(28) If the vector $\vec{u}$ is a linear combination of $\vec{v}$ and $\vec{w}$ then the vector $\vec{w}$ must be a linear combination of $\vec{u}$ and $\vec{v}$.

T F

if $\vec{u} = \vec{v} \neq \vec{w}$

(29) If matrices A and B and both invertible then the matrix $A + B$ must be invertible too.

T F

$I_n = A \quad B = -I_n$

$A + B = 0$

(30) The vectors of the form $\begin{bmatrix} a \\ b \\ 0 \\ a \end{bmatrix}$ (where a and b are arbitrary real numbers) form a subspace of $\mathbb{R}^4$.

T F

contain 0 can add & mult.

(31) There exists a 2×2 matrix A such that $A \begin{bmatrix} 1 \\ 1 \end{bmatrix} = \begin{bmatrix} 1 \\ 2 \end{bmatrix}$ and $A \begin{bmatrix} 2 \\ 2 \end{bmatrix} = \begin{bmatrix} 2 \\ 1 \end{bmatrix}$.

T F

$A\binom{2}{2} = 2A\binom{1}{1} = 2\binom{1}{2} \neq \binom{2}{4}$

(32) There is a matrix A such that $A \begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix} = \begin{bmatrix} 1 & 2 \\ 1 & 2 \end{bmatrix}$.

T F

$A\begin{pmatrix} 1 & 1 \\ 1 & 1 \end{pmatrix} = \left(A\binom{1}{1}, A\binom{1}{1}\right)$

(33) If a subspace V of $\mathbb{R}^n$ contains none of the standard vectors $\vec{e}_1, \vec{e}_2, \ldots, \vec{e}_n$ then V consists of the zero vector only.

T F

try $k\binom{1}{1}$

(34) If A and B are any two 3×3 matrices of rank 2 then A can be transformed into B by means of elementary row operations.

T F

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

(35) $\begin{bmatrix} 1 & k \\ 0 & 1 \end{bmatrix}^3 = \begin{bmatrix} 1 & 3k \\ 0 & 1 \end{bmatrix}$ for all real numbers k.

T F

multiply

(36) If a subspace V of $\mathbb{R}^3$ contains the standard vectors $\vec{e}_1, \vec{e}_2$, and $\vec{e}_3$ then V must be $\mathbb{R}^3$.

T F

because e_i span R^3