

$$D_2 = \begin{vmatrix} 2 & 1 & 2 \\ 1 & 2 & 1 \\ 4 & -4 & 3 \end{vmatrix} = -3$$

$$D_3 =$$

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$

## Cramerovo pravilo

$$D = \begin{vmatrix} 2 & -1 & 2 \\ 1 & -3 & 1 \\ 4 & -2 & 3 \end{vmatrix} = 5$$

$$D_1 = \begin{vmatrix} 1 & -1 & 2 \\ 2 & -3 & 1 \\ -4 & -2 & 3 \end{vmatrix} = -29$$

$$D_2 = \begin{vmatrix} 2 & 1 & 2 \\ 1 & 2 & 1 \\ 4 & -4 & 3 \end{vmatrix} = -3$$

$$D_3 = \begin{vmatrix} & & \\ & & \\ & & \end{vmatrix}$$

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$

## Cramerovo pravilo

$$D = \begin{vmatrix} 2 & -1 & 2 \\ 1 & -3 & 1 \\ 4 & -2 & 3 \end{vmatrix} = 5$$

$$D_1 = \begin{vmatrix} 1 & -1 & 2 \\ 2 & -3 & 1 \\ -4 & -2 & 3 \end{vmatrix} = -29$$

$$D_2 = \begin{vmatrix} 2 & 1 & 2 \\ 1 & 2 & 1 \\ 4 & -4 & 3 \end{vmatrix} = -3$$

$$D_3 = \begin{vmatrix} & & 1 \\ & & 2 \\ & & -4 \end{vmatrix}$$

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$

## Cramerovo pravilo

$$D = \begin{vmatrix} 2 & -1 & 2 \\ 1 & -3 & 1 \\ 4 & -2 & 3 \end{vmatrix} = 5$$

$$D_1 = \begin{vmatrix} 1 & -1 & 2 \\ 2 & -3 & 1 \\ -4 & -2 & 3 \end{vmatrix} = -29$$

$$D_2 = \begin{vmatrix} 2 & 1 & 2 \\ 1 & 2 & 1 \\ 4 & -4 & 3 \end{vmatrix} = -3$$

$$D_3 = \begin{vmatrix} 2 & 1 \\ 1 & 2 \\ 4 & -4 \end{vmatrix}$$

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$

## Cramerovo pravilo

$$D = \begin{vmatrix} 2 & -1 & 2 \\ 1 & -3 & 1 \\ 4 & -2 & 3 \end{vmatrix} = 5$$

$$D_1 = \begin{vmatrix} 1 & -1 & 2 \\ 2 & -3 & 1 \\ -4 & -2 & 3 \end{vmatrix} = -29$$

$$D_2 = \begin{vmatrix} 2 & 1 & 2 \\ 1 & 2 & 1 \\ 4 & -4 & 3 \end{vmatrix} = -3$$

$$D_3 = \begin{vmatrix} 2 & -1 & 1 \\ 1 & -3 & 2 \\ 4 & -2 & -4 \end{vmatrix}$$

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$

## Cramerovo pravilo

$$D = \begin{vmatrix} 2 & -1 & 2 \\ 1 & -3 & 1 \\ 4 & -2 & 3 \end{vmatrix} = 5$$

$$D_1 = \begin{vmatrix} 1 & -1 & 2 \\ 2 & -3 & 1 \\ -4 & -2 & 3 \end{vmatrix} = -29$$

$$D_2 = \begin{vmatrix} 2 & 1 & 2 \\ 1 & 2 & 1 \\ 4 & -4 & 3 \end{vmatrix} = -3$$

$$D_3 = \begin{vmatrix} 2 & -1 & 1 \\ 1 & -3 & 2 \\ 4 & -2 & -4 \end{vmatrix} = 30$$

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$

## Cramerovo pravilo

$$D = \begin{vmatrix} 2 & -1 & 2 \\ 1 & -3 & 1 \\ 4 & -2 & 3 \end{vmatrix} = 5$$

$$D_1 = \begin{vmatrix} 1 & -1 & 2 \\ 2 & -3 & 1 \\ -4 & -2 & 3 \end{vmatrix} = -29$$

$$D_2 = \begin{vmatrix} 2 & 1 & 2 \\ 1 & 2 & 1 \\ 4 & -4 & 3 \end{vmatrix} = -3$$

$$D_3 = \begin{vmatrix} 2 & -1 & 1 \\ 1 & -3 & 2 \\ 4 & -2 & -4 \end{vmatrix} = 30$$

$$x = \frac{D_1}{D}$$

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$



## Cramerovo pravilo

$$D = \begin{vmatrix} 2 & -1 & 2 \\ 1 & -3 & 1 \\ 4 & -2 & 3 \end{vmatrix} = 5$$

$$D_1 = \begin{vmatrix} 1 & -1 & 2 \\ 2 & -3 & 1 \\ -4 & -2 & 3 \end{vmatrix} = -29$$

$$D_2 = \begin{vmatrix} 2 & 1 & 2 \\ 1 & 2 & 1 \\ 4 & -4 & 3 \end{vmatrix} = -3$$

$$D_3 = \begin{vmatrix} 2 & -1 & 1 \\ 1 & -3 & 2 \\ 4 & -2 & -4 \end{vmatrix} = 30$$

$$x = \frac{D_1}{D} = \frac{-29}{5}$$

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$

## Cramerovo pravilo

$$D = \begin{vmatrix} 2 & -1 & 2 \\ 1 & -3 & 1 \\ 4 & -2 & 3 \end{vmatrix} = 5$$

$$D_1 = \begin{vmatrix} 1 & -1 & 2 \\ 2 & -3 & 1 \\ -4 & -2 & 3 \end{vmatrix} = -29$$

$$D_2 = \begin{vmatrix} 2 & 1 & 2 \\ 1 & 2 & 1 \\ 4 & -4 & 3 \end{vmatrix} = -3$$

$$D_3 = \begin{vmatrix} 2 & -1 & 1 \\ 1 & -3 & 2 \\ 4 & -2 & -4 \end{vmatrix} = 30$$

$$x = \frac{D_1}{D} = \frac{-29}{5} \quad y = \frac{D_2}{D}$$

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$

## Cramerovo pravilo

$$D = \begin{vmatrix} 2 & -1 & 2 \\ 1 & -3 & 1 \\ 4 & -2 & 3 \end{vmatrix} = 5$$

$$D_1 = \begin{vmatrix} 1 & -1 & 2 \\ 2 & -3 & 1 \\ -4 & -2 & 3 \end{vmatrix} = -29$$

$$D_2 = \begin{vmatrix} 2 & 1 & 2 \\ 1 & 2 & 1 \\ 4 & -4 & 3 \end{vmatrix} = -3$$

$$D_3 = \begin{vmatrix} 2 & -1 & 1 \\ 1 & -3 & 2 \\ 4 & -2 & -4 \end{vmatrix} = 30$$

$$x = \frac{D_1}{D} = \frac{-29}{5} \quad y = \frac{D_2}{D} = \frac{-3}{5}$$

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$

## Cramerovo pravilo

$$D = \begin{vmatrix} 2 & -1 & 2 \\ 1 & -3 & 1 \\ 4 & -2 & 3 \end{vmatrix} = 5$$

$$D_1 = \begin{vmatrix} 1 & -1 & 2 \\ 2 & -3 & 1 \\ -4 & -2 & 3 \end{vmatrix} = -29$$

$$D_2 = \begin{vmatrix} 2 & 1 & 2 \\ 1 & 2 & 1 \\ 4 & -4 & 3 \end{vmatrix} = -3$$

$$D_3 = \begin{vmatrix} 2 & -1 & 1 \\ 1 & -3 & 2 \\ 4 & -2 & -4 \end{vmatrix} = 30$$

$$x = \frac{D_1}{D} = \frac{-29}{5} \quad y = \frac{D_2}{D} = \frac{-3}{5}$$

$$z = \frac{D_3}{D}$$

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$

## Cramerovo pravilo

$$D = \begin{vmatrix} 2 & -1 & 2 \\ 1 & -3 & 1 \\ 4 & -2 & 3 \end{vmatrix} = 5$$

$$D_1 = \begin{vmatrix} 1 & -1 & 2 \\ 2 & -3 & 1 \\ -4 & -2 & 3 \end{vmatrix} = -29$$

$$D_2 = \begin{vmatrix} 2 & 1 & 2 \\ 1 & 2 & 1 \\ 4 & -4 & 3 \end{vmatrix} = -3$$

$$D_3 = \begin{vmatrix} 2 & -1 & 1 \\ 1 & -3 & 2 \\ 4 & -2 & -4 \end{vmatrix} = 30$$

$$x = \frac{D_1}{D} = \frac{-29}{5} \quad y = \frac{D_2}{D} = \frac{-3}{5}$$

$$z = \frac{D_3}{D} = \frac{30}{5}$$

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$

## Cramerovo pravilo

$$D = \begin{vmatrix} 2 & -1 & 2 \\ 1 & -3 & 1 \\ 4 & -2 & 3 \end{vmatrix} = 5$$

$$D_1 = \begin{vmatrix} 1 & -1 & 2 \\ 2 & -3 & 1 \\ -4 & -2 & 3 \end{vmatrix} = -29$$

$$D_2 = \begin{vmatrix} 2 & 1 & 2 \\ 1 & 2 & 1 \\ 4 & -4 & 3 \end{vmatrix} = -3$$

$$D_3 = \begin{vmatrix} 2 & -1 & 1 \\ 1 & -3 & 2 \\ 4 & -2 & -4 \end{vmatrix} = 30$$

$$x = \frac{D_1}{D} = \frac{-29}{5} \quad y = \frac{D_2}{D} = \frac{-3}{5}$$

$$z = \frac{D_3}{D} = \frac{30}{5} = 6$$

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$

## Gaussov postupak

$$2x - y + 2z = 1$$

$$x - 3y + z = 2$$

$$4x - 2y + 3z = -4$$

$x$	$y$	$z$
-----	-----	-----

## Gaussov postupak

$$2x - y + 2z = 1$$

$$x - 3y + z = 2$$

$$4x - 2y + 3z = -4$$



$x$	$y$	$z$
2	-1	2

## Gaussov postupak

$$2x - y + 2z = 1$$

$$x - 3y + z = 2$$

$$4x - 2y + 3z = -4$$

$x$	$y$	$z$	
2	-1	2	1

## Gaussov postupak

$$2x - y + 2z = 1$$

$$x - 3y + z = 2$$

$$4x - 2y + 3z = -4$$

$x$	$y$	$z$	
2	-1	2	1
1	-3	1	

## Gaussov postupak

$$2x - y + 2z = 1$$

$$x - 3y + z = 2$$

$$4x - 2y + 3z = -4$$

$x$	$y$	$z$	
2	-1	2	1
1	-3	1	2

## Gaussov postupak

$$2x - y + 2z = 1$$

$$x - 3y + z = 2$$

$$4x - 2y + 3z = -4$$

$x$	$y$	$z$	
2	-1	2	1
1	-3	1	2
4	-2	3	

## Gaussov postupak

$$2x - y + 2z = 1$$

$$x - 3y + z = 2$$

$$4x - 2y + 3z = -4$$

$x$	$y$	$z$	
2	-1	2	1
1	-3	1	2
4	-2	3	-4

## Gaussov postupak

$$2x - y + 2z = 1$$

$$x - 3y + z = 2$$

$$4x - 2y + 3z = -4$$

## Gaussov postupak

$x$	$y$	$z$	
2	-1	2	1
1	-3	1	2
4	-2	3	-4

$$2x - y + 2z = 1$$

$$x - 3y + z = 2$$

$$4x - 2y + 3z = -4$$

## Gaussov postupak

$x$	$y$	$z$	
2	-1	2	1
①	-3	1	2
4	-2	3	-4

$$2x - y + 2z = 1$$

$$x - 3y + z = 2$$

$$4x - 2y + 3z = -4$$



## Gaussov postupak

$x$	$y$	$z$	
2	-1	2	1
①	-3	1	2 $/ \cdot (-2)$
4	-2	3	-4

$$2x - y + 2z = 1$$

$$x - 3y + z = 2$$

$$4x - 2y + 3z = -4$$

## Gaussov postupak

$x$	$y$	$z$	
2	-1	2	1
① -3	-3	1	2 $\swarrow \cdot (-2)$
4	-2	3	-4

$$2x - y + 2z = 1$$

$$x - 3y + z = 2$$

$$4x - 2y + 3z = -4$$

## Gaussov postupak

$x$	$y$	$z$	
2	-1	2	1
① -3	1	2	$\swarrow \cdot (-2) \swarrow \cdot (-4)$
4	-2	3	-4

$$2x - y + 2z = 1$$

$$x - 3y + z = 2$$

$$4x - 2y + 3z = -4$$

# Gaussov postupak

$x$	$y$	$z$	
2	-1	2	1
① -3	-3	1	2
4	-2	3	-4

$\swarrow +$   
 $\nearrow +$   
 $\swarrow +$

$\nearrow +$   
 $\swarrow +$

$\swarrow +$   
 $\nearrow +$

①

$\nearrow +$   
 $\swarrow +$   
 $\swarrow +$

$$2x - y + 2z = 1$$

$$x - 3y + z = 2$$

$$4x - 2y + 3z = -4$$

# Gaussov postupak

x	y	z	
2	-1	2	1
① -3	-3	1	2
4	-2	3	-4
1	-3	1	2

$/ \cdot (-2) / \cdot (-4)$

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$

# Gaussov postupak

x	y	z	
2	-1	2	1
① -3	1	2	$\swarrow \cdot (-2) \searrow \cdot (-4)$
4	-2	3	-4
0			
1	-3	1	2

$$2x - y + 2z = 1$$

$$x - 3y + z = 2$$

$$4x - 2y + 3z = -4$$

# Gaussov postupak

x	y	z	
2	-1	2	1
① -3	1	2	$\div \cdot (-2) \div \cdot (-4)$
4	-2	3	-4
0	5		
1	-3	1	2

$$2x - y + 2z = 1$$

$$x - 3y + z = 2$$

$$4x - 2y + 3z = -4$$

# Gaussov postupak

x	y	z	
2	-1	2	1
① -3	-3	1	2
4	-2	3	-4
0	5	0	
1	-3	1	2

+

$/ \cdot (-2) / \cdot (-4)$

+

$$2x - y + 2z = 1$$

$$x - 3y + z = 2$$

$$4x - 2y + 3z = -4$$



# Gaussov postupak

x	y	z	
2	-1	2	1
① -3	-3	1	2
4	-2	3	-4
0	5	0	-3
1	-3	1	2

+

$/ \cdot (-2) / \cdot (-4)$

+

$$2x - y + 2z = 1$$

$$x - 3y + z = 2$$

$$4x - 2y + 3z = -4$$

# Gaussov postupak

x	y	z	
2	-1	2	1
①	-3	1	2
4	-2	3	-4
0	5	0	-3
1	-3	1	2
0			

+

$/ \cdot (-2) / \cdot (-4)$

+

$$2x - y + 2z = 1$$

$$x - 3y + z = 2$$

$$4x - 2y + 3z = -4$$

# Gaussov postupak

x	y	z	
2	-1	2	1
① -3	1	2	$\swarrow \cdot (-2) \searrow \cdot (-4)$
4	-2	3	-4
0	5	0	-3
1	-3	1	2
0	10		

$$2x - y + 2z = 1$$

$$x - 3y + z = 2$$

$$4x - 2y + 3z = -4$$

# Gaussov postupak

x	y	z	
2	-1	2	1
① -3	1	2	$\swarrow \cdot (-2) \searrow \cdot (-4)$
4	-2	3	-4
0	5	0	-3
1	-3	1	2
0	10	-1	

$$2x - y + 2z = 1$$

$$x - 3y + z = 2$$

$$4x - 2y + 3z = -4$$

# Gaussov postupak

x	y	z	
2	-1	2	1
① -3	1	2	$\swarrow \cdot (-2) \searrow \cdot (-4)$
4	-2	3	-4
0	5	0	-3
1	-3	1	2
0	10	-1	-12

$$2x - y + 2z = 1$$

$$x - 3y + z = 2$$

$$4x - 2y + 3z = -4$$

# Gaussov postupak

x	y	z	
2	-1	2	1
①	-3	1	2
4	-2	3	-4
0	5	0	-3
1	-3	1	2
0	10	-1	-12

+

$/ \cdot (-2) / \cdot (-4)$

+

$$2x - y + 2z = 1$$

$$x - 3y + z = 2$$

$$4x - 2y + 3z = -4$$

# Gaussov postupak

x	y	z	
2	-1	2	1
①	-3	1	2
4	-2	3	-4
0	5	0	-3
1	-3	1	2
0	10	-1	-12

$\swarrow +$   
 $\nearrow +$   
 $\swarrow +$   
 $\nearrow +$

$$2x - y + 2z = 1$$

$$x - 3y + z = 2$$

$$4x - 2y + 3z = -4$$

# Gaussov postupak

x	y	z	
2	-1	2	1
①	-3	1	2
4	-2	3	-4
0	5	0	-3
1	-3	1	2
0	10	-1	-12

$\swarrow +$   
 $\swarrow \cdot (-2) \swarrow \cdot (-4)$

$\swarrow +$

$\swarrow \cdot 1$

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$



# Gaussov postupak

x	y	z	
2	-1	2	1
①	-3	1	2
4	-2	3	-4
0	5	0	-3
1	-3	1	2
0	10	-1	-12

+

$/ \cdot (-2) / \cdot (-4)$

+

+

$/ \cdot 1$

$$2x - y + 2z = 1$$

$$x - 3y + z = 2$$

$$4x - 2y + 3z = -4$$

# Gaussov postupak

x	y	z	
2	-1	2	1
①	-3	1	2
4	-2	3	-4
0	5	0	-3
1	-3	1	2
0	10	-1	-12
0	10	-1	-12

$+ \rightarrow$   
 $/ \cdot (-2) / \cdot (-4)$

$+ \rightarrow$

$+ \rightarrow$   
 $/ \cdot 1$

$$2x - y + 2z = 1$$

$$x - 3y + z = 2$$

$$4x - 2y + 3z = -4$$

# Gaussov postupak

x	y	z	
2	-1	2	1
①	-3	1	2
4	-2	3	-4
0	5	0	-3
1	-3	1	2
0	10	-1	-12

$\swarrow +$   
 $\swarrow \cdot (-2) \cdot (-4)$   
 $\swarrow +$   
 $\swarrow +$   
 $\swarrow \cdot 1$

$$2x - y + 2z = 1$$

$$x - 3y + z = 2$$

$$4x - 2y + 3z = -4$$

# Gaussov postupak

x	y	z	
2	-1	2	1
①	-3	1	2
4	-2	3	-4
0	5	0	-3
1	-3	1	2
0	10	-1	-12

1	7		
0	10	-1	-12

$/ \cdot (-2) / \cdot (-4)$

$/ \cdot 1$

$$2x - y + 2z = 1$$

$$x - 3y + z = 2$$

$$4x - 2y + 3z = -4$$

# Gaussov postupak

x	y	z	
2	-1	2	1
①	-3	1	2
4	-2	3	-4
0	5	0	-3
1	-3	1	2
0	10	① -1	-12
1	7	0	
0	10	-1	-12

$\swarrow +$   
 $\swarrow \cdot (-2) \cdot (-4)$

$\swarrow +$

$\swarrow +$

$\swarrow \cdot 1$

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$

# Gaussov postupak

x	y	z	
2	-1	2	1
①	-3	1	2
4	-2	3	-4
0	5	0	-3
1	-3	1	2
0	10	-1	-12
1	7	0	-10
0	10	-1	-12

$/ \cdot (-2) / \cdot (-4)$

$/ \cdot 1$

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$

# Gaussov postupak

x	y	z	
2	-1	2	1
①	-3	1	2
4	-2	3	-4
0	5	0	-3
1	-3	1	2
0	10	-1	-12
0	5	0	-3
1	7	0	-10
0	10	-1	-12

+

$/ \cdot (-2) / \cdot (-4)$

+

+

$/ \cdot 1$

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$

# Gaussov postupak

x	y	z	
2	-1	2	1
①	-3	1	2
4	-2	3	-4
0	5	0	-3
1	-3	1	2
0	10	① -1	-12
0	5	0	-3
1	7	0	-10
0	10	-1	-12

$+ \quad / \cdot (-2) / \cdot (-4)$

$+ \quad +$

$+ \quad / \cdot 1$

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$



# Gaussov postupak

x	y	z	
2	-1	2	1
①	-3	1	2
4	-2	3	-4
0	5	0	-3
1	-3	1	2
0	10	-1	-12
0	5	0	-3
1	7	0	-10
0	10	-1	-12

$+ \quad / \cdot (-2) / \cdot (-4)$

$+ \quad / \cdot 1$

$+ \quad / \cdot \frac{1}{5}$

$$2x - y + 2z = 1$$

$$x - 3y + z = 2$$

$$4x - 2y + 3z = -4$$

# Gaussov postupak

x	y	z	
2	-1	2	1
①	-3	1	2
4	-2	3	-4
0	5	0	-3
1	-3	1	2
0	10	① -1	-12
0	5	0	-3
1	7	0	-10
0	10	-1	-12

$/ \cdot (-2) / \cdot (-4)$

$/ \cdot 1$   
 $/ \cdot \frac{1}{5}$

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$

x	y	z

# Gaussov postupak

x	y	z	
2	-1	2	1
①	-3	1	2
4	-2	3	-4
0	5	0	-3
1	-3	1	2
0	10	-1	-12
0	5	0	-3
1	7	0	-10
0	10	-1	-12

$\swarrow +$   
 $\swarrow \cdot (-2) \swarrow \cdot (-4)$

$\swarrow +$

$\swarrow +$

$\swarrow \cdot 1$   
 $\swarrow \cdot \frac{1}{5}$

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$

x	y	z
0		

# Gaussov postupak

x	y	z	
2	-1	2	1
①	-3	1	2
4	-2	3	-4
0	5	0	-3
1	-3	1	2
0	10	-1	-12
0	5	0	-3
1	7	0	-10
0	10	-1	-12

$/ \cdot (-2) / \cdot (-4)$

$/ \cdot 1$   
 $/ \cdot \frac{1}{5}$

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$

x	y	z
0	1	

# Gaussov postupak

x	y	z	
2	-1	2	1
①	-3	1	2
4	-2	3	-4
0	5	0	-3
1	-3	1	2
0	10	-1	-12
0	5	0	-3
1	7	0	-10
0	10	-1	-12

$\swarrow +$   
 $\swarrow \cdot (-2) \swarrow \cdot (-4)$

$\swarrow +$

$\swarrow +$

$\swarrow \cdot 1$

$\swarrow \cdot \frac{1}{5}$

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$

x	y	z
0	1	0

# Gaussov postupak

x	y	z	
2	-1	2	1
①	-3	1	2
4	-2	3	-4
0	5	0	-3
1	-3	1	2
0	10	-1	-12
0	5	0	-3
1	7	0	-10
0	10	-1	-12

$/ \cdot (-2) / \cdot (-4)$

$/ \cdot 1$   
 $/ \cdot \frac{1}{5}$

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$

x	y	z	
0	1	0	$-\frac{3}{5}$

# Gaussov postupak

x	y	z	
2	-1	2	1
①	-3	1	2
4	-2	3	-4
0	5	0	-3
1	-3	1	2
0	10	-1	-12
0	5	0	-3
1	7	0	-10
0	10	-1	-12

$/ \cdot (-2) / \cdot (-4)$

$/ \cdot 1$   
 $/ \cdot \frac{1}{5}$

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$

x	y	z	
0	1	0	$-\frac{3}{5}$
1	7	0	-10

# Gaussov postupak

x	y	z	
2	-1	2	1
① -3	1	2	$\div \cdot (-2) \div \cdot (-4)$
4	-2	3	-4
0	5	0	-3
1	-3	1	2
0	10	① -1	-12 $\div \cdot 1$
0	5	0	-3 $\div \cdot \frac{1}{5}$
1	7	0	-10
0	10	-1	-12

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$

x	y	z	
0	1	0	$-\frac{3}{5}$
1	7	0	-10
0	10	-1	-12



# Gaussov postupak

x	y	z	
2	-1	2	1
① -3	1	2	$\swarrow \cdot (-2) \searrow \cdot (-4)$
4	-2	3	-4
<hr/>			
0	5	0	-3
1	-3	1	2
0	10	① -1	-12
<hr/>			
0	5	0	-3
1	7	0	-10
0	10	-1	-12

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$

x	y	z	
0	1	0	$-\frac{3}{5}$
1	7	0	-10
0	10	-1	-12

# Gaussov postupak

x	y	z	
2	-1	2	1
①	-3	1	2
4	-2	3	-4
0	5	0	-3
1	-3	1	2
0	10	① -1	-12
0	5	0	-3
1	7	0	-10
0	10	-1	-12

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$

x	y	z	
0	①	0	$-\frac{3}{5}$
1	7	0	-10
0	10	-1	-12

# Gaussov postupak

x	y	z	
2	-1	2	1
①	-3	1	2
4	-2	3	-4
0	5	0	-3
1	-3	1	2
0	10	-1	-12
0	5	0	-3
1	7	0	-10
0	10	-1	-12

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$

x	y	z	
0	①	0	$-\frac{3}{5}$
1	7	0	-10
0	10	-1	-12

# Gaussov postupak

x	y	z	
2	-1	2	1
①	-3	1	2
4	-2	3	-4
0	5	0	-3
1	-3	1	2
0	10	① -1	-12
0	5	0	-3
1	7	0	-10
0	10	-1	-12

$\swarrow +$   
 $\swarrow \cdot (-2) \swarrow \cdot (-4)$

$\swarrow +$

$\swarrow +$

$\swarrow \cdot 1$

$\swarrow \cdot \frac{1}{5}$

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$

x	y	z	
0	①	0	$-\frac{3}{5} \swarrow \cdot (-7)$
1	7	0	-10
0	10	-1	-12

$\swarrow +$

# Gaussov postupak

x	y	z	
2	-1	2	1
①	-3	1	2
4	-2	3	-4
0	5	0	-3
1	-3	1	2
0	10	-1	-12
0	5	0	-3
1	7	0	-10
0	10	-1	-12

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$

x	y	z	
0	①	0	$-\frac{3}{5}$
1	7	0	-10
0	10	-1	-12

# Gaussov postupak

x	y	z	
2	-1	2	1
①	-3	1	2
4	-2	3	-4
0	5	0	-3
1	-3	1	2
0	10	① -1	-12
0	5	0	-3
1	7	0	-10
0	10	-1	-12

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$

x	y	z	
0	①	0	$-\frac{3}{5}$
1	7	0	-10
0	10	-1	-12

# Gaussov postupak

x	y	z	
2	-1	2	1
①	-3	1	2
4	-2	3	-4
0	5	0	-3
1	-3	1	2
0	10	① -1	-12
0	5	0	-3
1	7	0	-10
0	10	-1	-12

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$

x	y	z	
0	①	0	$-\frac{3}{5}$
1	7	0	-10
0	10	-1	-12
0	1	0	$-\frac{3}{5}$

# Gaussov postupak

x	y	z	
2	-1	2	1
①	-3	1	2
4	-2	3	-4
0	5	0	-3
1	-3	1	2
0	10	① -1	-12
0	5	0	-3
1	7	0	-10
0	10	-1	-12

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$

x	y	z	
0	①	0	$-\frac{3}{5}$
1	7	0	-10
0	10	-1	-12
0	1	0	$-\frac{3}{5}$
1			



# Gaussov postupak

x	y	z	
2	-1	2	1
①	-3	1	2
4	-2	3	-4
0	5	0	-3
1	-3	1	2
0	10	① -1	-12
0	5	0	-3
1	7	0	-10
0	10	-1	-12

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$

x	y	z	
0	①	0	$-\frac{3}{5}$
1	7	0	-10
0	10	-1	-12
0	1	0	$-\frac{3}{5}$
1	0		

# Gaussov postupak

x	y	z	
2	-1	2	1
①	-3	1	2
4	-2	3	-4
0	5	0	-3
1	-3	1	2
0	10	-1	-12
0	5	0	-3
1	7	0	-10
0	10	-1	-12

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$

x	y	z	
0	①	0	$-\frac{3}{5}$
1	7	0	-10
0	10	-1	-12
0	1	0	$-\frac{3}{5}$
1	0	0	

# Gaussov postupak

x	y	z	
2	-1	2	1
①	-3	1	2
4	-2	3	-4
0	5	0	-3
1	-3	1	2
0	10	① -1	-12
0	5	0	-3
1	7	0	-10
0	10	-1	-12

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$

x	y	z	
0	①	0	$-\frac{3}{5}$
1	7	0	-10
0	10	-1	-12
0	1	0	$-\frac{3}{5}$
1	0	0	$-\frac{29}{5}$

# Gaussov postupak

x	y	z	
2	-1	2	1
①	-3	1	2
4	-2	3	-4
0	5	0	-3
1	-3	1	2
0	10	① -1	-12
0	5	0	-3
1	7	0	-10
0	10	-1	-12

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$

x	y	z	
0	①	0	$-\frac{3}{5}$
1	7	0	-10
0	10	-1	-12
0	1	0	$-\frac{3}{5}$
1	0	0	$-\frac{29}{5}$
0			

# Gaussov postupak

x	y	z	
2	-1	2	1
①	-3	1	2
4	-2	3	-4
0	5	0	-3
1	-3	1	2
0	10	① -1	-12
0	5	0	-3
1	7	0	-10
0	10	-1	-12

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$

x	y	z	
0	①	0	$-\frac{3}{5}$
1	7	0	-10
0	10	-1	-12
0	1	0	$-\frac{3}{5}$
1	0	0	$-\frac{29}{5}$
0	0		

# Gaussov postupak

x	y	z	
2	-1	2	1
①	-3	1	2
4	-2	3	-4
0	5	0	-3
1	-3	1	2
0	10	① -1	-12
0	5	0	-3
1	7	0	-10
0	10	-1	-12

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$

x	y	z	
0	①	0	$-\frac{3}{5}$
1	7	0	-10
0	10	-1	-12
0	1	0	$-\frac{3}{5}$
1	0	0	$-\frac{29}{5}$
0	0	-1	

# Gaussov postupak

x	y	z	
2	-1	2	1
①	-3	1	2
4	-2	3	-4
0	5	0	-3
1	-3	1	2
0	10	① -1	-12
0	5	0	-3
1	7	0	-10
0	10	-1	-12

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$

x	y	z	
0	①	0	$-\frac{3}{5}$
1	7	0	-10
0	10	-1	-12
0	1	0	$-\frac{3}{5}$
1	0	0	$-\frac{29}{5}$
0	0	-1	-6

# Gaussov postupak

x	y	z	
2	-1	2	1
①	-3	1	2
4	-2	3	-4
0	5	0	-3
1	-3	1	2
0	10	① -1	-12
0	5	0	-3
1	7	0	-10
0	10	-1	-12

$$y = -\frac{3}{5}$$

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$

x	y	z	
0	①	0	$-\frac{3}{5}$
1	7	0	-10
0	10	-1	-12
0	1	0	$-\frac{3}{5}$
1	0	0	$-\frac{29}{5}$
0	0	-1	-6



# Gaussov postupak

x	y	z	
2	-1	2	1
①	-3	1	2
4	-2	3	-4
0	5	0	-3
1	-3	1	2
0	10	-1	-12
0	5	0	-3
1	7	0	-10
0	10	-1	-12

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$

x	y	z	
0	①	0	$-\frac{3}{5}$
1	7	0	-10
0	10	-1	-12
0	1	0	$-\frac{3}{5}$
1	0	0	$-\frac{29}{5}$
0	0	-1	-6

$$y = -\frac{3}{5}$$

$$x = -\frac{29}{5}$$

# Gaussov postupak

x	y	z	
2	-1	2	1
①	-3	1	2
4	-2	3	-4
0	5	0	-3
1	-3	1	2
0	10	① -1	-12
0	5	0	-3
1	7	0	-10
0	10	-1	-12

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$

x	y	z	
0	①	0	$-\frac{3}{5}$
1	7	0	-10
0	10	-1	-12
0	1	0	$-\frac{3}{5}$
1	0	0	$-\frac{29}{5}$
0	0	-1	-6

$$\begin{aligned} y &= -\frac{3}{5} \\ x &= -\frac{29}{5} \\ -z &= -6 \end{aligned}$$

# Gaussov postupak

x	y	z	
2	-1	2	1
①	-3	1	2
4	-2	3	-4
0	5	0	-3
1	-3	1	2
0	10	-1	-12
0	5	0	-3
1	7	0	-10
0	10	-1	-12

$$\begin{aligned} 2x - y + 2z &= 1 \\ x - 3y + z &= 2 \\ 4x - 2y + 3z &= -4 \end{aligned}$$

x	y	z	
0	①	0	$-\frac{3}{5}$
1	7	0	-10
0	10	-1	-12
0	1	0	$-\frac{3}{5}$
1	0	0	$-\frac{29}{5}$
0	0	-1	-6

$$\begin{aligned} y &= -\frac{3}{5} \\ x &= -\frac{29}{5} \\ -z &= -6 \end{aligned}$$

$$z = 6$$

## **drugi zadatak**

---

## Zadatak 2

*Zadan je sustav linearnih jednadžbi*

$$x_1 - 3x_2 + 5x_3 = 1$$

$$4x_1 + 28x_2 - 28x_3 = 0.$$

$$4x_1 + 8x_2 - 4x_3 = 2$$

- a) *Gaussovim postupkom riješite zadani sustav tako da varijabla  $x_1$  bude parametar.*
- b) *Pronađite sva bazična rješenja.*
- c) *Odredite ono rješenje sustava čija je suma komponenata jednaka 0.*

## Rješenje

a)

$$\begin{aligned}x_1 - 3x_2 + 5x_3 &= 1 \\4x_1 + 28x_2 - 28x_3 &= 0 \\4x_1 + 8x_2 - 4x_3 &= 2\end{aligned}$$

a)

 $x_3$ 

$$4x_1 + 8x_2 - 4x_3 = 2$$

a)

$x_1$	$x_2$	$x_3$	
1	-3	5	

$$4x_1 + 8x_2 - 4x_3 = 2$$



## Rješenje

a)

$x_1$	$x_2$	$x_3$	
1	-3	5	1

$$\begin{aligned}x_1 - 3x_2 + 5x_3 &= 1 \\4x_1 + 28x_2 - 28x_3 &= 0 \\4x_1 + 8x_2 - 4x_3 &= 2\end{aligned}$$

## Rješenje

a)

$x_1$	$x_2$	$x_3$	
1	-3	5	1
4	28	-28	

$$\begin{aligned}x_1 - 3x_2 + 5x_3 &= 1 \\4x_1 + 28x_2 - 28x_3 &= 0 \\4x_1 + 8x_2 - 4x_3 &= 2\end{aligned}$$

## Rješenje

a)

$x_1$	$x_2$	$x_3$	
1	-3	5	1
4	28	-28	0

$$x_1 - 3x_2 + 5x_3 = 1$$

$$4x_1 + 28x_2 - 28x_3 = 0$$

$$4x_1 + 8x_2 - 4x_3 = 2$$

## Rješenje

a)

$x_1$	$x_2$	$x_3$	
1	-3	5	1
4	28	-28	0
4	8	-4	

$$\begin{aligned}x_1 - 3x_2 + 5x_3 &= 1 \\4x_1 + 28x_2 - 28x_3 &= 0 \\4x_1 + 8x_2 - 4x_3 &= 2\end{aligned}$$

## Rješenje

a)

$x_1$	$x_2$	$x_3$	
1	-3	5	1
4	28	-28	0
4	8	-4	2

$$\begin{aligned}x_1 - 3x_2 + 5x_3 &= 1 \\4x_1 + 28x_2 - 28x_3 &= 0 \\4x_1 + 8x_2 - 4x_3 &= 2\end{aligned}$$

## Rješenje

a)

$x_1$	$x_2$	$x_3$	
1	-3	5	1
4	28	-28	0
4	8	-4	2

$$\begin{aligned}x_1 - 3x_2 + 5x_3 &= 1 \\4x_1 + 28x_2 - 28x_3 &= 0 \\4x_1 + 8x_2 - 4x_3 &= 2\end{aligned}$$

## Rješenje

a)

$x_1$	$x_2$	$x_3$	
1	-3	5	1
4	28	-28	0
4	8	-4	2

$$\begin{aligned}x_1 - 3x_2 + 5x_3 &= 1 \\4x_1 + 28x_2 - 28x_3 &= 0 \\4x_1 + 8x_2 - 4x_3 &= 2\end{aligned}$$

## Rješenje

parametar

a)

$x_1$	$x_2$	$x_3$	
1	-3	5	1
4	28	-28	0
4	8	-4	2

$$\begin{aligned}x_1 - 3x_2 + 5x_3 &= 1 \\4x_1 + 28x_2 - 28x_3 &= 0 \\4x_1 + 8x_2 - 4x_3 &= 2\end{aligned}$$



## Rješenje

parametar

a)

$x_1$	$x_2$	$x_3$	
1	-3	5	1
4	28	-28	0
4	8	-4	2

$/: 4$

$$\begin{aligned}x_1 - 3x_2 + 5x_3 &= 1 \\4x_1 + 28x_2 - 28x_3 &= 0 \\4x_1 + 8x_2 - 4x_3 &= 2\end{aligned}$$

## Rješenje

parametar

a)

$x_1$	$x_2$	$x_3$	
1	-3	5	1
4	28	-28	0 / : 4
4	8	-4	2 / : 4

$$\begin{aligned}x_1 - 3x_2 + 5x_3 &= 1 \\4x_1 + 28x_2 - 28x_3 &= 0 \\4x_1 + 8x_2 - 4x_3 &= 2\end{aligned}$$

## Rješenje

parametar

a)

$x_1$	$x_2$	$x_3$	
1	-3	5	1
4	28	-28	0 / : 4
4	8	-4	2 / : 4
1	-3	5	1

$$\begin{aligned}x_1 - 3x_2 + 5x_3 &= 1 \\4x_1 + 28x_2 - 28x_3 &= 0 \\4x_1 + 8x_2 - 4x_3 &= 2\end{aligned}$$

## Rješenje

parametar

a)

$x_1$	$x_2$	$x_3$	
1	-3	5	1
4	28	-28	0 / : 4
4	8	-4	2 / : 4
1	-3	5	1
1			

$$\begin{aligned}x_1 - 3x_2 + 5x_3 &= 1 \\4x_1 + 28x_2 - 28x_3 &= 0 \\4x_1 + 8x_2 - 4x_3 &= 2\end{aligned}$$

## Rješenje

parametar

a)

$x_1$	$x_2$	$x_3$	
1	-3	5	1
4	28	-28	0 / : 4
4	8	-4	2 / : 4
1	-3	5	1
1	7		

$$\begin{aligned}x_1 - 3x_2 + 5x_3 &= 1 \\4x_1 + 28x_2 - 28x_3 &= 0 \\4x_1 + 8x_2 - 4x_3 &= 2\end{aligned}$$

## Rješenje

parametar

a)

$x_1$	$x_2$	$x_3$	
1	-3	5	1
4	28	-28	0 / : 4
4	8	-4	2 / : 4
1	-3	5	1
1	7	-7	

$$\begin{aligned}x_1 - 3x_2 + 5x_3 &= 1 \\4x_1 + 28x_2 - 28x_3 &= 0 \\4x_1 + 8x_2 - 4x_3 &= 2\end{aligned}$$

## Rješenje

parametar

a)

$x_1$	$x_2$	$x_3$	
1	-3	5	1
4	28	-28	0 / : 4
4	8	-4	2 / : 4
1	-3	5	1
1	7	-7	0

$$\begin{aligned}x_1 - 3x_2 + 5x_3 &= 1 \\4x_1 + 28x_2 - 28x_3 &= 0 \\4x_1 + 8x_2 - 4x_3 &= 2\end{aligned}$$

## Rješenje

parametar

a)

$x_1$	$x_2$	$x_3$	
1	-3	5	1
4	28	-28	0 / : 4
4	8	-4	2 / : 4
1	-3	5	1
1	7	-7	0
1			

$$\begin{aligned}x_1 - 3x_2 + 5x_3 &= 1 \\4x_1 + 28x_2 - 28x_3 &= 0 \\4x_1 + 8x_2 - 4x_3 &= 2\end{aligned}$$



## Rješenje

parametar

a)

$x_1$	$x_2$	$x_3$	
1	-3	5	1
4	28	-28	0 / : 4
4	8	-4	2 / : 4
1	-3	5	1
1	7	-7	0
1	2		

$$\begin{aligned}x_1 - 3x_2 + 5x_3 &= 1 \\4x_1 + 28x_2 - 28x_3 &= 0 \\4x_1 + 8x_2 - 4x_3 &= 2\end{aligned}$$

## Rješenje

parametar

a)

$x_1$	$x_2$	$x_3$	
1	-3	5	1
4	28	-28	0 / : 4
4	8	-4	2 / : 4
1	-3	5	1
1	7	-7	0
1	2	-1	

$$\begin{aligned}x_1 - 3x_2 + 5x_3 &= 1 \\4x_1 + 28x_2 - 28x_3 &= 0 \\4x_1 + 8x_2 - 4x_3 &= 2\end{aligned}$$

## Rješenje

parametar

a)

$x_1$	$x_2$	$x_3$	
1	-3	5	1
4	28	-28	0 / : 4
4	8	-4	2 / : 4
1	-3	5	1
1	7	-7	0
1	2	-1	$\frac{1}{2}$

$$\begin{aligned}x_1 - 3x_2 + 5x_3 &= 1 \\4x_1 + 28x_2 - 28x_3 &= 0 \\4x_1 + 8x_2 - 4x_3 &= 2\end{aligned}$$

## Rješenje

parametar

a)

$x_1$	$x_2$	$x_3$	
1	-3	5	1
4	28	-28	0 / : 4
4	8	-4	2 / : 4
1	-3	5	1
1	7	-7	0
1	2	-1	$\frac{1}{2}$

$$\begin{aligned}x_1 - 3x_2 + 5x_3 &= 1 \\4x_1 + 28x_2 - 28x_3 &= 0 \\4x_1 + 8x_2 - 4x_3 &= 2\end{aligned}$$

## Rješenje

parametar

a)

$x_1$	$x_2$	$x_3$	
1	-3	5	1
4	28	-28	0 / : 4
4	8	-4	2 / : 4
1	-3	5	1
1	7	-7	0
1	2	-1	$\frac{1}{2}$

$$\begin{aligned}x_1 - 3x_2 + 5x_3 &= 1 \\4x_1 + 28x_2 - 28x_3 &= 0 \\4x_1 + 8x_2 - 4x_3 &= 2\end{aligned}$$

## Rješenje

parametar

a)

$x_1$	$x_2$	$x_3$	
1	-3	5	1
4	28	-28	0 $/: 4$
4	8	-4	2 $/: 4$
1	-3	5	1
1	7	-7	0
1	2	-1	$\frac{1}{2} \quad / \cdot (-7)$

$$\begin{aligned}x_1 - 3x_2 + 5x_3 &= 1 \\4x_1 + 28x_2 - 28x_3 &= 0 \\4x_1 + 8x_2 - 4x_3 &= 2\end{aligned}$$

## Rješenje

parametar

a)

$x_1$	$x_2$	$x_3$	
1	-3	5	1
4	28	-28	0 $/: 4$
4	8	-4	2 $/: 4$
1	-3	5	1
1	7	-7	0 $+$
1	2	-1	$\frac{1}{2} / \cdot (-7)$

$$\begin{aligned}x_1 - 3x_2 + 5x_3 &= 1 \\4x_1 + 28x_2 - 28x_3 &= 0 \\4x_1 + 8x_2 - 4x_3 &= 2\end{aligned}$$

## Rješenje

parametar

a)

$x_1$	$x_2$	$x_3$	
1	-3	5	1
4	28	-28	0 $/: 4$
4	8	-4	2 $/: 4$
1	-3	5	1
1	7	-7	0 $+$
1	2	-1	$\frac{1}{2} / \cdot (-7) / \cdot 5$

$$\begin{aligned}x_1 - 3x_2 + 5x_3 &= 1 \\4x_1 + 28x_2 - 28x_3 &= 0 \\4x_1 + 8x_2 - 4x_3 &= 2\end{aligned}$$



# Rješenje

parametar

a)

$x_1$	$x_2$	$x_3$	
1	-3	5	1
4	28	-28	0 $/: 4$
4	8	-4	2 $/: 4$
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<hr/>			
-6			
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parametar

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parametar

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$x_1$	$x_2$	$x_3$	
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parametar

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parametar

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$x_1$	$x_2$	$x_3$	
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parametar

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$x_1$	$x_2$	$x_3$	
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$$\begin{aligned}x_1 - 3x_2 + 5x_3 &= 1 \\4x_1 + 28x_2 - 28x_3 &= 0 \\4x_1 + 8x_2 - 4x_3 &= 2\end{aligned}$$

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$x_1$	$x_2$	$x_3$	
6	7	0	$\frac{7}{2}$
0			

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parametar

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$x_1$	$x_2$	$x_3$	
6	7	0	$\frac{7}{2}$
0	0		

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parametar

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$x_1$	$x_2$	$x_3$	
6	7	0	$\frac{7}{2}$
0	0	0	

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parametar

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$x_1$	$x_2$	$x_3$	
6	7	0	$\frac{7}{2}$
0	0	0	0

$$\begin{aligned}x_1 - 3x_2 + 5x_3 &= 1 \\4x_1 + 28x_2 - 28x_3 &= 0 \\4x_1 + 8x_2 - 4x_3 &= 2\end{aligned}$$

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parametar

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$x_1$	$x_2$	$x_3$	
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1	2	-1	$\frac{1}{2}$

$x_1$	$x_2$	$x_3$	
6	7	0	$\frac{7}{2}$
0	0	0	0
$-\frac{5}{7}$			

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parametar

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-6	-7	0	$-\frac{7}{2}$
1	2	-1	$\frac{1}{2}$

$x_1$	$x_2$	$x_3$	
6	7	0	$\frac{7}{2}$
0	0	0	0
$-\frac{5}{7}$	0		

$$\begin{aligned}x_1 - 3x_2 + 5x_3 &= 1 \\4x_1 + 28x_2 - 28x_3 &= 0 \\4x_1 + 8x_2 - 4x_3 &= 2\end{aligned}$$



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parametar

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1	2	-1	$\frac{1}{2}$

$x_1$	$x_2$	$x_3$	
6	7	0	$\frac{7}{2}$
0	0	0	0
$-\frac{5}{7}$	0	-1	

$$\begin{aligned}x_1 - 3x_2 + 5x_3 &= 1 \\4x_1 + 28x_2 - 28x_3 &= 0 \\4x_1 + 8x_2 - 4x_3 &= 2\end{aligned}$$

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parametar

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$x_1$	$x_2$	$x_3$	
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parametar

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parametar

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$$\begin{aligned}x_1 - 3x_2 + 5x_3 &= 1 \\4x_1 + 28x_2 - 28x_3 &= 0 \\4x_1 + 8x_2 - 4x_3 &= 2\end{aligned}$$

# Rješenje

parametar

suvišna  
jednadžba

$x_1$	$x_2$	$x_3$	
6	7	0	$\frac{7}{2}$
0	0	0	0
$-\frac{5}{7}$	0	-1	$-\frac{1}{2}$

a)

$x_1$	$x_2$	$x_3$	
1	-3	5	1
4	28	-28	0 $/: 4$
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# Rješenje

parametar

suvišna  
jednadžba

a)

$x_1$	$x_2$	$x_3$	
1	-3	5	1
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1	2	-1	$\frac{1}{2}$

$x_1$	$x_2$	$x_3$	
6	7	0	$\frac{7}{2}$
0	0	0	0
$-\frac{5}{7}$	0	-1	$-\frac{1}{2}$
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parametar

suvišna  
jednadžba

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6	7	0	$\frac{7}{2}$ $/ \cdot 1 / \cdot \frac{-2}{7}$
-6	-7	0	$-\frac{7}{2}$
1	2	-1	$\frac{1}{2}$

$x_1$	$x_2$	$x_3$	
6	7	0	$\frac{7}{2}$
0	0	0	0
$-\frac{5}{7}$	0	-1	$-\frac{1}{2}$
6	7	0	$\frac{7}{2}$
$-\frac{5}{7}$	0	-1	$-\frac{1}{2}$

$$\begin{aligned}x_1 - 3x_2 + 5x_3 &= 1 \\4x_1 + 28x_2 - 28x_3 &= 0 \\4x_1 + 8x_2 - 4x_3 &= 2\end{aligned}$$

# Rješenje

parametar

suvišna  
jednadžba

a)

$x_1$	$x_2$	$x_3$	
1	-3	5	1
4	28	-28	0 $/: 4$
4	8	-4	2 $/: 4$
1	-3	5	1
1	7	-7	0
1	2	-1	$\frac{1}{2}$ $/ \cdot (-7) / \cdot 5$
6	7	0	$\frac{7}{2}$ $/ \cdot 1 / \cdot \frac{-2}{7}$
-6	-7	0	$-\frac{7}{2}$
1	2	-1	$\frac{1}{2}$

$x_1$	$x_2$	$x_3$	
6	7	0	$\frac{7}{2}$
0	0	0	0
$-\frac{5}{7}$	0	-1	$-\frac{1}{2}$
6	7	0	$\frac{7}{2}$
$-\frac{5}{7}$	0	-1	$-\frac{1}{2}$

$6x_1$

$$\begin{aligned}x_1 - 3x_2 + 5x_3 &= 1 \\4x_1 + 28x_2 - 28x_3 &= 0 \\4x_1 + 8x_2 - 4x_3 &= 2\end{aligned}$$



# Rješenje

parametar

suvišna  
jednadžba

a)

$x_1$	$x_2$	$x_3$	
1	-3	5	1
4	28	-28	0 $/: 4$
4	8	-4	2 $/: 4$
1	-3	5	1
1	7	-7	0
1	2	-1	$\frac{1}{2}$
6	7	0	$\frac{7}{2}$
-6	-7	0	$-\frac{7}{2}$
1	2	-1	$\frac{1}{2}$

$+ \quad + \quad +$   
 $/ \cdot (-7) / \cdot 5$   
 $/ \cdot 1 / \cdot \frac{-2}{7}$   
 $+ \quad +$

$x_1$	$x_2$	$x_3$	
6	7	0	$\frac{7}{2}$
0	0	0	0
$-\frac{5}{7}$	0	-1	$-\frac{1}{2}$
6	7	0	$\frac{7}{2}$
$-\frac{5}{7}$	0	-1	$-\frac{1}{2}$

$$6x_1 + 7x_2$$

$$\begin{aligned} x_1 - 3x_2 + 5x_3 &= 1 \\ 4x_1 + 28x_2 - 28x_3 &= 0 \\ 4x_1 + 8x_2 - 4x_3 &= 2 \end{aligned}$$

# Rješenje

parametar

suvišna  
jednadžba

a)

$x_1$	$x_2$	$x_3$	
1	-3	5	1
4	28	-28	0 $/: 4$
4	8	-4	2 $/: 4$
1	-3	5	1
1	7	-7	0
1	2	-1	$\frac{1}{2}$ $/ \cdot (-7) / \cdot 5$
6	7	0	$\frac{7}{2}$ $/ \cdot 1 / \cdot \frac{-2}{7}$
-6	-7	0	$-\frac{7}{2}$
1	2	-1	$\frac{1}{2}$

$x_1$	$x_2$	$x_3$	
6	7	0	$\frac{7}{2}$
0	0	0	0
$-\frac{5}{7}$	0	-1	$-\frac{1}{2}$
6	7	0	$\frac{7}{2}$
$-\frac{5}{7}$	0	-1	$-\frac{1}{2}$

$$6x_1 + 7x_2 =$$

$$\begin{aligned} x_1 - 3x_2 + 5x_3 &= 1 \\ 4x_1 + 28x_2 - 28x_3 &= 0 \\ 4x_1 + 8x_2 - 4x_3 &= 2 \end{aligned}$$

# Rješenje

parametar

suvišna  
jednadžba

a)

$x_1$	$x_2$	$x_3$	
1	-3	5	1
4	28	-28	0 $/: 4$
4	8	-4	2 $/: 4$
1	-3	5	1
1	7	-7	0
1	2	-1	$\frac{1}{2}$ $/ \cdot (-7) / \cdot 5$
6	7	0	$\frac{7}{2}$ $/ \cdot 1 / \cdot \frac{-2}{7}$
-6	-7	0	$-\frac{7}{2}$
1	2	-1	$\frac{1}{2}$

$x_1$	$x_2$	$x_3$	
6	7	0	$\frac{7}{2}$
0	0	0	0
$-\frac{5}{7}$	0	-1	$-\frac{1}{2}$
6	7	0	$\frac{7}{2}$
$-\frac{5}{7}$	0	-1	$-\frac{1}{2}$

$$6x_1 + 7x_2 = \frac{7}{2}$$

$$\begin{aligned} x_1 - 3x_2 + 5x_3 &= 1 \\ 4x_1 + 28x_2 - 28x_3 &= 0 \\ 4x_1 + 8x_2 - 4x_3 &= 2 \end{aligned}$$

# Rješenje

parametar

suvišna  
jednadžba

a)

$x_1$	$x_2$	$x_3$	
1	-3	5	1
4	28	-28	0 $/: 4$
4	8	-4	2 $/: 4$
1	-3	5	1
1	7	-7	0
1	2	-1	$\frac{1}{2}$ $/ \cdot (-7) / \cdot 5$
6	7	0	$\frac{7}{2}$ $/ \cdot 1 / \cdot \frac{-2}{7}$
-6	-7	0	$-\frac{7}{2}$
1	2	-1	$\frac{1}{2}$

$x_1$	$x_2$	$x_3$	
6	7	0	$\frac{7}{2}$
0	0	0	0
$-\frac{5}{7}$	0	-1	$-\frac{1}{2}$
6	7	0	$\frac{7}{2}$
$-\frac{5}{7}$	0	-1	$-\frac{1}{2}$

$$6x_1 + 7x_2 = \frac{7}{2}$$

$$-\frac{5}{7}x_1$$

$$\begin{aligned} x_1 - 3x_2 + 5x_3 &= 1 \\ 4x_1 + 28x_2 - 28x_3 &= 0 \\ 4x_1 + 8x_2 - 4x_3 &= 2 \end{aligned}$$

# Rješenje

parametar

suvišna  
jednadžba

a)

$x_1$	$x_2$	$x_3$	
1	-3	5	1
4	28	-28	0 $/: 4$
4	8	-4	2 $/: 4$
1	-3	5	1
1	7	-7	0
1	2	-1	$\frac{1}{2}$ $/ \cdot (-7) / \cdot 5$
6	7	0	$\frac{7}{2}$ $/ \cdot 1 / \cdot \frac{-2}{7}$
-6	-7	0	$-\frac{7}{2}$
1	2	-1	$\frac{1}{2}$

$x_1$	$x_2$	$x_3$	
6	7	0	$\frac{7}{2}$
0	0	0	0
$-\frac{5}{7}$	0	-1	$-\frac{1}{2}$
6	7	0	$\frac{7}{2}$
$-\frac{5}{7}$	0	-1	$-\frac{1}{2}$

$$6x_1 + 7x_2 = \frac{7}{2}$$

$$-\frac{5}{7}x_1 - x_3$$

$$\begin{aligned} x_1 - 3x_2 + 5x_3 &= 1 \\ 4x_1 + 28x_2 - 28x_3 &= 0 \\ 4x_1 + 8x_2 - 4x_3 &= 2 \end{aligned}$$

# Rješenje

parametar

suvišna  
jednadžba

a)

$x_1$	$x_2$	$x_3$	
1	-3	5	1
4	28	-28	0 $/: 4$
4	8	-4	2 $/: 4$
1	-3	5	1
1	7	-7	0
1	2	-1	$\frac{1}{2}$ $/ \cdot (-7) / \cdot 5$
6	7	0	$\frac{7}{2}$ $/ \cdot 1 / \cdot \frac{-2}{7}$
-6	-7	0	$-\frac{7}{2}$
1	2	-1	$\frac{1}{2}$

$x_1$	$x_2$	$x_3$	
6	7	0	$\frac{7}{2}$
0	0	0	0
$-\frac{5}{7}$	0	-1	$-\frac{1}{2}$
6	7	0	$\frac{7}{2}$
$-\frac{5}{7}$	0	-1	$-\frac{1}{2}$

$$6x_1 + 7x_2 = \frac{7}{2}$$

$$-\frac{5}{7}x_1 - x_3 =$$

$$\begin{aligned} x_1 - 3x_2 + 5x_3 &= 1 \\ 4x_1 + 28x_2 - 28x_3 &= 0 \\ 4x_1 + 8x_2 - 4x_3 &= 2 \end{aligned}$$

# Rješenje

parametar

suvišna  
jednadžba

a)

$x_1$	$x_2$	$x_3$	
1	-3	5	1
4	28	-28	0 $/: 4$
4	8	-4	2 $/: 4$
1	-3	5	1
1	7	-7	0
1	2	-1	$\frac{1}{2}$ $/ \cdot (-7) / \cdot 5$
6	7	0	$\frac{7}{2}$ $/ \cdot 1 / \cdot \frac{-2}{7}$
-6	-7	0	$-\frac{7}{2}$
1	2	-1	$\frac{1}{2}$

$x_1$	$x_2$	$x_3$	
6	7	0	$\frac{7}{2}$
0	0	0	0
$-\frac{5}{7}$	0	-1	$-\frac{1}{2}$
6	7	0	$\frac{7}{2}$
$-\frac{5}{7}$	0	-1	$-\frac{1}{2}$

$$6x_1 + 7x_2 = \frac{7}{2}$$

$$-\frac{5}{7}x_1 - x_3 = -\frac{1}{2}$$

$$\begin{aligned} x_1 - 3x_2 + 5x_3 &= 1 \\ 4x_1 + 28x_2 - 28x_3 &= 0 \\ 4x_1 + 8x_2 - 4x_3 &= 2 \end{aligned}$$

# Rješenje

parametar

suvišna  
jednadžba

a)

$x_1$	$x_2$	$x_3$	
1	-3	5	1
4	28	-28	0 $/: 4$
4	8	-4	2 $/: 4$
1	-3	5	1
1	7	-7	0
1	2	-1	$\frac{1}{2}$ $/ \cdot (-7) / \cdot 5$
6	7	0	$\frac{7}{2}$ $/ \cdot 1 / \cdot \frac{-2}{7}$
-6	-7	0	$-\frac{7}{2}$
1	2	-1	$\frac{1}{2}$

$x_1$	$x_2$	$x_3$	
6	7	0	$\frac{7}{2}$
0	0	0	0
$-\frac{5}{7}$	0	-1	$-\frac{1}{2}$
6	7	0	$\frac{7}{2}$
$-\frac{5}{7}$	0	-1	$-\frac{1}{2}$

$$\left. \begin{aligned} 6x_1 + 7x_2 &= \frac{7}{2} \\ -\frac{5}{7}x_1 - x_3 &= -\frac{1}{2} \end{aligned} \right\}$$

$$\begin{aligned} x_1 - 3x_2 + 5x_3 &= 1 \\ 4x_1 + 28x_2 - 28x_3 &= 0 \\ 4x_1 + 8x_2 - 4x_3 &= 2 \end{aligned}$$



$$6x_1 + 7x_2 = \frac{7}{2}$$

$$-\frac{5}{7}x_1 - x_3 = -\frac{1}{2}$$

---

$$6x_1 + 7x_2 = \frac{7}{2} \quad \longrightarrow \quad 7x_2 =$$

$$-\frac{5}{7}x_1 - x_3 = -\frac{1}{2}$$

---

$$6x_1 + 7x_2 = \frac{7}{2} \longrightarrow 7x_2 = -6x_1 + \frac{7}{2}$$

$$\underline{-\frac{5}{7}x_1 - x_3 = -\frac{1}{2}}$$

$$6x_1 + 7x_2 = \frac{7}{2} \longrightarrow 7x_2 = -6x_1 + \frac{7}{2} \Big/ \cdot \frac{1}{7}$$

$$\underline{-\frac{5}{7}x_1 - x_3 = -\frac{1}{2}}$$

$$6x_1 + 7x_2 = \frac{7}{2} \longrightarrow 7x_2 = -6x_1 + \frac{7}{2} \Big/ \cdot \frac{1}{7} \longrightarrow x_2 =$$

$$\underline{-\frac{5}{7}x_1 - x_3 = -\frac{1}{2}}$$

$$6x_1 + 7x_2 = \frac{7}{2} \longrightarrow 7x_2 = -6x_1 + \frac{7}{2} \Big/ \cdot \frac{1}{7} \longrightarrow x_2 = -\frac{6}{7}x_1$$

$$\underline{-\frac{5}{7}x_1 - x_3 = -\frac{1}{2}}$$

$$6x_1 + 7x_2 = \frac{7}{2} \longrightarrow 7x_2 = -6x_1 + \frac{7}{2} \Big/ \cdot \frac{1}{7} \longrightarrow x_2 = -\frac{6}{7}x_1 + \frac{1}{2}$$

$$\underline{-\frac{5}{7}x_1 - x_3 = -\frac{1}{2}}$$

$$6x_1 + 7x_2 = \frac{7}{2} \longrightarrow 7x_2 = -6x_1 + \frac{7}{2} \Big/ \cdot \frac{1}{7} \longrightarrow x_2 = -\frac{6}{7}x_1 + \frac{1}{2}$$

$$\underline{-\frac{5}{7}x_1 - x_3 = -\frac{1}{2}} \longrightarrow -x_3 =$$



$$6x_1 + 7x_2 = \frac{7}{2} \longrightarrow 7x_2 = -6x_1 + \frac{7}{2} \Big/ \cdot \frac{1}{7} \longrightarrow x_2 = -\frac{6}{7}x_1 + \frac{1}{2}$$

$$\underline{-\frac{5}{7}x_1 - x_3 = -\frac{1}{2}} \longrightarrow -x_3 = \frac{5}{7}x_1 - \frac{1}{2}$$

$$6x_1 + 7x_2 = \frac{7}{2} \longrightarrow 7x_2 = -6x_1 + \frac{7}{2} \Big/ \cdot \frac{1}{7} \longrightarrow x_2 = -\frac{6}{7}x_1 + \frac{1}{2}$$

$$\underline{-\frac{5}{7}x_1 - x_3 = -\frac{1}{2}} \longrightarrow -x_3 = \frac{5}{7}x_1 - \frac{1}{2} \Big/ \cdot (-1)$$

$$6x_1 + 7x_2 = \frac{7}{2} \longrightarrow 7x_2 = -6x_1 + \frac{7}{2} \Big/ \cdot \frac{1}{7} \longrightarrow x_2 = -\frac{6}{7}x_1 + \frac{1}{2}$$

$$\underline{-\frac{5}{7}x_1 - x_3 = -\frac{1}{2}} \longrightarrow -x_3 = \frac{5}{7}x_1 - \frac{1}{2} \Big/ \cdot (-1) \longrightarrow x_3 =$$

$$6x_1 + 7x_2 = \frac{7}{2} \longrightarrow 7x_2 = -6x_1 + \frac{7}{2} \Big/ \cdot \frac{1}{7} \longrightarrow x_2 = -\frac{6}{7}x_1 + \frac{1}{2}$$

$$\underline{-\frac{5}{7}x_1 - x_3 = -\frac{1}{2}} \longrightarrow -x_3 = \frac{5}{7}x_1 - \frac{1}{2} \Big/ \cdot (-1) \longrightarrow x_3 = -\frac{5}{7}x_1$$

$$6x_1 + 7x_2 = \frac{7}{2} \longrightarrow 7x_2 = -6x_1 + \frac{7}{2} \Big/ \cdot \frac{1}{7} \longrightarrow x_2 = -\frac{6}{7}x_1 + \frac{1}{2}$$

$$\underline{-\frac{5}{7}x_1 - x_3 = -\frac{1}{2}} \longrightarrow -x_3 = \frac{5}{7}x_1 - \frac{1}{2} \Big/ \cdot (-1) \longrightarrow x_3 = -\frac{5}{7}x_1 + \frac{1}{2}$$

$$6x_1 + 7x_2 = \frac{7}{2} \longrightarrow 7x_2 = -6x_1 + \frac{7}{2} \Big/ \cdot \frac{1}{7} \longrightarrow x_2 = -\frac{6}{7}x_1 + \frac{1}{2}$$

$$\underline{-\frac{5}{7}x_1 - x_3 = -\frac{1}{2}} \longrightarrow -x_3 = \frac{5}{7}x_1 - \frac{1}{2} \Big/ \cdot (-1) \longrightarrow x_3 = -\frac{5}{7}x_1 + \frac{1}{2}$$

$$\begin{array}{l}
 6x_1 + 7x_2 = \frac{7}{2} \longrightarrow 7x_2 = -6x_1 + \frac{7}{2} \Big/ \cdot \frac{1}{7} \longrightarrow x_2 = -\frac{6}{7}x_1 + \frac{1}{2} \\
 \underline{-\frac{5}{7}x_1 - x_3 = -\frac{1}{2}} \longrightarrow -x_3 = \frac{5}{7}x_1 - \frac{1}{2} \Big/ \cdot (-1) \longrightarrow x_3 = -\frac{5}{7}x_1 + \frac{1}{2}
 \end{array}$$

Opće rješenje sustava

$$\begin{array}{l}
 6x_1 + 7x_2 = \frac{7}{2} \longrightarrow 7x_2 = -6x_1 + \frac{7}{2} \Big/ \cdot \frac{1}{7} \longrightarrow x_2 = -\frac{6}{7}x_1 + \frac{1}{2} \\
 -\frac{5}{7}x_1 - x_3 = -\frac{1}{2} \longrightarrow -x_3 = \frac{5}{7}x_1 - \frac{1}{2} \Big/ \cdot (-1) \longrightarrow x_3 = -\frac{5}{7}x_1 + \frac{1}{2}
 \end{array}$$

Opće rješenje sustava

1. način zapisivanja



$$\begin{array}{l}
 6x_1 + 7x_2 = \frac{7}{2} \quad \longrightarrow \quad 7x_2 = -6x_1 + \frac{7}{2} \quad \bigg/ \cdot \frac{1}{7} \quad \longrightarrow \quad x_2 = -\frac{6}{7}x_1 + \frac{1}{2} \\
 -\frac{5}{7}x_1 - x_3 = -\frac{1}{2} \quad \longrightarrow \quad -x_3 = \frac{5}{7}x_1 - \frac{1}{2} \quad \bigg/ \cdot (-1) \quad \longrightarrow \quad x_3 = -\frac{5}{7}x_1 + \frac{1}{2}
 \end{array}$$

Opće rješenje sustava

### 1. način zapisivanja

$$x_2 = -\frac{6}{7}x_1 + \frac{1}{2}$$

$$x_3 = -\frac{5}{7}x_1 + \frac{1}{2}$$

$$\begin{array}{l}
 6x_1 + 7x_2 = \frac{7}{2} \quad \longrightarrow \quad 7x_2 = -6x_1 + \frac{7}{2} \quad \Big/ \cdot \frac{1}{7} \quad \longrightarrow \quad x_2 = -\frac{6}{7}x_1 + \frac{1}{2} \\
 -\frac{5}{7}x_1 - x_3 = -\frac{1}{2} \quad \longrightarrow \quad -x_3 = \frac{5}{7}x_1 - \frac{1}{2} \quad \Big/ \cdot (-1) \quad \longrightarrow \quad x_3 = -\frac{5}{7}x_1 + \frac{1}{2}
 \end{array}$$

Opće rješenje sustava

### 1. način zapisivanja

$$x_2 = -\frac{6}{7}x_1 + \frac{1}{2}$$

$$x_3 = -\frac{5}{7}x_1 + \frac{1}{2}$$

$$x_1 \in \mathbb{R}$$

$$\begin{array}{lcl}
 6x_1 + 7x_2 = \frac{7}{2} & \longrightarrow & 7x_2 = -6x_1 + \frac{7}{2} \bigg/ \cdot \frac{1}{7} \longrightarrow x_2 = -\frac{6}{7}x_1 + \frac{1}{2} \\
 -\frac{5}{7}x_1 - x_3 = -\frac{1}{2} & \longrightarrow & -x_3 = \frac{5}{7}x_1 - \frac{1}{2} \bigg/ \cdot (-1) \longrightarrow x_3 = -\frac{5}{7}x_1 + \frac{1}{2}
 \end{array}$$

Opće rješenje sustava

1. način zapisivanja

$$x_2 = -\frac{6}{7}x_1 + \frac{1}{2}$$

$$x_3 = -\frac{5}{7}x_1 + \frac{1}{2}$$

$$x_1 \in \mathbb{R}$$

2. način zapisivanja

$$\begin{array}{l}
 6x_1 + 7x_2 = \frac{7}{2} \longrightarrow 7x_2 = -6x_1 + \frac{7}{2} \Big/ \cdot \frac{1}{7} \longrightarrow x_2 = -\frac{6}{7}x_1 + \frac{1}{2} \\
 -\frac{5}{7}x_1 - x_3 = -\frac{1}{2} \longrightarrow -x_3 = \frac{5}{7}x_1 - \frac{1}{2} \Big/ \cdot (-1) \longrightarrow x_3 = -\frac{5}{7}x_1 + \frac{1}{2}
 \end{array}$$

Opće rješenje sustava

1. način zapisivanja

$$x_2 = -\frac{6}{7}x_1 + \frac{1}{2}$$

$$x_3 = -\frac{5}{7}x_1 + \frac{1}{2}$$

$$x_1 \in \mathbb{R}$$

2. način zapisivanja

$$x_1 =$$

$$x_2 =$$

$$x_3 =$$

$$\begin{array}{l}
 6x_1 + 7x_2 = \frac{7}{2} \longrightarrow 7x_2 = -6x_1 + \frac{7}{2} \Big/ \cdot \frac{1}{7} \longrightarrow x_2 = -\frac{6}{7}x_1 + \frac{1}{2} \\
 -\frac{5}{7}x_1 - x_3 = -\frac{1}{2} \longrightarrow -x_3 = \frac{5}{7}x_1 - \frac{1}{2} \Big/ \cdot (-1) \longrightarrow x_3 = -\frac{5}{7}x_1 + \frac{1}{2}
 \end{array}$$

Opće rješenje sustava

1. način zapisivanja

$$x_2 = -\frac{6}{7}x_1 + \frac{1}{2}$$

$$x_3 = -\frac{5}{7}x_1 + \frac{1}{2}$$

$$x_1 \in \mathbb{R}$$

2. način zapisivanja

$$x_1 = p$$

$$x_2 =$$

$$x_3 =$$

$$\begin{array}{l}
 6x_1 + 7x_2 = \frac{7}{2} \quad \longrightarrow \quad 7x_2 = -6x_1 + \frac{7}{2} \quad \Big/ \cdot \frac{1}{7} \quad \longrightarrow \quad x_2 = -\frac{6}{7}x_1 + \frac{1}{2} \\
 -\frac{5}{7}x_1 - x_3 = -\frac{1}{2} \quad \longrightarrow \quad -x_3 = \frac{5}{7}x_1 - \frac{1}{2} \quad \Big/ \cdot (-1) \quad \longrightarrow \quad x_3 = -\frac{5}{7}x_1 + \frac{1}{2}
 \end{array}$$

Opće rješenje sustava

1. način zapisivanja

$$x_2 = -\frac{6}{7}x_1 + \frac{1}{2}$$

$$x_3 = -\frac{5}{7}x_1 + \frac{1}{2}$$

$$x_1 \in \mathbb{R}$$

2. način zapisivanja

$$x_1 = p$$

$$x_2 = -\frac{6}{7}p + \frac{1}{2}$$

$$x_3 =$$

$$\begin{array}{l}
 6x_1 + 7x_2 = \frac{7}{2} \quad \longrightarrow \quad 7x_2 = -6x_1 + \frac{7}{2} \quad \bigg/ \cdot \frac{1}{7} \quad \longrightarrow \quad x_2 = -\frac{6}{7}x_1 + \frac{1}{2} \\
 -\frac{5}{7}x_1 - x_3 = -\frac{1}{2} \quad \longrightarrow \quad -x_3 = \frac{5}{7}x_1 - \frac{1}{2} \quad \bigg/ \cdot (-1) \quad \longrightarrow \quad x_3 = -\frac{5}{7}x_1 + \frac{1}{2}
 \end{array}$$

Opće rješenje sustava

1. način zapisivanja

$$x_2 = -\frac{6}{7}x_1 + \frac{1}{2}$$

$$x_3 = -\frac{5}{7}x_1 + \frac{1}{2}$$

$$x_1 \in \mathbb{R}$$

2. način zapisivanja

$$x_1 = p$$

$$x_2 = -\frac{6}{7}p + \frac{1}{2}$$

$$x_3 = -\frac{5}{7}p + \frac{1}{2}$$

$$\begin{array}{lcl}
 6x_1 + 7x_2 = \frac{7}{2} & \longrightarrow & 7x_2 = -6x_1 + \frac{7}{2} \Big/ \cdot \frac{1}{7} \longrightarrow x_2 = -\frac{6}{7}x_1 + \frac{1}{2} \\
 -\frac{5}{7}x_1 - x_3 = -\frac{1}{2} & \longrightarrow & -x_3 = \frac{5}{7}x_1 - \frac{1}{2} \Big/ \cdot (-1) \longrightarrow x_3 = -\frac{5}{7}x_1 + \frac{1}{2}
 \end{array}$$

Opće rješenje sustava

1. način zapisivanja

$$x_2 = -\frac{6}{7}x_1 + \frac{1}{2}$$

$$x_3 = -\frac{5}{7}x_1 + \frac{1}{2}$$

$$x_1 \in \mathbb{R}$$

2. način zapisivanja

$$x_1 = p$$

$$x_2 = -\frac{6}{7}p + \frac{1}{2}$$

$$x_3 = -\frac{5}{7}p + \frac{1}{2}$$

$$p \in \mathbb{R}$$



$$\begin{array}{l}
 6x_1 + 7x_2 = \frac{7}{2} \quad \longrightarrow \quad 7x_2 = -6x_1 + \frac{7}{2} \quad \bigg/ \cdot \frac{1}{7} \quad \longrightarrow \quad x_2 = -\frac{6}{7}x_1 + \frac{1}{2} \\
 -\frac{5}{7}x_1 - x_3 = -\frac{1}{2} \quad \longrightarrow \quad -x_3 = \frac{5}{7}x_1 - \frac{1}{2} \quad \bigg/ \cdot (-1) \quad \longrightarrow \quad x_3 = -\frac{5}{7}x_1 + \frac{1}{2}
 \end{array}$$

Opće rješenje sustava

1. način zapisivanja

$$x_2 = -\frac{6}{7}x_1 + \frac{1}{2}$$

$$x_3 = -\frac{5}{7}x_1 + \frac{1}{2}$$

$$x_1 \in \mathbb{R}$$

2. način zapisivanja

$$x_1 = p$$

$$x_2 = -\frac{6}{7}p + \frac{1}{2}$$

$$x_3 = -\frac{5}{7}p + \frac{1}{2}$$

$$p \in \mathbb{R}$$

3. način zapisivanja

$$\begin{array}{l}
 6x_1 + 7x_2 = \frac{7}{2} \quad \longrightarrow \quad 7x_2 = -6x_1 + \frac{7}{2} \quad \Big/ \cdot \frac{1}{7} \quad \longrightarrow \quad x_2 = -\frac{6}{7}x_1 + \frac{1}{2} \\
 -\frac{5}{7}x_1 - x_3 = -\frac{1}{2} \quad \longrightarrow \quad -x_3 = \frac{5}{7}x_1 - \frac{1}{2} \quad \Big/ \cdot (-1) \quad \longrightarrow \quad x_3 = -\frac{5}{7}x_1 + \frac{1}{2}
 \end{array}$$

Opće rješenje sustava

1. način zapisivanja

$$x_2 = -\frac{6}{7}x_1 + \frac{1}{2}$$

$$x_3 = -\frac{5}{7}x_1 + \frac{1}{2}$$

$$x_1 \in \mathbb{R}$$

2. način zapisivanja

$$x_1 = p$$

$$x_2 = -\frac{6}{7}p + \frac{1}{2}$$

$$x_3 = -\frac{5}{7}p + \frac{1}{2}$$

$$p \in \mathbb{R}$$

3. način zapisivanja

$$(p,$$

$$\begin{array}{l}
 6x_1 + 7x_2 = \frac{7}{2} \quad \longrightarrow \quad 7x_2 = -6x_1 + \frac{7}{2} \quad \Big/ \cdot \frac{1}{7} \quad \longrightarrow \quad x_2 = -\frac{6}{7}x_1 + \frac{1}{2} \\
 -\frac{5}{7}x_1 - x_3 = -\frac{1}{2} \quad \longrightarrow \quad -x_3 = \frac{5}{7}x_1 - \frac{1}{2} \quad \Big/ \cdot (-1) \quad \longrightarrow \quad x_3 = -\frac{5}{7}x_1 + \frac{1}{2}
 \end{array}$$

Opće rješenje sustava

1. način zapisivanja

$$x_2 = -\frac{6}{7}x_1 + \frac{1}{2}$$

$$x_3 = -\frac{5}{7}x_1 + \frac{1}{2}$$

$$x_1 \in \mathbb{R}$$

2. način zapisivanja

$$x_1 = p$$

$$x_2 = -\frac{6}{7}p + \frac{1}{2}$$

$$x_3 = -\frac{5}{7}p + \frac{1}{2}$$

$$p \in \mathbb{R}$$

3. način zapisivanja

$$\left( p, -\frac{6}{7}p + \frac{1}{2}, \right.$$

$$\begin{array}{l}
 6x_1 + 7x_2 = \frac{7}{2} \quad \longrightarrow \quad 7x_2 = -6x_1 + \frac{7}{2} \quad \bigg/ \cdot \frac{1}{7} \quad \longrightarrow \quad x_2 = -\frac{6}{7}x_1 + \frac{1}{2} \\
 -\frac{5}{7}x_1 - x_3 = -\frac{1}{2} \quad \longrightarrow \quad -x_3 = \frac{5}{7}x_1 - \frac{1}{2} \quad \bigg/ \cdot (-1) \quad \longrightarrow \quad x_3 = -\frac{5}{7}x_1 + \frac{1}{2}
 \end{array}$$

Opće rješenje sustava

1. način zapisivanja

$$x_2 = -\frac{6}{7}x_1 + \frac{1}{2}$$

$$x_3 = -\frac{5}{7}x_1 + \frac{1}{2}$$

$$x_1 \in \mathbb{R}$$

2. način zapisivanja

$$x_1 = p$$

$$x_2 = -\frac{6}{7}p + \frac{1}{2}$$

$$x_3 = -\frac{5}{7}p + \frac{1}{2}$$

$$p \in \mathbb{R}$$

3. način zapisivanja

$$\left( p, -\frac{6}{7}p + \frac{1}{2}, -\frac{5}{7}p + \frac{1}{2} \right)$$

$$\begin{array}{lcl}
 6x_1 + 7x_2 = \frac{7}{2} & \longrightarrow & 7x_2 = -6x_1 + \frac{7}{2} \bigg/ \cdot \frac{1}{7} \longrightarrow x_2 = -\frac{6}{7}x_1 + \frac{1}{2} \\
 -\frac{5}{7}x_1 - x_3 = -\frac{1}{2} & \longrightarrow & -x_3 = \frac{5}{7}x_1 - \frac{1}{2} \bigg/ \cdot (-1) \longrightarrow x_3 = -\frac{5}{7}x_1 + \frac{1}{2}
 \end{array}$$

Opće rješenje sustava

1. način zapisivanja

$$x_2 = -\frac{6}{7}x_1 + \frac{1}{2}$$

$$x_3 = -\frac{5}{7}x_1 + \frac{1}{2}$$

$$x_1 \in \mathbb{R}$$

2. način zapisivanja

$$x_1 = p$$

$$x_2 = -\frac{6}{7}p + \frac{1}{2}$$

$$x_3 = -\frac{5}{7}p + \frac{1}{2}$$

$$p \in \mathbb{R}$$

3. način zapisivanja

$$\left( p, -\frac{6}{7}p + \frac{1}{2}, -\frac{5}{7}p + \frac{1}{2} \right)$$

$$p \in \mathbb{R}$$

b) Bazična rješenja

$$x_1 = p$$

$$x_2 = -\frac{6}{7}p + \frac{1}{2}$$

$$x_3 = -\frac{5}{7}p + \frac{1}{2}$$

b) Bazična rješenja

$$x_1 = 0$$

$$x_1 = p$$

$$x_2 = -\frac{6}{7}p + \frac{1}{2}$$

$$x_3 = -\frac{5}{7}p + \frac{1}{2}$$

b) Bazična rješenja

$$x_1 = 0$$

$$p = 0$$

$$x_1 = p$$

$$x_2 = -\frac{6}{7}p + \frac{1}{2}$$

$$x_3 = -\frac{5}{7}p + \frac{1}{2}$$



b) Bazična rješenja

$$x_1 = 0$$

$$p = 0$$

$$\left(0, \frac{1}{2}, \frac{1}{2}\right)$$

$$x_1 = p$$

$$x_2 = -\frac{6}{7}p + \frac{1}{2}$$

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b) Bazična rješenja

$$x_1 = 0$$

$$x_2 = 0$$

$$p = 0$$

$$\left(0, \frac{1}{2}, \frac{1}{2}\right)$$

$$x_1 = p$$

$$x_2 = -\frac{6}{7}p + \frac{1}{2}$$

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$$x_2 = -\frac{6}{7}p + \frac{1}{2}$$

$$x_3 = -\frac{5}{7}p + \frac{1}{2}$$

b) Bazična rješenja

$$x_1 = 0$$

$$x_2 = 0$$

$$p = 0$$

$$-\frac{6}{7}p + \frac{1}{2} = 0$$

$$\left(0, \frac{1}{2}, \frac{1}{2}\right)$$

$$x_1 = p$$

$$x_2 = -\frac{6}{7}p + \frac{1}{2}$$

$$x_3 = -\frac{5}{7}p + \frac{1}{2}$$

b) Bazična rješenja

$$x_1 = 0$$

$$x_2 = 0$$

$$p = 0$$

$$-\frac{6}{7}p + \frac{1}{2} = 0 \quad / \cdot 14$$

$$\left(0, \frac{1}{2}, \frac{1}{2}\right)$$

$$x_1 = p$$

$$x_2 = -\frac{6}{7}p + \frac{1}{2}$$

$$x_3 = -\frac{5}{7}p + \frac{1}{2}$$

b) Bazična rješenja

$$x_1 = 0$$

$$p = 0$$

$$\left(0, \frac{1}{2}, \frac{1}{2}\right)$$

$$x_2 = 0$$

$$-\frac{6}{7}p + \frac{1}{2} = 0 \quad / \cdot 14$$

$$-12p + 7 = 0$$

$$x_1 = p$$

$$x_2 = -\frac{6}{7}p + \frac{1}{2}$$

$$x_3 = -\frac{5}{7}p + \frac{1}{2}$$

b) Bazična rješenja

$$x_1 = 0$$

$$p = 0$$

$$\left(0, \frac{1}{2}, \frac{1}{2}\right)$$

$$x_2 = 0$$

$$-\frac{6}{7}p + \frac{1}{2} = 0 \quad / \cdot 14$$

$$-12p + 7 = 0$$

$$p = \frac{7}{12}$$

$$x_1 = p$$

$$x_2 = -\frac{6}{7}p + \frac{1}{2}$$

$$x_3 = -\frac{5}{7}p + \frac{1}{2}$$

b) Bazična rješenja

$$x_1 = 0$$

$$p = 0$$

$$\left(0, \frac{1}{2}, \frac{1}{2}\right)$$

$$x_2 = 0$$

$$-\frac{6}{7}p + \frac{1}{2} = 0 \quad / \cdot 14$$

$$-12p + 7 = 0$$

$$p = \frac{7}{12}$$

$$\left(\frac{7}{12}, 0, \frac{1}{12}\right)$$



$$x_1 = p$$

$$x_2 = -\frac{6}{7}p + \frac{1}{2}$$

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$$p = 0$$

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$$x_2 = 0$$

$$-\frac{6}{7}p + \frac{1}{2} = 0 \quad / \cdot 14$$

$$-12p + 7 = 0$$

$$p = \frac{7}{12}$$

$$\left(\frac{7}{12}, 0, \frac{1}{12}\right)$$

$$x_1 = p$$

$$x_2 = -\frac{6}{7}p + \frac{1}{2}$$

$$x_3 = -\frac{5}{7}p + \frac{1}{2}$$

b) Bazična rješenja

$$x_1 = 0$$

$$p = 0$$

$$\left(0, \frac{1}{2}, \frac{1}{2}\right)$$

$$x_2 = 0$$

$$-\frac{6}{7}p + \frac{1}{2} = 0 \quad / \cdot 14$$

$$-12p + 7 = 0$$

$$p = \frac{7}{12}$$

$$\left(\frac{7}{12}, 0, \frac{1}{12}\right)$$

$$x_3 = 0$$

$$x_1 = p$$

$$x_2 = -\frac{6}{7}p + \frac{1}{2}$$

$$x_3 = -\frac{5}{7}p + \frac{1}{2}$$

b) Bazična rješenja

$$x_1 = 0$$

$$p = 0$$

$$\left(0, \frac{1}{2}, \frac{1}{2}\right)$$

$$x_2 = 0$$

$$-\frac{6}{7}p + \frac{1}{2} = 0 \quad / \cdot 14$$

$$-12p + 7 = 0$$

$$p = \frac{7}{12}$$

$$\left(\frac{7}{12}, 0, \frac{1}{12}\right)$$

$$x_3 = 0$$

$$-\frac{5}{7}p + \frac{1}{2} = 0$$

$$x_1 = p$$

$$x_2 = -\frac{6}{7}p + \frac{1}{2}$$

$$x_3 = -\frac{5}{7}p + \frac{1}{2}$$

b) Bazična rješenja

$$x_1 = 0$$

$$p = 0$$

$$\left(0, \frac{1}{2}, \frac{1}{2}\right)$$

$$x_2 = 0$$

$$-\frac{6}{7}p + \frac{1}{2} = 0 \quad / \cdot 14$$

$$-12p + 7 = 0$$

$$p = \frac{7}{12}$$

$$\left(\frac{7}{12}, 0, \frac{1}{12}\right)$$

$$x_3 = 0$$

$$-\frac{5}{7}p + \frac{1}{2} = 0 \quad / \cdot 14$$

$$x_1 = p$$

$$x_2 = -\frac{6}{7}p + \frac{1}{2}$$

$$x_3 = -\frac{5}{7}p + \frac{1}{2}$$

b) Bazična rješenja

$$x_1 = 0$$

$$p = 0$$

$$\left(0, \frac{1}{2}, \frac{1}{2}\right)$$

$$x_2 = 0$$

$$-\frac{6}{7}p + \frac{1}{2} = 0 \quad / \cdot 14$$

$$-12p + 7 = 0$$

$$p = \frac{7}{12}$$

$$\left(\frac{7}{12}, 0, \frac{1}{12}\right)$$

$$x_3 = 0$$

$$-\frac{5}{7}p + \frac{1}{2} = 0 \quad / \cdot 14$$

$$-10p + 7 = 0$$

$$x_1 = p$$

$$x_2 = -\frac{6}{7}p + \frac{1}{2}$$

$$x_3 = -\frac{5}{7}p + \frac{1}{2}$$

b) Bazična rješenja

$$x_1 = 0$$

$$p = 0$$

$$\left(0, \frac{1}{2}, \frac{1}{2}\right)$$

$$x_2 = 0$$

$$-\frac{6}{7}p + \frac{1}{2} = 0 \quad / \cdot 14$$

$$-12p + 7 = 0$$

$$p = \frac{7}{12}$$

$$\left(\frac{7}{12}, 0, \frac{1}{12}\right)$$

$$x_3 = 0$$

$$-\frac{5}{7}p + \frac{1}{2} = 0 \quad / \cdot 14$$

$$-10p + 7 = 0$$

$$p = \frac{7}{10}$$

$$x_1 = p$$

$$x_2 = -\frac{6}{7}p + \frac{1}{2}$$

$$x_3 = -\frac{5}{7}p + \frac{1}{2}$$

b) Bazična rješenja

$$x_1 = 0$$

$$p = 0$$

$$\left(0, \frac{1}{2}, \frac{1}{2}\right)$$

$$x_2 = 0$$

$$-\frac{6}{7}p + \frac{1}{2} = 0 \quad / \cdot 14$$

$$-12p + 7 = 0$$

$$p = \frac{7}{12}$$

$$\left(\frac{7}{12}, 0, \frac{1}{12}\right)$$

$$x_3 = 0$$

$$-\frac{5}{7}p + \frac{1}{2} = 0 \quad / \cdot 14$$

$$-10p + 7 = 0$$

$$p = \frac{7}{10}$$

$$\left(\frac{7}{10}, -\frac{1}{10}, 0\right)$$

$$x_1 = p$$

$$x_2 = -\frac{6}{7}p + \frac{1}{2}$$

$$x_3 = -\frac{5}{7}p + \frac{1}{2}$$

b) Bazična rješenja

$$x_1 = 0$$

$$p = 0$$

$$\left(0, \frac{1}{2}, \frac{1}{2}\right)$$

$$x_2 = 0$$

$$-\frac{6}{7}p + \frac{1}{2} = 0 \quad / \cdot 14$$

$$-12p + 7 = 0$$

$$p = \frac{7}{12}$$

$$\left(\frac{7}{12}, 0, \frac{1}{12}\right)$$

$$x_3 = 0$$

$$-\frac{5}{7}p + \frac{1}{2} = 0 \quad / \cdot 14$$

$$-10p + 7 = 0$$

$$p = \frac{7}{10}$$

$$\left(\frac{7}{10}, -\frac{1}{10}, 0\right)$$



c)

$$x_1 = p$$

$$x_2 = -\frac{6}{7}p + \frac{1}{2}$$

$$x_3 = -\frac{5}{7}p + \frac{1}{2}$$

c)

$$x_1 + x_2 + x_3 = 0$$

$$x_1 = p$$

$$x_2 = -\frac{6}{7}p + \frac{1}{2}$$

$$x_3 = -\frac{5}{7}p + \frac{1}{2}$$

c)

$$x_1 + x_2 + x_3 = 0$$

$p$

$$x_1 = p$$

$$x_2 = -\frac{6}{7}p + \frac{1}{2}$$

$$x_3 = -\frac{5}{7}p + \frac{1}{2}$$

c)

$$x_1 + x_2 + x_3 = 0$$

$p +$

$$x_1 = p$$

$$x_2 = -\frac{6}{7}p + \frac{1}{2}$$

$$x_3 = -\frac{5}{7}p + \frac{1}{2}$$

c)

$$x_1 + x_2 + x_3 = 0$$

$$p + \left(-\frac{6}{7}p + \frac{1}{2}\right)$$

$$x_1 = p$$

$$x_2 = -\frac{6}{7}p + \frac{1}{2}$$

$$x_3 = -\frac{5}{7}p + \frac{1}{2}$$

c)

$$x_1 + x_2 + x_3 = 0$$

$$p + \left(-\frac{6}{7}p + \frac{1}{2}\right) +$$

$$x_1 = p$$

$$x_2 = -\frac{6}{7}p + \frac{1}{2}$$

$$x_3 = -\frac{5}{7}p + \frac{1}{2}$$

c)

$$x_1 + x_2 + x_3 = 0$$

$$p + \left(-\frac{6}{7}p + \frac{1}{2}\right) + \left(-\frac{5}{7}p + \frac{1}{2}\right)$$

$$x_1 = p$$

$$x_2 = -\frac{6}{7}p + \frac{1}{2}$$

$$x_3 = -\frac{5}{7}p + \frac{1}{2}$$

c)

$$x_1 + x_2 + x_3 = 0$$

$$p + \left(-\frac{6}{7}p + \frac{1}{2}\right) + \left(-\frac{5}{7}p + \frac{1}{2}\right) = 0$$

$$x_1 = p$$

$$x_2 = -\frac{6}{7}p + \frac{1}{2}$$

$$x_3 = -\frac{5}{7}p + \frac{1}{2}$$



c)

$$x_1 + x_2 + x_3 = 0$$

$$p + \left(-\frac{6}{7}p + \frac{1}{2}\right) + \left(-\frac{5}{7}p + \frac{1}{2}\right) = 0$$

$$-\frac{4}{7}p + 1 = 0$$

$$x_1 = p$$

$$x_2 = -\frac{6}{7}p + \frac{1}{2}$$

$$x_3 = -\frac{5}{7}p + \frac{1}{2}$$

c)

$$x_1 + x_2 + x_3 = 0$$

$$p + \left(-\frac{6}{7}p + \frac{1}{2}\right) + \left(-\frac{5}{7}p + \frac{1}{2}\right) = 0$$

$$-\frac{4}{7}p + 1 = 0$$

$$p = \frac{7}{4}$$

$$x_1 = p$$

$$x_2 = -\frac{6}{7}p + \frac{1}{2}$$

$$x_3 = -\frac{5}{7}p + \frac{1}{2}$$

c)

$$x_1 + x_2 + x_3 = 0$$

$$p + \left(-\frac{6}{7}p + \frac{1}{2}\right) + \left(-\frac{5}{7}p + \frac{1}{2}\right) = 0$$

$$-\frac{4}{7}p + 1 = 0$$

$$p = \frac{7}{4}$$

$$x_1 = p$$

$$x_2 = -\frac{6}{7}p + \frac{1}{2}$$

$$x_3 = -\frac{5}{7}p + \frac{1}{2}$$

c)

$$x_1 + x_2 + x_3 = 0$$

$$p + \left(-\frac{6}{7}p + \frac{1}{2}\right) + \left(-\frac{5}{7}p + \frac{1}{2}\right) = 0$$

$$-\frac{4}{7}p + 1 = 0$$

$$p = \frac{7}{4}$$

$$x_1 = p$$

$$x_2 = -\frac{6}{7}p + \frac{1}{2}$$

$$x_3 = -\frac{5}{7}p + \frac{1}{2}$$

Traženo rješenje sustava

c)

$$x_1 + x_2 + x_3 = 0$$

$$p + \left(-\frac{6}{7}p + \frac{1}{2}\right) + \left(-\frac{5}{7}p + \frac{1}{2}\right) = 0$$

$$-\frac{4}{7}p + 1 = 0$$

$$p = \frac{7}{4}$$

$$x_1 = p$$

$$x_2 = -\frac{6}{7}p + \frac{1}{2}$$

$$x_3 = -\frac{5}{7}p + \frac{1}{2}$$

Traženo rješenje sustava

c)

$$x_1 + x_2 + x_3 = 0$$

$$p + \left(-\frac{6}{7}p + \frac{1}{2}\right) + \left(-\frac{5}{7}p + \frac{1}{2}\right) = 0$$

$$-\frac{4}{7}p + 1 = 0$$

$$p = \frac{7}{4}$$

$$x_1 = p$$

$$x_2 = -\frac{6}{7}p + \frac{1}{2}$$

$$x_3 = -\frac{5}{7}p + \frac{1}{2}$$

Traženo rješenje sustava

$$x_1 = \frac{7}{4}$$

c)

$$x_1 + x_2 + x_3 = 0$$

$$p + \left(-\frac{6}{7}p + \frac{1}{2}\right) + \left(-\frac{5}{7}p + \frac{1}{2}\right) = 0$$

$$-\frac{4}{7}p + 1 = 0$$

$$p = \frac{7}{4}$$

$$x_1 = p$$

$$x_2 = -\frac{6}{7}p + \frac{1}{2}$$

$$x_3 = -\frac{5}{7}p + \frac{1}{2}$$

Traženo rješenje sustava

$$x_1 = \frac{7}{4}, \quad x_2 = -1$$

c)

$$x_1 + x_2 + x_3 = 0$$

$$p + \left(-\frac{6}{7}p + \frac{1}{2}\right) + \left(-\frac{5}{7}p + \frac{1}{2}\right) = 0$$

$$-\frac{4}{7}p + 1 = 0$$

$$p = \frac{7}{4}$$

$$x_1 = p$$

$$x_2 = -\frac{6}{7}p + \frac{1}{2}$$

$$x_3 = -\frac{5}{7}p + \frac{1}{2}$$

Traženo rješenje sustava

$$x_1 = \frac{7}{4}, \quad x_2 = -1, \quad x_3 = -\frac{3}{4}$$



c)

$$x_1 + x_2 + x_3 = 0$$

$$p + \left(-\frac{6}{7}p + \frac{1}{2}\right) + \left(-\frac{5}{7}p + \frac{1}{2}\right) = 0$$

$$-\frac{4}{7}p + 1 = 0$$

$$p = \frac{7}{4}$$

$$x_1 = p$$

$$x_2 = -\frac{6}{7}p + \frac{1}{2}$$

$$x_3 = -\frac{5}{7}p + \frac{1}{2}$$

Traženo rješenje sustava  $\left(\frac{7}{4}, -1, -\frac{3}{4}\right)$

$$x_1 = \frac{7}{4}, \quad x_2 = -1, \quad x_3 = -\frac{3}{4}$$

# Broj parametara u rješivom sustavu

$$\begin{array}{|c|} \hline \text{broj} \\ \text{parametara} \\ \hline \end{array} = \begin{array}{|c|} \hline \text{broj} \\ \text{nepoznanica} \\ \hline \end{array} - \begin{array}{|c|} \hline \text{broj nezavisnih} \\ \text{jednadžbi} \\ \hline \end{array}$$

# Broj parametara u rješivom sustavu

nakon provedenog  
Gaussovog postupka  
znamo taj podatak



**broj  
parametara**

=

**broj  
nepoznanica**

—

**broj nezavisnih  
jednadžbi**

# Broj parametara u rješivom sustavu

U prethodnom zadatku

$$\text{broj parametara} = 3 - 2 = 1$$

nakon provedenog  
Gaussovog postupka  
znamo taj podatak



broj  
parametara

=

broj  
nepoznanica

—

broj nezavisnih  
jednadžbi

# Broj parametara u rješivom sustavu

U prethodnom zadatku

$$\text{broj parametara} = 3 - 2 = 1$$

broj  
parametara

=

broj  
nepoznanica

—

broj nezavisnih  
jednadžbi

nakon provedenog  
Gaussovog postupka  
znamo taj podatak



taj podatak je  
povezan s rangom  
matrice sustava

# Broj parametara u rješivom sustavu

U prethodnom zadatku

broj parametara =  $3 - 2 = 1$

nakon provedenog  
Gaussovog postupka  
znamo taj podatak



broj  
parametara

=

broj  
nepoznanica

—

broj nezavisnih  
jednadžbi



Kronecker-Capellijev  
teorem



taj podatak je  
povezan s rangom  
matrice sustava

**Strpite se.**

Predivni Kronecker-Capellijev  
teorem i rang matrice radit ćemo  
na sljedećim seminarima.



## treći zadatak

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### Zadatak 3

*Riješite sustav linearnih jednadžbi*

$$x_1 - 4x_2 + 5x_3 = 6$$

$$-3x_2 + 2x_3 = -12.$$

$$2x_1 + 7x_2 = 35$$

## Rješenje

$x_1$	$x_2$	$x_3$	

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## Rješenje

$x_1$	$x_2$	$x_3$	
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0	-3	2	

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
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Riješite sustav linearnih jednažbi


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Riješite sustav linearnih jednadžbi


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
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0			



## Zadatak 3

Riješite sustav linearnih jednačbi


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0	-3	2	-12
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0	15		



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
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<hr/>			
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0	15	-10	



## Zadatak 3

Riješite sustav linearnih jednačbi


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
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
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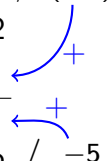
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<hr/>			
1			
0	-3	2	-12

Diagram illustrating row operations:

- Row 1 is multiplied by -2.
- Row 2 is added to Row 1.
- Row 3 is added to Row 1.
- Row 2 is multiplied by  $\frac{-5}{2}$  and then by 5.
- Row 3 is added to Row 2.

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1	$\frac{7}{2}$	0	36
0	-3	2	-12
0	0	0	-37

Diagram showing row operations with blue arrows and plus signs:

- Row 1  $\rightarrow$  Row 3 (+)
- Row 1  $\rightarrow$  Row 4 (+)
- Row 2  $\rightarrow$  Row 5 (+)
- Row 2  $\rightarrow$  Row 6 (+)

Final row highlighted in red:  $0 \quad 0 \quad 0 \quad -37$

Result:  $0 = -37$

sustav je kontradiktoran

## Zadatak 3

Riješite sustav linearnih jednažbi

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## čtvrtí zadatak

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## Zadatak 4

*Gaussovim postupkom pronađite inverznu matricu matrice*

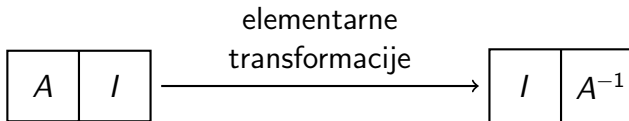
$$A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & -3 & 2 \\ -2 & 6 & -1 \end{bmatrix}.$$

## Zadatak 4

*Gaussovim postupkom pronađite inverznu matricu matrice*

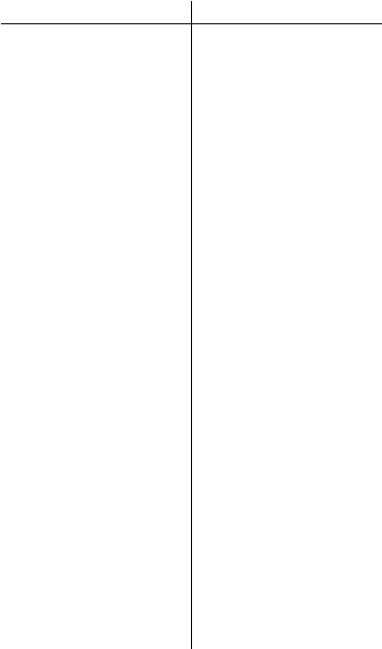
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## Rješenje



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2    3    1

$$A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & -3 & 2 \\ -2 & 6 & -1 \end{bmatrix}$$

2	3	1
1	-3	2

$$A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & -3 & 2 \\ -2 & 6 & -1 \end{bmatrix}$$

2	3	1
1	-3	2
-2	6	-1

$$A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & -3 & 2 \\ -2 & 6 & -1 \end{bmatrix}$$

2	3	1	1	0	0
1	-3	2			
-2	6	-1			

$$A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & -3 & 2 \\ -2 & 6 & -1 \end{bmatrix}$$

2	3	1	1	0	0
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2	3	1	1	0	0
1	-3	2	0	1	0
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2	3	1	1	0	0
1	-3	2	0	1	0
-2	6	-1	0	0	1

$$A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & -3 & 2 \\ -2 & 6 & -1 \end{bmatrix}$$



2	3	1	1	0	0
①	-3	2	0	1	0
-2	6	-1	0	0	1

$$A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & -3 & 2 \\ -2 & 6 & -1 \end{bmatrix}$$

2	3	1	1	0	0	
①	-3	2	0	1	0	$/ \cdot (-2)$
-2	6	-1	0	0	1	

$$A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & -3 & 2 \\ -2 & 6 & -1 \end{bmatrix}$$

2	3	1	1	0	0	$\leftarrow +$
① -2	-3	2	0	1	0	$/ \cdot (-2)$
-2	6	-1	0	0	1	

$$A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & -3 & 2 \\ -2 & 6 & -1 \end{bmatrix}$$

2	3	1	1	0	0	
①	-3	2	0	1	0	$\leftarrow +$ $/ \cdot (-2) / \cdot 2$
-2	6	-1	0	0	1	

$$A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & -3 & 2 \\ -2 & 6 & -1 \end{bmatrix}$$

2	3	1	1	0	0	$\leftarrow +$
①	-3	2	0	1	0	$/ \cdot (-2) / \cdot 2$
-2	6	-1	0	0	1	$\leftarrow +$

$$A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & -3 & 2 \\ -2 & 6 & -1 \end{bmatrix}$$

2	3	1	1	0	0	$\leftarrow +$
①	-3	2	0	1	0	$/ \cdot (-2) / \cdot 2$
-2	6	-1	0	0	1	$\leftarrow +$

1	-3	2	0	1	0
---	----	---	---	---	---

$$A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & -3 & 2 \\ -2 & 6 & -1 \end{bmatrix}$$

2	3	1	1	0	0	$\leftarrow +$
①	-3	2	0	1	0	$/ \cdot (-2) / \cdot 2$
-2	6	-1	0	0	1	$\leftarrow +$
0						
1	-3	2	0	1	0	

$$A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & -3 & 2 \\ -2 & 6 & -1 \end{bmatrix}$$

2	3	1	1	0	0	← <sup>+</sup>
①	-3	2	0	1	0	$/ \cdot (-2) / \cdot 2$
-2	6	-1	0	0	1	← <sup>+</sup>
0	9					
1	-3	2	0	1	0	

$$A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & -3 & 2 \\ -2 & 6 & -1 \end{bmatrix}$$



2	3	1	1	0	0	$\leftarrow +$
① -3	2	0	1	0	0	$\leftarrow / \cdot (-2) / \cdot 2$
-2	6	-1	0	0	1	$\leftarrow +$
0	9	-3				
1	-3	2	0	1	0	

$$A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & -3 & 2 \\ -2 & 6 & -1 \end{bmatrix}$$

2	3	1	1	0	0	$\leftarrow +$
① -3	2	0	1	0	0	$/ \cdot (-2) / \cdot 2$
-2	6	-1	0	0	1	$\leftarrow +$
0	9	-3	1			
1	-3	2	0	1	0	

$$A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & -3 & 2 \\ -2 & 6 & -1 \end{bmatrix}$$

2	3	1	1	0	0	$\leftarrow +$
① -3	2	0	1	0	0	$/ \cdot (-2) / \cdot 2$
-2	6	-1	0	0	1	$\leftarrow +$
0	9	-3	1	-2		
1	-3	2	0	1	0	

$$A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & -3 & 2 \\ -2 & 6 & -1 \end{bmatrix}$$

2	3	1	1	0	0	$\leftarrow +$
① -3	2	0	1	0	0	$/ \cdot (-2) / \cdot 2$
-2	6	-1	0	0	1	$\leftarrow +$
0	9	-3	1	-2	0	
1	-3	2	0	1	0	

$$A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & -3 & 2 \\ -2 & 6 & -1 \end{bmatrix}$$

2	3	1	1	0	0	$\leftarrow +$
① -2	-3	2	0	1	0	$\leftarrow \cdot (-2) \cdot 2$
-2	6	-1	0	0	1	$\leftarrow +$
0	9	-3	1	-2	0	
1	-3	2	0	1	0	
0						

$$A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & -3 & 2 \\ -2 & 6 & -1 \end{bmatrix}$$

2	3	1	1	0	0	$\leftarrow +$
① -3	2	0	1	0	0	$\leftarrow / \cdot (-2) / \cdot 2$
-2	6	-1	0	0	1	$\leftarrow +$
0	9	-3	1	-2	0	
1	-3	2	0	1	0	
0	0					

$$A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & -3 & 2 \\ -2 & 6 & -1 \end{bmatrix}$$

2	3	1	1	0	0	$\leftarrow +$
① -3	2	0	1	0	0	$/ \cdot (-2) / \cdot 2$
-2	6	-1	0	0	1	$\leftarrow +$
0	9	-3	1	-2	0	
1	-3	2	0	1	0	
0	0	3				

$$A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & -3 & 2 \\ -2 & 6 & -1 \end{bmatrix}$$

2	3	1	1	0	0	$\leftarrow +$
① -2	-3	2	0	1	0	$/ \cdot (-2) / \cdot 2$
-2	6	-1	0	0	1	$\leftarrow +$
0	9	-3	1	-2	0	
1	-3	2	0	1	0	
0	0	3	0			

$$A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & -3 & 2 \\ -2 & 6 & -1 \end{bmatrix}$$



2	3	1	1	0	0	$\leftarrow +$
① -3	2	0	1	0	0	$\div \cdot (-2) \div \cdot 2$
-2	6	-1	0	0	1	$\leftarrow +$
0	9	-3	1	-2	0	
1	-3	2	0	1	0	
0	0	3	0	2		

$$A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & -3 & 2 \\ -2 & 6 & -1 \end{bmatrix}$$

2	3	1	1	0	0	$\leftarrow +$
① -2	-3	2	0	1	0	$\leftarrow / \cdot (-2) / \cdot 2$
-2	6	-1	0	0	1	$\leftarrow +$
0	9	-3	1	-2	0	
1	-3	2	0	1	0	
0	0	3	0	2	1	

$$A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & -3 & 2 \\ -2 & 6 & -1 \end{bmatrix}$$

2	3	1	1	0	0	$\leftarrow +$
① -2	-3	2	0	1	0	$\leftarrow / \cdot (-2) / \cdot 2$
-2	6	-1	0	0	1	$\leftarrow +$
0	9	-3	1	-2	0	
1	-3	2	0	1	0	
0	0	3	0	2	1	

$$A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & -3 & 2 \\ -2 & 6 & -1 \end{bmatrix}$$

2	3	1	1	0	0	$\leftarrow +$
① -2	-3	2	0	1	0	$\div \cdot (-2) \div \cdot 2$
-2	6	-1	0	0	1	$\leftarrow +$
0	9	-3	1	-2	0	$\div : 9$
1	-3	2	0	1	0	
0	0	3	0	2	1	

$$A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & -3 & 2 \\ -2 & 6 & -1 \end{bmatrix}$$

2	3	1	1	0	0	$\leftarrow +$
① -2	-3	2	0	1	0	$\div \cdot (-2) \div \cdot 2$
-2	6	-1	0	0	1	$\leftarrow +$
0	9	-3	1	-2	0	$\div : 9$
1	-3	2	0	1	0	
0	0	3	0	2	1	
0						

$$A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & -3 & 2 \\ -2 & 6 & -1 \end{bmatrix}$$

2	3	1	1	0	0	$\leftarrow +$
① -2	-3	2	0	1	0	$\div \cdot (-2) \div \cdot 2$
-2	6	-1	0	0	1	$\leftarrow +$
0	9	-3	1	-2	0	$\div : 9$
1	-3	2	0	1	0	
0	0	3	0	2	1	
0	1					

$$A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & -3 & 2 \\ -2 & 6 & -1 \end{bmatrix}$$

2	3	1	1	0	0	$\leftarrow +$
① -3	2	0	1	0	0	$\div \cdot (-2) \div \cdot 2$
-2	6	-1	0	0	1	$\leftarrow +$
0	9	-3	1	-2	0	$\div : 9$
1	-3	2	0	1	0	
0	0	3	0	2	1	
0	1	$-\frac{1}{3}$				

$$A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & -3 & 2 \\ -2 & 6 & -1 \end{bmatrix}$$

2	3	1	1	0	0	$\leftarrow +$
① -3	2	0	1	0	0	$\div \cdot (-2) \div \cdot 2$
-2	6	-1	0	0	1	$\leftarrow +$
0	9	-3	1	-2	0	$\div : 9$
1	-3	2	0	1	0	
0	0	3	0	2	1	
0	1	$-\frac{1}{3}$	$\frac{1}{9}$			

$$A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & -3 & 2 \\ -2 & 6 & -1 \end{bmatrix}$$



2	3	1	1	0	0	$\leftarrow +$
① -3	2	0	1	0	0	$\div \cdot (-2) \div \cdot 2$
-2	6	-1	0	0	1	$\leftarrow +$
0	9	-3	1	-2	0	$\div : 9$
1	-3	2	0	1	0	
0	0	3	0	2	1	
0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$		

$$A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & -3 & 2 \\ -2 & 6 & -1 \end{bmatrix}$$

2	3	1	1	0	0	$\leftarrow +$
① -2	-3	2	0	1	0	$\div \cdot (-2) \div \cdot 2$
-2	6	-1	0	0	1	$\leftarrow +$
0	9	-3	1	-2	0	$\div : 9$
1	-3	2	0	1	0	
0	0	3	0	2	1	
0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0	

$$A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & -3 & 2 \\ -2 & 6 & -1 \end{bmatrix}$$

2	3	1	1	0	0	$\leftarrow +$
① -3	2	0	1	0	0	$\div \cdot (-2) \div \cdot 2$
-2	6	-1	0	0	1	$\leftarrow +$
0	9	-3	1	-2	0	$\div : 9$
1	-3	2	0	1	0	
0	0	3	0	2	1	
0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0	
1	-3	2	0	1	0	

$$A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & -3 & 2 \\ -2 & 6 & -1 \end{bmatrix}$$

2	3	1	1	0	0	$\leftarrow +$
① -3	2	0	1	0	0	$/ \cdot (-2) / \cdot 2$
-2	6	-1	0	0	1	$\leftarrow +$
0	9	-3	1	-2	0	$/ : 9$
1	-3	2	0	1	0	
0	0	3	0	2	1	
0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0	
1	-3	2	0	1	0	
0	0	3	0	2	1	

$$A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & -3 & 2 \\ -2 & 6 & -1 \end{bmatrix}$$

2	3	1	1	0	0	$\leftarrow +$
① -3	2	0	1	0	0	$\div \cdot (-2) \div \cdot 2$
-2	6	-1	0	0	1	$\leftarrow +$
0	9	-3	1	-2	0	$\div : 9$
1	-3	2	0	1	0	
0	0	3	0	2	1	
0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0	
1	-3	2	0	1	0	
0	0	3	0	2	1	

$$A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & -3 & 2 \\ -2 & 6 & -1 \end{bmatrix}$$

2	3	1	1	0	0	$\leftarrow +$
①	-3	2	0	1	0	$/ \cdot (-2) / \cdot 2$
-2	6	-1	0	0	1	$\leftarrow +$
0	9	-3	1	-2	0	$/ : 9$
1	-3	2	0	1	0	
0	0	3	0	2	1	
0	①	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0	
1	-3	2	0	1	0	
0	0	3	0	2	1	

$$A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & -3 & 2 \\ -2 & 6 & -1 \end{bmatrix}$$

2	3	1	1	0	0	$\leftarrow +$
①	-3	2	0	1	0	$/ \cdot (-2) / \cdot 2$
-2	6	-1	0	0	1	$\leftarrow +$
0	9	-3	1	-2	0	$/ : 9$
1	-3	2	0	1	0	
0	0	3	0	2	1	
0	①	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0	$/ \cdot 3$
1	-3	2	0	1	0	
0	0	3	0	2	1	

$$A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & -3 & 2 \\ -2 & 6 & -1 \end{bmatrix}$$

2	3	1	1	0	0	$\leftarrow +$
①	-3	2	0	1	0	$/ \cdot (-2) / \cdot 2$
-2	6	-1	0	0	1	$\leftarrow +$
0	9	-3	1	-2	0	$/ : 9$
1	-3	2	0	1	0	
0	0	3	0	2	1	
0	①	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0	$/ \cdot 3$
1	-3	2	0	1	0	$\leftarrow +$
0	0	3	0	2	1	

$$A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & -3 & 2 \\ -2 & 6 & -1 \end{bmatrix}$$



2	3	1	1	0	0	$\leftarrow +$
①	-3	2	0	1	0	$/ \cdot (-2) / \cdot 2$
-2	6	-1	0	0	1	$\leftarrow +$
0	9	-3	1	-2	0	$/ : 9$
1	-3	2	0	1	0	
0	0	3	0	2	1	
0	①	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0	$/ \cdot 3$
1	-3	2	0	1	0	$\leftarrow +$
0	0	3	0	2	1	
0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0	

$$A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & -3 & 2 \\ -2 & 6 & -1 \end{bmatrix}$$

2	3	1	1	0	0	$\leftarrow +$
①	-3	2	0	1	0	$/ \cdot (-2) / \cdot 2$
-2	6	-1	0	0	1	$\leftarrow +$
0	9	-3	1	-2	0	$/ : 9$
1	-3	2	0	1	0	
0	0	3	0	2	1	
0	①	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0	$/ \cdot 3$
1	-3	2	0	1	0	$\leftarrow +$
0	0	3	0	2	1	
0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0	
1						

$$A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & -3 & 2 \\ -2 & 6 & -1 \end{bmatrix}$$

2	3	1	1	0	0	$\leftarrow +$
① -3	2	0	1	0	0	$/ \cdot (-2) / \cdot 2$
-2	6	-1	0	0	1	$\leftarrow +$
0	9	-3	1	-2	0	$/ : 9$
1	-3	2	0	1	0	
0	0	3	0	2	1	
0	① - $\frac{1}{3}$	$-\frac{1}{9}$	$\frac{1}{9}$	$-\frac{2}{9}$	0	$/ \cdot 3$
1	-3	2	0	1	0	$\leftarrow +$
0	0	3	0	2	1	
0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0	
1	0					

$$A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & -3 & 2 \\ -2 & 6 & -1 \end{bmatrix}$$

2	3	1	1	0	0	$\leftarrow +$
① -3	2	0	1	0	$\div \cdot (-2) \div \cdot 2$	
-2	6	-1	0	0	1	$\leftarrow +$
0	9	-3	1	-2	0	$\div : 9$
1	-3	2	0	1	0	
0	0	3	0	2	1	
0	① - $\frac{1}{3}$	$-\frac{1}{9}$	$-\frac{2}{9}$	0	$\div \cdot 3$	
1	-3	2	0	1	0	$\leftarrow +$
0	0	3	0	2	1	
0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0	
1	0	1				

$$A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & -3 & 2 \\ -2 & 6 & -1 \end{bmatrix}$$

2	3	1	1	0	0	$\leftarrow +$
① -3	2	0	1	0	0	$\div \cdot (-2) \div \cdot 2$
-2	6	-1	0	0	1	$\leftarrow +$
0	9	-3	1	-2	0	$\div : 9$
1	-3	2	0	1	0	
0	0	3	0	2	1	
0	① - $\frac{1}{3}$	$\frac{1}{9}$	- $\frac{2}{9}$	0	0	$\div \cdot 3$
1	-3	2	0	1	0	$\leftarrow +$
0	0	3	0	2	1	
0	1	- $\frac{1}{3}$	$\frac{1}{9}$	- $\frac{2}{9}$	0	
1	0	1	$\frac{1}{3}$			

$$A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & -3 & 2 \\ -2 & 6 & -1 \end{bmatrix}$$

2	3	1	1	0	0	$\leftarrow +$
① -3	2	0	1	0	0	$/ \cdot (-2) / \cdot 2$
-2	6	-1	0	0	1	$\leftarrow +$
0	9	-3	1	-2	0	$/ : 9$
1	-3	2	0	1	0	
0	0	3	0	2	1	
0	① - $\frac{1}{3}$	$-\frac{1}{9}$	$\frac{1}{9}$	$-\frac{2}{9}$	0	$/ \cdot 3$
1	-3	2	0	1	0	$\leftarrow +$
0	0	3	0	2	1	
0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0	
1	0	1	$\frac{1}{3}$	$\frac{1}{3}$		

$$A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & -3 & 2 \\ -2 & 6 & -1 \end{bmatrix}$$

2	3	1	1	0	0	$\leftarrow +$
① -3	2	0	1	0	0	$\div \cdot (-2) \div \cdot 2$
-2	6	-1	0	0	1	$\leftarrow +$
0	9	-3	1	-2	0	$\div : 9$
1	-3	2	0	1	0	
0	0	3	0	2	1	
0	① - $\frac{1}{3}$	$-\frac{1}{9}$	$\frac{1}{9}$	$-\frac{2}{9}$	0	$\div \cdot 3$
1	-3	2	0	1	0	$\leftarrow +$
0	0	3	0	2	1	
0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0	
1	0	1	$\frac{1}{3}$	$\frac{1}{3}$	0	

$$A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & -3 & 2 \\ -2 & 6 & -1 \end{bmatrix}$$

2	3	1	1	0	0	$\leftarrow +$
① -3	2	0	1	0	0	$\leftarrow / \cdot (-2) / \cdot 2$
-2	6	-1	0	0	1	$\leftarrow +$
0	9	-3	1	-2	0	$\leftarrow / : 9$
1	-3	2	0	1	0	
0	0	3	0	2	1	
0	① - $\frac{1}{3}$	$-\frac{1}{9}$	$\frac{1}{9}$	$-\frac{2}{9}$	0	$\leftarrow / \cdot 3$
1	-3	2	0	1	0	$\leftarrow +$
0	0	3	0	2	1	
0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0	
1	0	1	$\frac{1}{3}$	$\frac{1}{3}$	0	
0	0	3	0	2	1	

$$A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & -3 & 2 \\ -2 & 6 & -1 \end{bmatrix}$$



2	3	1	1	0	0	$\leftarrow +$
① -3	2	0	1	0	0	$\leftarrow \cdot (-2) \cdot 2$
-2	6	-1	0	0	1	$\leftarrow +$
0	9	-3	1	-2	0	$\leftarrow : 9$
1	-3	2	0	1	0	
0	0	3	0	2	1	
0	① - $\frac{1}{3}$	$-\frac{1}{9}$	$\frac{1}{9}$	$-\frac{2}{9}$	0	$\leftarrow \cdot 3$
1	-3	2	0	1	0	$\leftarrow +$
0	0	3	0	2	1	
0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0	
1	0	1	$\frac{1}{3}$	$\frac{1}{3}$	0	
0	0	3	0	2	1	

$$A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & -3 & 2 \\ -2 & 6 & -1 \end{bmatrix}$$

2	3	1	1	0	0	$\leftarrow +$
① -3	2	0	1	0	0	$\div \cdot (-2) \div \cdot 2$
-2	6	-1	0	0	1	$\leftarrow +$
0	9	-3	1	-2	0	$\div : 9$
1	-3	2	0	1	0	
0	0	3	0	2	1	
0	① - $\frac{1}{3}$	$-\frac{1}{9}$	$\frac{1}{9}$	$-\frac{2}{9}$	0	$\div \cdot 3$
1	-3	2	0	1	0	$\leftarrow +$
0	0	3	0	2	1	
0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0	
1	0	1	$\frac{1}{3}$	$\frac{1}{3}$	0	
0	0	3	0	2	1	$\div : 3$

$$A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & -3 & 2 \\ -2 & 6 & -1 \end{bmatrix}$$

0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0
1	0	1	$\frac{1}{3}$	$\frac{1}{3}$	0
0	0	3	0	2	1 $/: 3$

0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0
---	---	----------------	---------------	----------------	---

0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0
1	0	1	$\frac{1}{3}$	$\frac{1}{3}$	0
0	0	3	0	2	1 $/: 3$

0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0
1	0	1	$\frac{1}{3}$	$\frac{1}{3}$	0

0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0
1	0	1	$\frac{1}{3}$	$\frac{1}{3}$	0
0	0	3	0	2	1 $/: 3$

0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0
1	0	1	$\frac{1}{3}$	$\frac{1}{3}$	0
0					

0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0
1	0	1	$\frac{1}{3}$	$\frac{1}{3}$	0
0	0	3	0	2	1 $/: 3$

0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0
1	0	1	$\frac{1}{3}$	$\frac{1}{3}$	0
0	0				

0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0
1	0	1	$\frac{1}{3}$	$\frac{1}{3}$	0
0	0	3	0	2	1 $/: 3$

0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0
1	0	1	$\frac{1}{3}$	$\frac{1}{3}$	0
0	0	1			

0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0
1	0	1	$\frac{1}{3}$	$\frac{1}{3}$	0
0	0	3	0	2	1 $/: 3$



0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0
1	0	1	$\frac{1}{3}$	$\frac{1}{3}$	0
0	0	1	0		

0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0
1	0	1	$\frac{1}{3}$	$\frac{1}{3}$	0
0	0	3	0	2	1 $/: 3$

0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0
1	0	1	$\frac{1}{3}$	$\frac{1}{3}$	0
0	0	1	0	$\frac{2}{3}$	

0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0
1	0	1	$\frac{1}{3}$	$\frac{1}{3}$	0
0	0	3	0	2	1 $/: 3$

0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0
1	0	1	$\frac{1}{3}$	$\frac{1}{3}$	0
0	0	1	0	$\frac{2}{3}$	$\frac{1}{3}$

0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0
1	0	1	$\frac{1}{3}$	$\frac{1}{3}$	0
0	0	3	0	2	1 $/: 3$

0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0
1	0	1	$\frac{1}{3}$	$\frac{1}{3}$	0
0	0	1	0	$\frac{2}{3}$	$\frac{1}{3}$

0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0
1	0	1	$\frac{1}{3}$	$\frac{1}{3}$	0
0	0	3	0	2	1 $/: 3$

0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0
1	0	1	$\frac{1}{3}$	$\frac{1}{3}$	0
0	0	①	0	$\frac{2}{3}$	$\frac{1}{3}$

0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0	
1	0	1	$\frac{1}{3}$	$\frac{1}{3}$	0	
0	0	①	0	$\frac{2}{3}$	$\frac{1}{3}$	$/ \cdot (-1)$

0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0	
1	0	1	$\frac{1}{3}$	$\frac{1}{3}$	0	$\leftarrow +$
0	0	①	0	$\frac{2}{3}$	$\frac{1}{3}$	$/ \cdot (-1)$

0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0	
1	0	1	$\frac{1}{3}$	$\frac{1}{3}$	0	$\leftarrow +$
0	0	①	0	$\frac{2}{3}$	$\frac{1}{3}$	$/ \cdot (-1) / \cdot \frac{1}{3}$



0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0	
1	0	1	$\frac{1}{3}$	$\frac{1}{3}$	0	
0	0	①	0	$\frac{2}{3}$	$\frac{1}{3}$	$/\cdot(-1) \quad /\cdot\frac{1}{3}$

0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0	
1	0	1	$\frac{1}{3}$	$\frac{1}{3}$	0	
0	0	①	0	$\frac{2}{3}$	$\frac{1}{3}$	$/\cdot(-1) \quad /\cdot\frac{1}{3}$

0	0	1	0	$\frac{2}{3}$	$\frac{1}{3}$
---	---	---	---	---------------	---------------

0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0	
1	0	1	$\frac{1}{3}$	$\frac{1}{3}$	0	
0	0	①	0	$\frac{2}{3}$	$\frac{1}{3}$	$/\cdot (-1) \quad /\cdot \frac{1}{3}$

1						
0	0	1	0	$\frac{2}{3}$	$\frac{1}{3}$	

0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0	
1	0	1	$\frac{1}{3}$	$\frac{1}{3}$	0	
0	0	①	0	$\frac{2}{3}$	$\frac{1}{3}$	$/\cdot(-1) \quad /\cdot\frac{1}{3}$

1	0					
0	0	1	0	$\frac{2}{3}$	$\frac{1}{3}$	

0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0	
1	0	1	$\frac{1}{3}$	$\frac{1}{3}$	0	
0	0	①	0	$\frac{2}{3}$	$\frac{1}{3}$	$/\cdot(-1) \quad /\cdot\frac{1}{3}$

1	0	0				
0	0	1	0	$\frac{2}{3}$	$\frac{1}{3}$	

0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0	
1	0	1	$\frac{1}{3}$	$\frac{1}{3}$	0	
0	0	①	0	$\frac{2}{3}$	$\frac{1}{3}$	$/\cdot(-1) \quad /\cdot\frac{1}{3}$

1	0	0	$\frac{1}{3}$			
0	0	1	0	$\frac{2}{3}$	$\frac{1}{3}$	

0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0	
1	0	1	$\frac{1}{3}$	$\frac{1}{3}$	0	
0	0	①	0	$\frac{2}{3}$	$\frac{1}{3}$	$/\cdot(-1) \quad /\cdot\frac{1}{3}$

1	0	0	$\frac{1}{3}$	$-\frac{1}{3}$	
0	0	1	0	$\frac{2}{3}$	$\frac{1}{3}$

0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0	
1	0	1	$\frac{1}{3}$	$\frac{1}{3}$	0	
0	0	①	0	$\frac{2}{3}$	$\frac{1}{3}$	$/ \cdot (-1) / \cdot \frac{1}{3}$

1	0	0	$\frac{1}{3}$	$-\frac{1}{3}$	$-\frac{1}{3}$	
0	0	1	0	$\frac{2}{3}$	$\frac{1}{3}$	



0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0	
1	0	1	$\frac{1}{3}$	$\frac{1}{3}$	0	
0	0	①	0	$\frac{2}{3}$	$\frac{1}{3}$	$/ \cdot (-1) / \cdot \frac{1}{3}$

0						
1	0	0	$\frac{1}{3}$	$-\frac{1}{3}$	$-\frac{1}{3}$	
0	0	1	0	$\frac{2}{3}$	$\frac{1}{3}$	

0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0	
1	0	1	$\frac{1}{3}$	$\frac{1}{3}$	0	
0	0	①	0	$\frac{2}{3}$	$\frac{1}{3}$	$/ \cdot (-1) / \cdot \frac{1}{3}$

0	1					
1	0	0	$\frac{1}{3}$	$-\frac{1}{3}$	$-\frac{1}{3}$	
0	0	1	0	$\frac{2}{3}$	$\frac{1}{3}$	

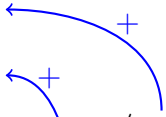


0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0	
1	0	1	$\frac{1}{3}$	$\frac{1}{3}$	0	
0	0	①	0	$\frac{2}{3}$	$\frac{1}{3}$	$/\cdot(-1) \quad /\cdot\frac{1}{3}$
0	1	0				
1	0	0	$\frac{1}{3}$	$-\frac{1}{3}$	$-\frac{1}{3}$	
0	0	1	0	$\frac{2}{3}$	$\frac{1}{3}$	

0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0	
1	0	1	$\frac{1}{3}$	$\frac{1}{3}$	0	
0	0	①	0	$\frac{2}{3}$	$\frac{1}{3}$	$/\cdot(-1) \quad /\cdot\frac{1}{3}$
0	1	0	$\frac{1}{9}$			
1	0	0	$\frac{1}{3}$	$-\frac{1}{3}$	$-\frac{1}{3}$	
0	0	1	0	$\frac{2}{3}$	$\frac{1}{3}$	

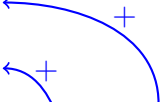


0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0	
1	0	1	$\frac{1}{3}$	$\frac{1}{3}$	0	
0	0	①	0	$\frac{2}{3}$	$\frac{1}{3}$	$/\cdot(-1) \quad / \cdot \frac{1}{3}$
0	1	0	$\frac{1}{9}$	0		
1	0	0	$\frac{1}{3}$	$-\frac{1}{3}$	$-\frac{1}{3}$	
0	0	1	0	$\frac{2}{3}$	$\frac{1}{3}$	

0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0	
1	0	1	$\frac{1}{3}$	$\frac{1}{3}$	0	
0	0	①	0	$\frac{2}{3}$	$\frac{1}{3}$	$/\cdot(-1) \quad / \cdot \frac{1}{3}$
0	1	0	$\frac{1}{9}$	0	$\frac{1}{9}$	
1	0	0	$\frac{1}{3}$	$-\frac{1}{3}$	$-\frac{1}{3}$	
0	0	1	0	$\frac{2}{3}$	$\frac{1}{3}$	

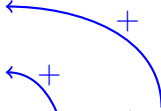

0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0	 $/. (-1) /.$ $\frac{1}{3}$
1	0	1	$\frac{1}{3}$	$\frac{1}{3}$	0	
0	0	①	0	$\frac{2}{3}$	$\frac{1}{3}$	
0	1	0	$\frac{1}{9}$	0	$\frac{1}{9}$	
1	0	0	$\frac{1}{3}$	$-\frac{1}{3}$	$-\frac{1}{3}$	
0	0	1	0	$\frac{2}{3}$	$\frac{1}{3}$	

0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0	  $/ \cdot (-1) / \cdot \frac{1}{3}$
1	0	1	$\frac{1}{3}$	$\frac{1}{3}$	0	
0	0	①	0	$\frac{2}{3}$	$\frac{1}{3}$	
0	1	0	$\frac{1}{9}$	0	$\frac{1}{9}$	 ①.
1	0	0	$\frac{1}{3}$	$-\frac{1}{3}$	$-\frac{1}{3}$	
0	0	1	0	$\frac{2}{3}$	$\frac{1}{3}$	



0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0	  $/ \cdot (-1) / \cdot \frac{1}{3}$
1	0	1	$\frac{1}{3}$	$\frac{1}{3}$	0	
0	0	①	0	$\frac{2}{3}$	$\frac{1}{3}$	
0	1	0	$\frac{1}{9}$	0	$\frac{1}{9}$	
1	0	0	$\frac{1}{3}$	$-\frac{1}{3}$	$-\frac{1}{3}$	
0	0	1	0	$\frac{2}{3}$	$\frac{1}{3}$	
1	0	0	$\frac{1}{3}$	$-\frac{1}{3}$	$-\frac{1}{3}$	

0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0	
1	0	1	$\frac{1}{3}$	$\frac{1}{3}$	0	
0	0	①	0	$\frac{2}{3}$	$\frac{1}{3}$	$/ \cdot (-1) / \cdot \frac{1}{3}$
0	1	0	$\frac{1}{9}$	0	$\frac{1}{9}$	← 2.
1	0	0	$\frac{1}{3}$	$-\frac{1}{3}$	$-\frac{1}{3}$	← 1.
0	0	1	0	$\frac{2}{3}$	$\frac{1}{3}$	
1	0	0	$\frac{1}{3}$	$-\frac{1}{3}$	$-\frac{1}{3}$	

0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0	  $/ \cdot (-1) / \cdot \frac{1}{3}$
1	0	1	$\frac{1}{3}$	$\frac{1}{3}$	0	
0	0	①	0	$\frac{2}{3}$	$\frac{1}{3}$	
0	1	0	$\frac{1}{9}$	0	$\frac{1}{9}$	← ②.
1	0	0	$\frac{1}{3}$	$-\frac{1}{3}$	$-\frac{1}{3}$	← ①.
0	0	1	0	$\frac{2}{3}$	$\frac{1}{3}$	
1	0	0	$\frac{1}{3}$	$-\frac{1}{3}$	$-\frac{1}{3}$	
0	1	0	$\frac{1}{9}$	0	$\frac{1}{9}$	

0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0	
1	0	1	$\frac{1}{3}$	$\frac{1}{3}$	0	
0	0	①	0	$\frac{2}{3}$	$\frac{1}{3}$	$/ \cdot (-1) / \cdot \frac{1}{3}$
0	1	0	$\frac{1}{9}$	0	$\frac{1}{9}$	← 2.
1	0	0	$\frac{1}{3}$	$-\frac{1}{3}$	$-\frac{1}{3}$	← 1.
0	0	1	0	$\frac{2}{3}$	$\frac{1}{3}$	← 3.
1	0	0	$\frac{1}{3}$	$-\frac{1}{3}$	$-\frac{1}{3}$	
0	1	0	$\frac{1}{9}$	0	$\frac{1}{9}$	

0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0	
1	0	1	$\frac{1}{3}$	$\frac{1}{3}$	0	
0	0	①	0	$\frac{2}{3}$	$\frac{1}{3}$	
<hr/>			<hr/>			$/ \cdot (-1) / \cdot \frac{1}{3}$
0	1	0	$\frac{1}{9}$	0	$\frac{1}{9}$	← 2.
1	0	0	$\frac{1}{3}$	$-\frac{1}{3}$	$-\frac{1}{3}$	← 1.
0	0	1	0	$\frac{2}{3}$	$\frac{1}{3}$	← 3.
<hr/>			<hr/>			
1	0	0	$\frac{1}{3}$	$-\frac{1}{3}$	$-\frac{1}{3}$	
0	1	0	$\frac{1}{9}$	0	$\frac{1}{9}$	
0	0	1	0	$\frac{2}{3}$	$\frac{1}{3}$	

0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0	
1	0	1	$\frac{1}{3}$	$\frac{1}{3}$	0	
0	0	①	0	$\frac{2}{3}$	$\frac{1}{3}$	

$/ \cdot (-1) / \cdot \frac{1}{3}$

0	1	0	$\frac{1}{9}$	0	$\frac{1}{9}$	← ②.
1	0	0	$\frac{1}{3}$	$-\frac{1}{3}$	$-\frac{1}{3}$	← ①.
0	0	1	0	$\frac{2}{3}$	$\frac{1}{3}$	← ③.

1	0	0	$\frac{1}{3}$	$-\frac{1}{3}$	$-\frac{1}{3}$
0	1	0	$\frac{1}{9}$	0	$\frac{1}{9}$
0	0	1	0	$\frac{2}{3}$	$\frac{1}{3}$

$$A^{-1} = \left[ \begin{array}{ccc} & & \end{array} \right]$$

0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0	
1	0	1	$\frac{1}{3}$	$\frac{1}{3}$	0	
0	0	①	0	$\frac{2}{3}$	$\frac{1}{3}$	$/ \cdot (-1) / \cdot \frac{1}{3}$
0	1	0	$\frac{1}{9}$	0	$\frac{1}{9}$	← 2.
1	0	0	$\frac{1}{3}$	$-\frac{1}{3}$	$-\frac{1}{3}$	← 1.
0	0	1	0	$\frac{2}{3}$	$\frac{1}{3}$	← 3.
1	0	0	$\frac{1}{3}$	$-\frac{1}{3}$	$-\frac{1}{3}$	
0	1	0	$\frac{1}{9}$	0	$\frac{1}{9}$	
0	0	1	0	$\frac{2}{3}$	$\frac{1}{3}$	

$$A^{-1} = \begin{bmatrix} \frac{1}{3} & -\frac{1}{3} & -\frac{1}{3} \\ \frac{1}{9} & 0 & \frac{1}{9} \\ 0 & \frac{2}{3} & \frac{1}{3} \end{bmatrix}$$

0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0	
1	0	1	$\frac{1}{3}$	$\frac{1}{3}$	0	
0	0	①	0	$\frac{2}{3}$	$\frac{1}{3}$	
						$/ \cdot (-1) / \cdot \frac{1}{3}$
0	1	0	$\frac{1}{9}$	0	$\frac{1}{9}$	
1	0	0	$\frac{1}{3}$	$-\frac{1}{3}$	$-\frac{1}{3}$	
0	0	1	0	$\frac{2}{3}$	$\frac{1}{3}$	
1	0	0	$\frac{1}{3}$	$-\frac{1}{3}$	$-\frac{1}{3}$	
0	1	0	$\frac{1}{9}$	0	$\frac{1}{9}$	
0	0	1	0	$\frac{2}{3}$	$\frac{1}{3}$	

$$A^{-1} = \begin{bmatrix} \frac{1}{3} & -\frac{1}{3} & -\frac{1}{3} \\ \frac{1}{9} & 0 & \frac{1}{9} \\ 0 & 0 & 1 \end{bmatrix}$$



0	1	$-\frac{1}{3}$	$\frac{1}{9}$	$-\frac{2}{9}$	0	
1	0	1	$\frac{1}{3}$	$\frac{1}{3}$	0	
0	0	①	0	$\frac{2}{3}$	$\frac{1}{3}$	
						$/ \cdot (-1) / \cdot \frac{1}{3}$
0	1	0	$\frac{1}{9}$	0	$\frac{1}{9}$	← ②.
1	0	0	$\frac{1}{3}$	$-\frac{1}{3}$	$-\frac{1}{3}$	← ①.
0	0	1	0	$\frac{2}{3}$	$\frac{1}{3}$	← ③.
1	0	0	$\frac{1}{3}$	$-\frac{1}{3}$	$-\frac{1}{3}$	
0	1	0	$\frac{1}{9}$	0	$\frac{1}{9}$	
0	0	1	0	$\frac{2}{3}$	$\frac{1}{3}$	

$$A^{-1} = \begin{bmatrix} \frac{1}{3} & -\frac{1}{3} & -\frac{1}{3} \\ \frac{1}{9} & 0 & \frac{1}{9} \\ 0 & \frac{2}{3} & \frac{1}{3} \end{bmatrix}$$