Provide a counterexample to justify each of the following false statements.

1. Two matrices are row equivalent if they have the same number of rows.

2. An inconsistent system has more than one solution.

3. If one row in an echelon form of an augmented matrix is $\begin{bmatrix} 0 & 0 & 0 & 5 & 0 \end{bmatrix}$, then the associated linear system is inconsistent.

4. If an augmented matrix $[A \quad \vec{b}]$ can be transformed by elementary row operations into reduced echelon form, then the equation $A\vec{x} = \vec{b}$ is consistent.

5. Whenever a system has free variables, the solution set contains many solutions.