Q1. Let $S = \{[-1\ 2\ 1]^T, [3\ 1\ 2]^T, [1\ 5\ 4]^T, [-6\ 5\ 1]^T\}$. Does $[-5\ 3\ 0]^T$ belong to Span S

Q2. Let $S = \{[v_1\ v_2]^T \mid v_1 v_2 = 0\}$. Is S a subspace of $\Re^2$?

Q3. Let $W = \{p(x) \mid p \in P_4, p(2) = 0\}$. So W is the collection of all polynomials with degree less than or equal 4 whose graphs cross the x-axis at $x = 2$.
Is W a subspace of P_4 ?

Q4. Let $S = \{[x_1\ x_2]^T \mid x_1 \text{ and } x_2 \text{ are integers }\}$. Is S a subspace of $\Re^2$?

Q5. In M_{22} (the vector space of 2 X 2 matrices), let

$$S = \{\begin{bmatrix} 1 & 2 \\ 2 & 1 \end{bmatrix}, \begin{bmatrix} 2 & 1 \\ -1 & 2 \end{bmatrix}, \begin{bmatrix} 1 & 4 \\ 0 & 3 \end{bmatrix}, \begin{bmatrix} 0 & 1 \\ 1 & 2 \end{bmatrix}, \begin{bmatrix} 1 & 0 \\ 1 & 1 \end{bmatrix}\}$$

a) Determine if S Spans M_{22}
b) Determine if S is linearly independent.