Q.1: Let $S = \{(x, y, x) | ax + by + cz = 0, a, b, c \text{ are real}\}$ be a subset of $\mathbb{R}^3$. Show that $S$ is a subspace of $\mathbb{R}^3$.

Q.2: Solve the linear system

\begin{align*}
x_1 - 2x_2 + x_3 &= 2 \\
3x_1 - x_2 + 2x_3 &= 5 \\
2x_1 + x_2 + x_3 &= 1
\end{align*}