Two linear systems are **equivalent** provided that
A. They have the same number of equations and unknowns
B. They are both consistent
C. They have the same solution set
D. Their augmented matrix are in the reduced row echelon form (rref)
E. They both have a unique solution
Question 2

Which of the following matrix is not in row echelon form (ref)?

A. $$\begin{bmatrix} 1 & 3 & -1 & 1 \\ 0 & 3 & -1 & 3 \\ 0 & 0 & 0 & -2 \end{bmatrix}$$

B. $$\begin{bmatrix} 1 & 0 & 0 & -1 \\ 0 & 1 & 0 & 3 \\ 0 & 0 & 1 & -2 \end{bmatrix}$$

C. $$\begin{bmatrix} 1 & 3 & -1 & 3 \\ 0 & 1 & 0 & -1 \\ 0 & 1 & 0 & 0 \end{bmatrix}$$

D. $$\begin{bmatrix} 0 & 1 & 3 & -1 \\ 0 & 0 & 0 & -1 \\ 0 & 0 & 0 & 0 \end{bmatrix}$$

E. Both (C) and (D)
Consider a linear system whose augmented matrix is row equivalent to

\[
\begin{bmatrix}
1 & -2 & -3 & -4 & 0 & 6 \\
0 & 0 & 3 & 4 & 5 & 0 \\
0 & 0 & 0 & 0 & 5 & -6
\end{bmatrix}.
\]

Assuming the variable \( x_i \) corresponds to the \( i \)-th column. Which of the following are free variable?

A. \( x_2 \) only
B. \( x_2 \) and \( x_4 \)
C. \( x_1 \) and \( x_3 \)
D. \( x_2, x_4, \) and \( x_6 \)
E. \( x_1, x_3, \) and \( x_5 \)
Consider a linear system whose augmented matrix is row equivalent to

\[
\begin{bmatrix}
1 & 2 & 3 & 4 \\
0 & 1 & 2 & 3 \\
0 & 0 & 1 & 2 \\
0 & 0 & 0 & 1 \\
\end{bmatrix}
\]

Which of the following best describes the number of solutions of the system?

A. No solution
B. A unique solution
C. Infinitely many solutions
D. Not enough info to decide
Consider a linear system whose **augmented** matrix is row equivalent to

\[
\begin{bmatrix}
1 & 2 & 3 & 4 \\
0 & 1 & 2 & 3 \\
0 & 0 & 1 & 2 \\
0 & 0 & 0 & 0 \\
\end{bmatrix}.
\]

Which of the following **best** describes is the number of solution of the system?

A. No solution
B. A unique solution
C. Infinitely many solutions
D. Not enough info to decide
Consider a linear system whose coefficient matrix is row equivalent to
\[
\begin{bmatrix}
1 & 2 & 3 & 4 \\
0 & 1 & 2 & 3 \\
0 & 0 & 1 & 2 \\
0 & 0 & 0 & 1 \\
\end{bmatrix}
\]

Which of the following best describes is the number of solution of the system?

A. No solution
B. A unique solution
C. Infinitely many solutions
D. Not enough info to decide