Map of LA

A is an $n \times n$ matrix

$$T_{\mathbf{A}} : \mathbf{R}^n \to \mathbf{R}^n$$

A is invertible	chapter 2	**A is not invertible**
det A $\neq$ 0	chapter 2	**det A = 0**
rref of A is identity matrix	chapter 1	**rref of A has a zero row**
AX= 0 has only the trivial solution	chapter 1	**AX= 0 has non-trivial solutions**
AX= b has a unique solution	chapter 1	**AX= b has no solution or infinitely many solutions**
rows (columns) of A are linearly independent	chapter 3	**rows (columns) of A are linearly dependent**
nullity(A) = 0 rank(A) = n	chapter 4	**rank(A) < n nullity(A) > 0**
0 is not an eigenvalue of A	chapter 6	**0 is an eigenvalue of A**
R(T$_A$) = R^n	chapter 7	**R(T$_A$) $\neq$ R^n**