Exercise series N°04

Exercise 01:

Let the linear system of three unknowns x, y and z:

$$\begin{cases} x + y - 2z = -3 \\ -2x + y + z = 15 \\ 2x - y + 2z = 6 \end{cases}$$

1. Is this system, Cramer system? Justify.
2. Solve this system.

Exercise 02:

Solve the following linear system of four unknowns x, y, z and t:

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

Exercise 03:

Consider the following system:

$$\begin{cases} 2x + 6y - \alpha z = 2 \\ x - z = 1 \\ -x + 2y + z = 0 \end{cases}$$

1. Write this system in the form $AX = b$, with $X = \begin{pmatrix} x \\ y \\ z \end{pmatrix}$.
2. For which values of α, the matrix A of the system is regular, with $\alpha \in \mathbb{R}$.
3. If $\alpha = 4$
   a) Find the inverse of A.
   b) Solve the system.