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

6. If a system of linear equations has no free variables, then it has a unique solution.

7. The equation  $A\vec{x} = \vec{0}$  has the trivial solution if and only if there are no free variables.

8. The equation  $A\vec{x} = \vec{b}$  is consistent if the augmented matrix  $\begin{bmatrix} A & \vec{b} \end{bmatrix}$  has a pivot position in every row.

9. If the augmented matrix  $\begin{bmatrix} A & \vec{b} \end{bmatrix}$  has a pivot position in every row, then the equation  $A\vec{x} = \vec{b}$  is inconsistent.

10. If  $\vec{x}$  is a nontrivial solution of  $A\vec{x} = \vec{b}$ , then every entry in  $\vec{x}$  is nonzero.