NAME:

1. Consider the following matrix:
$$\mathbf{A} = \begin{pmatrix} 1 & 3 & 2 \\ 0 & 1 & 4 \\ 0 & 0 & 1 \end{pmatrix}$$

   (a) Find $\mathbf{A}^{-1}$

   (b) Use $\mathbf{A}^{-1}$ to find $\mathbf{X}$ that satisfies: $\mathbf{AX} = \begin{pmatrix} 1 \\ 1 \\ 1 \end{pmatrix}$

2. Consider the following matrix:
$$\mathbf{A} = \begin{pmatrix} 7 & 8 & 9 \\ 1 & 2 & 3 \\ 4 & 5 & 6 \end{pmatrix}$$

   (a) Find $|\mathbf{A}| = \det(\mathbf{A})$. (Hint: Use ERO to simplify)

   (b) Determine if $\mathbf{A}$ is singular or nonsingular.

   (c) Does system $\mathbf{AX} = \mathbf{0}$ have trivial or nontrivial solutions?

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   (b) Use $\mathbf{A}^{-1}$ to find $\mathbf{X}$ that satisfies: $\mathbf{AX} = \begin{pmatrix} 1 \\ -1 \\ 1 \end{pmatrix}$

2. Consider the following matrix:
$$\mathbf{A} = \begin{pmatrix} 1 & 4 & 7 \\ 2 & 5 & 8 \\ 3 & 6 & 9 \end{pmatrix}$$

   (a) Find $|\mathbf{A}| = \det(\mathbf{A})$. (Hint: Use ERO to simplify)

   (b) Determine if $\mathbf{A}$ is singular or nonsingular.

   (c) Does system $\mathbf{AX} = \mathbf{0}$ have trivial or nontrivial solutions?