



COURSE ON MATRICES

LESSON 8

System of linear equations (Gaussian elimination)

Answers to Homework

Part 1: TEST

- 1) d
- 2) c
- 3) a
- 4) d
- 5) a
- 6) b
- 7) c
- 8) b
- 9) b
- 10) c

Part 2: ANSWERS TO EXERCISES

1)
$$\begin{cases} x = -1 \\ y = 5 \end{cases}$$

2) Inconsistent system

3)
$$\begin{cases} x = 2 \\ y = -1 \\ z = -3 \end{cases}$$

4)
$$\begin{cases} x = 1 \\ y = 1 \\ z = 1 \\ t = 1 \end{cases}$$

5) Inconsistent system

6)
$$\begin{cases} x = 2 - \alpha_1 \\ y = \alpha_1 \\ z = 1, \end{cases} \quad \alpha_1 \in \mathbb{R}$$

7)
$$\begin{cases} x = 3\alpha_1 + 1 \\ y = 2\alpha_1 \\ z = \alpha_1, \end{cases} \quad \alpha_1 \in \mathbb{R}$$

$$8) \begin{cases} x = 1 + 2\alpha_2 + \alpha_3 \\ y = 1 - \alpha_1 - 2\alpha_2 - \alpha_3 \\ z = \alpha_1 \\ t = \alpha_2 \\ v = \alpha_3, \end{cases} \quad \alpha_1, \alpha_2, \alpha_3 \in \mathbb{R}$$

$$9) \begin{cases} x = 1 \\ y = -\frac{1}{2} \\ z = -\frac{1}{2} \end{cases}$$

$$10) \begin{cases} x_1 = \frac{1}{2} + \frac{3}{2}\alpha_1 - \frac{1}{16}\alpha_2 \\ x_2 = \alpha_1 \\ x_3 = -\frac{11}{8}\alpha_2 \\ x_4 = \alpha_2, \end{cases} \quad \alpha_1, \alpha_2 \in \mathbb{R}$$

$$11) \begin{cases} x = 0 \\ y = 0 \\ z = 0 \\ t = \alpha_1 \\ u = \alpha_1, \end{cases} \quad \alpha_1 \in \mathbb{R}$$

12) Inconsistent system

$$13) \begin{cases} x = -\frac{6}{7} + \frac{8}{7}\alpha_1 \\ y = \frac{1}{7} - \frac{13}{7}\alpha_1 \\ z = \frac{15}{7} - \frac{6}{7}\alpha_1 \\ t = \alpha_1, \end{cases} \quad \alpha_1 \in \mathbb{R}$$

$$14) \begin{cases} x_1 = 1 \\ x_2 = 1 \\ x_3 = 1 \\ x_4 = 1 \\ x_5 = 2 \end{cases}$$

END