Question 1: If all entries of a square matrix A are integers and $\det(A) = \pm 1$, show that all entries of A^{-1} are integers.

Question 4: Must a basis for P_n contain a polynomial of degree k for each $k=1,2,\ldots n$? Justify your answer and give an example.

Question 5: Prove: If S is a basis for a vector space V, then for any vectors u and v in V and any scalar k, the following relationships hold.

$$(u+v)S = (u)S + (v)S$$
$$(kv)S = k(v)S$$

Question 6: Show if the following set of vectors form basis.
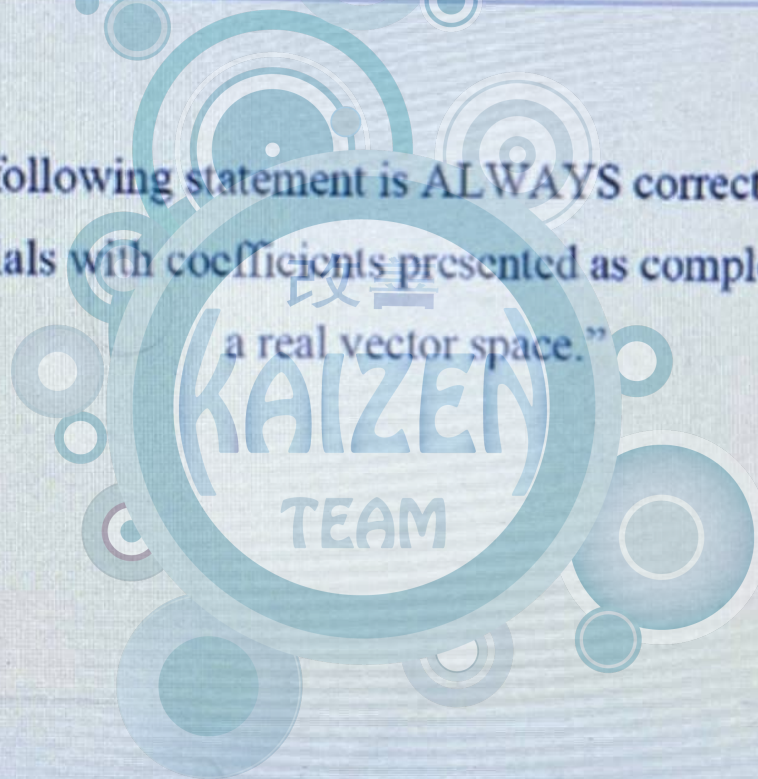
$$v_1 = (6, -3, 5)$$
$$v_2 = (2, 7, 5)$$
$$v_3 = (14, 6, 6)$$

Question 2: Show if the following statement is ALWAYS correct or not.

"The set of all polynomials with coefficients presented as complex numbers is considered as a real vector space."

Question 7: Assume that V consists of all vectors that are defined in R^3 and have the following form:

$$\begin{bmatrix} q+t \\ 2r-t \\ 3s+t \end{bmatrix}$$

where q. r. s and t are real numbers. Is V considered as a vector space or not.

Question 5: Assume that V consists of all vectors that are defined in R^2 and have the following form:

$$\begin{bmatrix} x \\ y \end{bmatrix}$$

Is V considered as a vector space or not when

    a. $y = x + 1$

    b. $y = x$

Question 2: Show if the following statement is ALWAYS correct or not.

"A determinant is linear as a function of each of its vector arguments."