A 5×6 matrix has 5 rows.

(A) True

(B) False

(C) I don't know

The matrix

$$\begin{bmatrix} 1 & 1 & 0 & 0 \\ 0 & 1 & 1 & 0 \\ 0 & 0 & 1 & 1 \end{bmatrix}$$

is in reduced echelon form.

(A) True

(B) False

(C) I don't know

A basic variable in a linear system is a variable that corresponds to a pivot column in the coefficient matrix.

(A) True

(B) False

(C) I don't know

If one row in an echelon form of an augmented matrix is

$$[0\ 0\ 0\ 5\ 0]$$

then the associated linear system is inconsistent.

(A) True

(B) False

(C) I don't know

If $\mathbf{w} = 3\mathbf{u} - 2\mathbf{v}$, then $\mathbf{w} \in \mathrm{Span}\{\mathbf{u}, \mathbf{v}\}$.

(A) True

(B) False

(C) I don't know

Suppose

$$A = \begin{bmatrix} 2 & 0 & 4 \\ 1 & -1 & -1 \\ 3 & 2 & 12 \end{bmatrix}$$

Then the set spanned by the columns of A

(A) Is empty

(B) Consists of three vectors

(C) Is a line through the origin in $\mathbb{R}^3$

(D) Is a plane through the origin in $\mathbb{R}^3$

(E) Is all of $\mathbb{R}^3$

(F) I don't know

If the product $A\mathbf{x}$ is a vector in $\mathbb{R}^4$, then

(A) A has four rows

(B) A has four columns

(C) $\mathbf{x}$ has four entries

(D) None of the above

(E) I don't know

The system $A\mathbf{x} = \mathbf{0}$ has a solution if and only if there is at least one free variable.

(A) True

(B) False

(C) I don't know

The set $\{\mathbf{v}_1, \mathbf{v}_2, \mathbf{0}\}$ is linearly dependent for any $\mathbf{v}_1, \mathbf{v}_2$ (assuming all vectors in the set are the same size).

(A) True

(B) False

(C) I don't know

The columns of

$$\begin{bmatrix} 0 & 2 & 2 \\ -1 & 3 & 2 \\ 2 & -2 & 0 \end{bmatrix}$$

are linearly independent.

(A) True

(B) False

(C) I don't know

The columns of

$$\begin{bmatrix} 13 & -17 & -14 & -15 & 6 & 11 & 8 & 13 & -3 \\ 17 & -9 & 19 & -3 & -19 & 10 & -19 & 8 & -5 \\ -15 & 2 & 19 & 17 & 14 & -4 & -9 & -7 & 11 \\ 17 & 19 & -1 & 12 & 18 & 6 & -19 & 18 & 12 \\ 5 & 19 & 12 & 19 & 7 & -13 & -17 & -19 & -13 \end{bmatrix}$$

are linearly independent.

(A) True

(B) False

(C) I don't know

Any linear transformation $T : \mathbb{R}^n \to \mathbb{R}^m$ can be written as $T(\mathbf{x}) = A\mathbf{x}$ for some $m \times n$ matrix A.

(A) True

(B) False

(C) I don't know

The transformation $T : \mathbb{R}^2 \to \mathbb{R}^3$ is defined by

$$T(\mathbf{x}) = \begin{bmatrix} 3 & 2 \\ 0 & -1 \\ 0 & 0 \end{bmatrix} \mathbf{x}$$

The range of T is equal to the codomain of T.

(A) True

(B) False

(C) I don't know

The transformation $T : \mathbb{R}^2 \to \mathbb{R}^3$ is defined by

$$T(\mathbf{x}) = \begin{bmatrix} 3 & 2 \\ 0 & -1 \\ 0 & 0 \end{bmatrix} \mathbf{x}$$

Then T is one-to-one.

(A) True

(B) False

(C) I don't know