Suppose \( W \) is the subset of \( \mathbb{R}^2 \) consisting of the \( x \) and \( y \) axes, so \( W = \{ \begin{bmatrix} x \\ y \end{bmatrix} : xy = 0 \} \) is the set of all points in \( \mathbb{R}^2 \) for which either the first coordinate is 0 or the second coordinate is 0 or both coordinates are 0.

A. Show that if \( \mathbf{u} \) is in \( W \), then any scalar multiple of \( \mathbf{u} \) is also in \( W \).

B. Give two specific vectors in \( W \) whose vector sum is not in \( W \).

C. Why is \( W \) not a subspace of \( \mathbb{R}^2 \)?