

Quiz 4

Consider the following Linear System. You are also given the reduced row echelon form of the system's augmented matrix. Use these two pieces of information to answer the questions below.

$$\begin{cases} x_1 + 2x_3 = 5 \\ 3x_1 - 6x_2 = 9 \\ x_2 + x_3 = 1 \end{cases} \quad \begin{bmatrix} 1 & 0 & 2 & 5 \\ 0 & 1 & 1 & 1 \\ 0 & 0 & 0 & 0 \end{bmatrix}$$

- a. (4 points) What is the solution of the linear system in parametric form?

$$\begin{cases} x_1 + 2x_3 = 5 \\ x_2 + x_3 = 1 \end{cases} \implies \begin{cases} x_1 = -2x_3 + 5 \\ x_2 = -x_3 + 1 \\ x_3 \text{ free} \end{cases}$$

- b. (4 points) What is the solution of the linear system in parametric vector form?

$$\begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} -2 \\ -1 \\ 1 \end{bmatrix} x_3 + \begin{bmatrix} 5 \\ 1 \\ 0 \end{bmatrix}$$

- c. (1 point) Are there any free variables?

yes ; its x_3

- d. (1 point) How many possible solutions are in the solution set of this linear system?

infinitely many