(37) If A is a 4×3 matrix then there exists a vector $\vec{b}$ in $\mathbb{R}^4$ such that the system $A\vec{x} = \vec{b}$ is inconsistent.

T F Dim of Image is 3 not 4

(38) There is an invertible $n \times n$ matrix with two identical rows.

T F 2 rows same give rank < n

(39) If $\vec{v}_1, \vec{v}_2$, and $\vec{v}_3$ are any 3 vectors in $\mathbb{R}^3$ then there must be a linear transformation T from $\mathbb{R}^3$ to $\mathbb{R}^3$ such that $T(\vec{v}_1) = \vec{e}_1$, $T(\vec{v}_2) = \vec{e}_2$ and $T(\vec{v}_3) = \vec{e}_3$.

T F if $v_i = 0$

(40) If A is a 4×3 matrix of rank 3 and $A\vec{v} = A\vec{w}$ for two vectors $\vec{v}$ and $\vec{w}$ in $\mathbb{R}^3$ then the vectors $\vec{v}$ and $\vec{w}$ must be equal.

T F $A(v-w)=0$ - so $v-w=0$

(41) If A and B are two 4×3 matrices such that $A\vec{v} = B\vec{v}$ for all vectors $\vec{v}$ in $\mathbb{R}^3$ then the matrices A and B must be equal.

T F if $v = \vec{e}_i$ Ae_i is ith colum so all col same

(42) If V is any 3-dimensional subspace of $\mathbb{R}^5$ then V has infinitely many bases.

T F True for any 3 dim space.

(43) If $A = \begin{bmatrix} \vec{u} & \vec{v} & \vec{w} \end{bmatrix}$ and $\mathrm{rref}(A) = \begin{bmatrix} 1 & 0 & 2 \\ 0 & 1 & 3 \\ 0 & 0 & 0 \end{bmatrix}$ then the equation $\vec{w} = 2\vec{u} + 3\vec{v}$ must hold.

T F row operat don't chang colum relats

(44) The formula $(A\vec{v}) \cdot (A\vec{w}) = \vec{v} \cdot \vec{w}$ holds for all invertible 2×2 matrices A and for all vectors $\vec{v}$ and $\vec{w}$ in $\mathbb{R}^2$.

T F A doesn't have to take $\perp$ vectors to $\perp$ vecto.

(45) If $\vec{v}_1, \vec{v}_2, \ldots, \vec{v}_n$ and $\vec{w}_1, \vec{w}_2, \ldots, \vec{w}_n$ are two bases of $\mathbb{R}^n$ then there is a linear transformation T from $\mathbb{R}^n$ to $\mathbb{R}^n$ such that $T(\vec{v}_1) = \vec{w}_1, T(\vec{v}_2) = \vec{w}_2, \ldots, T(\vec{v}_n) = \vec{w}_n$.

T F what happens to a basis defin the L.T.