

# Quiz 3 solution

February 14, 2020

## 1

we could transform this linear system into augmented matrix

$$\begin{bmatrix} 1 & 3 & -1 & 1 \\ 3 & 10 & 5 & 1 \\ 1 & 2 & -a^2 & a \end{bmatrix}$$

After row reduction we will get the echelon form

$$\begin{bmatrix} 1 & 3 & -1 & 1 \\ 0 & 1 & 8 & -2 \\ 0 & 0 & 9 - a^2 & 3 - a \end{bmatrix}$$

ps:

Q: For which a value will make this system inconsistent?

A: The system is inconsistent is equivalent to the system does not have any solution, which means that  $9 - a^2 = (3 - a)(3 + a) \neq 0$  while  $a - 3 = 0$ , which means that  $a = -3$  the system has no solution, i.e. inconsistent ; Besides, when  $a = 3$ , the system has infinity many solutions, and when  $a \neq \pm 3$ , the system has unique solution.

## 2

For this augmented matrix, we have the equivalent linear system

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

If we denote  $x_3 = t$ , then we arrive  $x_1 = 1 - t$  and  $x_2 = 1 + 2t$ . So the solution should be  $\{(1 - t, 1 + 2t, t), t \in R\}$