Determine whether the statements that follow are true or false, and justify your answer.

- (i) A system of four linear equations in three unknowns is always inconsistent.
- (ii) If matrix A is in reduced row-echelon form, then at least one of the entries in each column must be 1.
- (iii) If matrix E is in reduced row-echelon form, and if we omit a column of E, then the remaining matrix must be in reduced row-echelon form as well.
- (iv) If A and B are any two $n \times n$ matrices of rank n, then A can be transformed into B by means of elementary row operations.

(v) If
$$ad - bc \neq 0$$
, then the matrix $\begin{bmatrix} a & b \\ c & d \end{bmatrix}$ must have rank 2.

(vi) The rank of any upper triangular matrix is the number of nonzero entries on its diagonal.

(vii) There exists a 2×2 matrix A such that $A \begin{bmatrix} 1 \\ 2 \end{bmatrix} = \begin{bmatrix} 3 \\ 4 \end{bmatrix}$.