

Q1) Find a 2×3 matrix X such that

$$\begin{bmatrix} 5 & 4 \\ 2 & 2 \end{bmatrix} X = \begin{bmatrix} 1 & 3 & -5 \\ -1 & -1 & 5 \end{bmatrix}.$$

Q2) Suppose that A is a square matrix with $A^2 = A$. Prove that $|A| = 0$ or $|A| = 1$.

Q3) Let V be the set of all (x, y, z) in \mathbb{R}^3 such that $x + y = 0$. Show that V is a subspace of \mathbb{R}^3 .

Q4) Let W be the set of all (x, y, z, t) in \mathbb{R}^4 such that $x + y = 3$. Verify that W is not a subspace of \mathbb{R}^4 .